MONTANA GRADE 2 MATHEMATICS STANDARDS EXPANDED GUIDANCE

MONTANA OFFICE OF PUBLIC INSTRUCTION (OPI)

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INTRODUCTION TO THE MONTANA GRADE 2 MATHEMATICAL PRACTICE AND CONTENT STANDARDS

This document provides specific guidance for understanding and implementing the Montana Standards for Mathematical Practices and Mathematics Content at the **Grade 2 level**. Adopted in 2025 and implemented in 2026, these standards are designed to build a strong foundation in mathematics for young learners, developing their readiness for college, career, and community engagement. The Standards for Mathematics Content do not dictate curriculum, or pedagogy, but rather drive curriculum creation. These grade 2 standards, as part of the K-12 standards, define end-of-year expectations and a cumulative progression designed to enable students to meet college and career readiness expectations no later than the end of high school. (Administrative Rule 10.53.101)

The Montana Mathematics Standards also reflect the constitutional mandate to provide instruction that includes the distinct and unique heritage and contemporary contributions of American Indians in a culturally responsive manner (Montana Constitution Article X Section 1(2) and statutes §20-1-501 and §20-9-309 2(c), MCA). This allows students to recognize and respect the historical and contemporary manifestations of mathematical knowledge across the unique cultures of Montana's 12 federally recognized tribes, ensuring that the teaching of mathematics in Montana integrates cultural understanding, respect, and relevance for all Montana students.

Purpose of this Document

This document serves as a primary guide for those in Montana working to align mathematics education across grade 2. This **grade 2-specific** guidance document aims to:

- Clarify the purpose and goals of the Montana Standards for grade 2 mathematics.
- Provide an overview of the standards for educators, families, students, and others invested in grade 2 mathematics education.
- Offer general notes as well as instructional, IEFA integration, and proficiency rubric examples to support the practical application of the standards in a grade 2 context.

*For K-12 or alternate grade level support, please refer to the **K-12 guidance document** or relevant **expanded grade-level specific guidance documents**, which outline special considerations, examples, and elaborations by grade.*

Frequently Asked Questions - Navigating the Grade 2 Standards

What are standards?

Content standards define the knowledge or skills that every student should know and be able to do at the conclusion of a particular grade level or program. Montana's mathematics content standards begin with kindergarten and continue through twelfth grade.

In addition, Montana includes K–12 mathematical **practice standards**, which guide the development of critical thinking, reasoning, and problem-solving abilities in age-appropriate ways throughout students' educational journeys. Combined, the content and practice standards are designed to equip students with the mathematical skills necessary for success in adulthood, career pathways, and post-secondary education, developing universal abilities that extend far beyond the classroom.

Students grow into informed thinkers who can analyze complex problems, make data-driven decisions, and contribute meaningfully to society through mastering both the knowledge from content standards and the habits of mind fostered by mathematical practices. These skills prepare students to navigate challenges in their personal lives, pursue diverse opportunities, and participate as active, thoughtful citizens in a rapidly evolving world.

How should the coding scheme be read and understood?

The Montana mathematics content standards use a structured coding system to help educators, schools, and invested parties efficiently locate individual standards within the general framework. While the coding structure is consistent across K-12, there are slight variations between the K-8 and high school (9-12) standards to reflect the additional organization components relevant to the organization of the high school standards.

Elements across Grade 2 Standards

All grade 2 standards follow a coding scheme that includes the following elements:

1. **State indicator: MT**
   Every Montana mathematics content standard begins with the MT designation, signifying that the standard is unique to the state of Montana and reflects the standards Montana has codified within its Administrative Rules.

2. **Grade Level: 2**
   This element identifies the grade level of the standard. Grade 2 is indicated by **"2."**

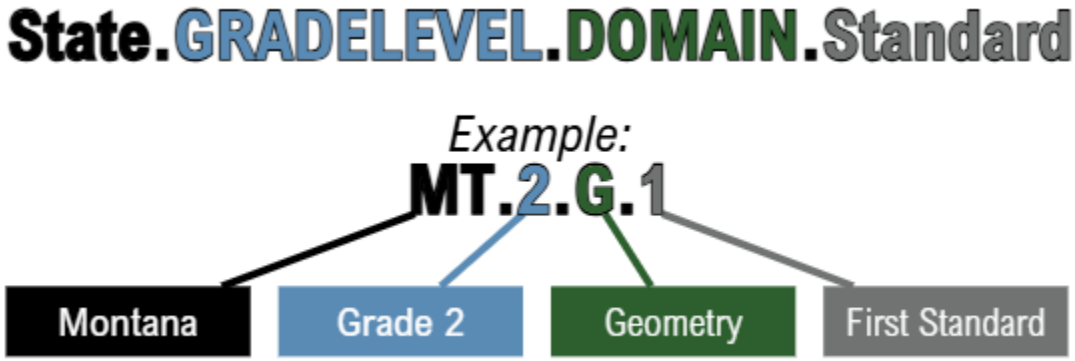
3. **Domain: Abbreviated Representation**
   Each standard is categorized within a domain, represented by a short abbreviation. A **domain** within the grade 2 content standards for mathematics is a **broad organizational category** that groups related standards around a key mathematical concept or set of concepts (REL Southeast, 2020). Domains support the organizational structure and also help illustrate the progression of mathematical ideas across grade

levels. Domains across grade 2 standards include Operations and Algebraic Thinking (AO), Numbers and Operations in Base Ten (NBT) Measurement and Data (MD), and Geometry (G).

4. **Standard Item: Number**
   This element specified the standard's sequence within a particular domain.

Grade 2 Coding Scheme Exemplar

For K-8 Standards, the structure follows the sequence **MT [Grade Level] [Domain] [Standard Number]**, illustrated in the figure provided:



Key Considerations for Grade 2 Mathematics Learning

The Importance of Math in Early Learning

Mathematics in early elementary lays the foundation for success in later grades. It helps children develop critical thinking, problem-solving skills, and a sense of curiosity about the world around them. Early exposure to math also fosters confidence and a positive attitude toward learning and mathematical thinking.

Research provided by the Regional Education Laboratory (REL) to the writing team during the standards revision process shaped the revisions to the mathematics content standards. This research can be reviewed in full in the REL Handout A. Key areas of emphasis from this research include:

- **Essential Content Areas:** Key foundational skills include counting with 1-to-1 correspondence, subitizing (recognizing small quantities without counting), understanding place value, and early algebraic thinking. These skills are critical for later mathematical success.

- **Instructional Strategies:** Effective practices include the use of learning progressions, play-based activities, and a balance between teacher-directed and student-centered learning. Multiple representations, such as visual aids and manipulatives, help students move from concrete to abstract thinking.

The Importance of Cultural Relevance

In alignment with Montana's constitutional mandate and evidence-based research, this document encourages incorporating culturally responsive teaching practices. Educators are encouraged to include examples and activities that reflect the heritage and contributions of Montana's Indigenous Peoples, as well as other diverse global and local cultures, to make mathematics meaningful for all students.

Research provided by the Regional Education Laboratory (REL) to the writing team during the standards revision process shaped the revisions to the mathematics content standards. This research can be reviewed in full in the REL Handout A and REL Handout B. Key areas of emphasis from this research include:

- **Cultural Relevance:** REL Handout A recommends incorporating cultural diversity into early math instruction to build students' mathematical identity and appreciation for diversity. However, more research is needed to explore how culturally relevant pedagogy impacts early childhood math education.

- **Practice Considerations:** REL Handout B highlights the process (practice) standards as a methodology to address diverse learners' needs. In particular, culturally relevant pedagogy and social-emotional supports are recommended for teaching mathematics in all communities. The literature indicates that more research is required in this area.

NCTM Position Statement on Mathematics in Early Childhood Learning:

The National Council of Teachers of Mathematics released the following position statement regarding Mathematics in Early Childhood Learning in November 2022:

> *"Early childhood learning lays the foundation for a child's mathematical journey. Young children flourish when supported in rich learning environments; yet access and outcome vary significantly by social identities. To approach early childhood learning through the lens of equity requires the early childhood education system to acknowledge that the disenfranchisement and discrimination faced by young children, their families, and early childhood educators are systemic. Equitable early childhood education demands culturally and linguistically responsive teaching; developmentally expansive and inclusive practices that respect diversity and value all children's strengths; and the voices of caregivers, families, educators, and children elevated in the decision-making process. Such practices in turn require that early childhood teachers have the support of policies, organizational structures, and resources that enable them to succeed in this challenging and important work."*

To ensure that all children have access to mathematics learning opportunities, they recommend that educators of young students engage in the following practices:

- Capitalize on the wonder and joy children naturally bring to their mathematical learning and their observations of the world.
- Use curriculum and teaching practices that build and strengthen children's problem-solving and reasoning.
- Accept and appreciate that all children have rich and diverse cultural, linguistic, home, community, and lived experiences on which to build mathematics learning.
- Build partnerships and opportunities for collaboration with students, families, community leaders, and policymakers to address barriers to educational attainment.
- Develop systems of reflective practice across affected parties for equitable access to early care and childhood mathematics learning opportunities. (NCTM, 2022).

MONTANA K-12 MATHEMATICAL PRACTICE STANDARDS

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in all students. These practices are rooted in fundamental **processes and proficiencies** that have long been central to effective mathematics instruction.

As part of the revision process for Montana's mathematics standards and practices, the revision task force reviewed research compiled by the Regional Education Laboratory (REL) Northwest (see Appendix X: References). This analysis found that the eight mathematical practices adopted by Montana in 2011 – originating from the 2006 NAEP Mathematics framework developed by the National Assessment Governing Board (NAGB) and were later incorporated into the Common Core State Standards – no longer fully reflected current research and instructional standards.

The 2026 NAEP Mathematics framework integrates recent research on cognitive development, instructional practices, and evolving mathematical needs in a rapidly increasing data- and mathematics-reliant society, offering a clearer vision of the skills students need to understand and apply mathematics in relevant contexts (NAGB, 2022). The task force examined this framework while recognizing the need for a more modern and comprehensive framework that reflects the unique needs of Montana learners.

While the five mathematical practices outlined in the NAEP framework provided valuable skills for Montana students, the task force determined that a full adoption would not adequately address the diverse needs of Montana's learners. Instead, they recommended revising Montana's mathematical practices to reflect both national research-based best practices and state-specific educational priorities. The revision aimed to preserve alignment with the language and intent of the NAEP practices while ensuring that Montana's students develop mathematical habits that are relevant to their unique cultural, educational, and career trajectories.

Therefore, Mathematical Practices numbered 2 through 6 have been adapted from the NAEP Framework. These practices emphasize a deep understanding of mathematical thinking reflecting decades of efforts to define higher-order reasoning, problem-solving, and mathematical communication (NAGB, 2022). Additionally, Mathematical Practices 1 and 7 were developed to reflect specific priorities identified by Montana educators, ensuring that the state's mathematical practices are both research-informed and responsive to the needs of Montana's students and communities.

What is a Mathematical Practice Standard?

A **mathematical practice standard** is a specific statement that defines the **how** of student engagement in mathematical reasoning, problem-solving, communication, and collaboration (Harbin, Miles, & Williams, 2016). These standards describe expertise that mathematics educators at all levels should seek to develop in their students to support proficiency in mathematical thinking. Mathematical practice standards focus on the **processes and practices** students use to apply their mathematical knowledge flexibly, accurately, and efficiently across a variety of applications and scenarios (Harbin, Miles, & Williams, 2016). Designers of curricula, assessments, and professional development should connect the mathematical practices to mathematics content.

In addition to stating each of Montana's Practice Standards, the following section provides an example proficiency rubric, identifies key skills, special considerations for grade 2, and elements of rich mathematical practice learning tasks, and offers suggestions for how adults might support students in acquiring these skills.

Proficiency in Mathematical Practice Standards

Embedding mathematical practices within instructional activities can enhance and enrich mathematical learning. These skills support mathematical learning and, as a result, it can be challenging to assess students' proficiency in isolation. Educators should take special care when assessing students on these standards. Assessment can occur in a variety of contexts, including student observations during class activities, student self-assessments, projects or performance tasks, and student portfolios. Clear rubrics and proficiency scales can help educators accurately determine students' proficiency in the Mathematical Practice Standards.

Notes on Proficiency:

- Proficiency means a student can consistently show they understand and can apply a skill or concept in different situations, without needing extra help. It's about meeting the learning goal with confidence and accuracy.
- These targets are often broken into measurable criteria that describe what mastery looks like for a particular skill or concept.

- Proficiency is demonstrated through evidence of learning, such as assessments, projects, or performances that align directly with the standard.
- There are differing views on the quality versus quantity of evidence for mastery. Some resources argue that a single demonstration of mastery suffices, while others argue that mastery should be established through multiple assessments. Districts are encouraged to explore and adopt the methodology across classrooms that aligns with their pedagogical philosophy and instructional practice. Engaging in discussions at the local level about district and educator preferences greatly benefits students, educators, and families.

Example Proficiency Rubric:

When determining students' proficiency in a mathematical practice, it may be useful to utilize a proficiency rubric, such as the one provided below:

Beginning	Developing	Proficient	Mastery
The student shows minimal understanding or requires significant support.	The student demonstrates partial understanding but has not yet mastered each skill. The student may be able to independently engage in some skills but may require support in others. It may also be the case that the student requires minimal support across multiple skills.	The student is able to engage in each of the skills identified in the mathematical practice with independence and accuracy in developmentally appropriate ways.	The student is able to engage in the skills identified in the mathematical practice in or beyond developmentally appropriate ways. They are able to engage in this mathematical practice in connection with other mathematical practices or content standards. The student exceeds the standard, showing deeper understanding or application.

Achieving proficiency indicates that a student is ready to move on to the next level of learning. It is important to note that, as the practice standards span the K-12 experience, the next level of learning may include applying the mathematical practice to new content standards, or in new developmentally appropriate ways such as utilizing age-appropriate methodologies for proving in upper grade levels.

Mathematical Practice Standard 1 – Problem-Solve and Persevere:

Mathematically proficient students:

- ***Make conjectures, plan, and follow solution strategies;***
- ***Evaluate their progress and accuracy;***
- ***Engage in sense-making and self-monitoring; and***
- ***Persevere in seeking solutions and value alternative approaches.***

Embedded Skills:

To be considered proficient in this mathematical practice standard, students should be able to demonstrate each of the following skills in developmentally appropriate ways:

- ✓ Make conjectures
- ✓ Make a plan
- ✓ Follow solution strategies
- ✓ Evaluate their progress and accuracy
- ✓ Engage in sense-making
- ✓ Engage in self-monitoring
- ✓ Persevere in seeking solutions
- ✓ Value alternative approaches

Skills Timeline:

Students may engage in these skills at the following intervals of the solving process:

Before solving, students will be able to:	During solving, students will be able to:	After solving, students will be able to:
✓ Make conjectures	✓ Follow solution strategies	✓ Evaluate their progress and accuracy
✓ Make a plan	✓ Evaluate their progress and accuracy	✓ Engage in self-monitoring
✓ Engage in sense-making	✓ Engage in sense-making	✓ Value alternative approaches
	✓ Engage in self-monitoring	
	✓ Persevere in seeking solutions	

Grade 2 Applications:

Grade 2 students are developing increased independence as mathematical problem solvers, relying less on explicit teacher guidance and more on foundational knowledge, adaptive reasoning, and strategic competence. When faced with a task, they begin by reading carefully, making sense of the situation, and deciding what the problem is asking them to do. They are learning how to make simple conjectures (mathematical hypotheses), form plans for solving, and how to follow strategies. At this stage of mathematical development, students continue to rely on concrete tools (e.g., counters, base-ten blocks, fingers, etc.) and pictorial representations (e.g., drawings, simple graphs, diagrams, etc.). They gradually incorporate more abstract reasoning as they advance their mathematical proficiency. When testing ideas, monitoring progress, or evaluating whether their solutions make sense, they will often lean on concrete and pictorial reasoning for support. Grade 2 students are encouraged to persevere through challenges, particularly when solutions are not immediately obvious. They can engage in this behavior by trying alternative approaches, refining their plan, or engaging supportive representations. Productive struggle remains essential to students' ability to problem-solve and persevere and is supported by teacher questioning, modeling, and encouragement. Through these experiences, second grade students can begin to cultivate positive dispositions toward problem-solving, learn to value multiple approaches, and recognize that tenacity and reasoning can foster success.

Key Elements of a Rich Problem-Solve and Persevere Task:

Learning tasks that engage students in problem-solving and persevering may have some or all the following characteristics:

- **Open-Ended:** Tasks encourage students to engage in deep thinking, reasoning, and discussion rather than reliance on a single procedure to reach a predefined answer. Teachers might provide activities like solving puzzles, patterns, number or data talks, or building structures that allow students to explore using different strategies. **Grade 2** students are provided opportunities to engage with problems that have multiple solutions or strategies, applications to contextual situations, and require the utilization of tools to support creative thinking to promote curiosity in mathematics.
- **Conjecture:** Tasks require students to form conjectures about mathematical observations and ideas. Teachers might prompt students to predict outcomes before starting, such as asking, "What do you think will happen if we do this?" or "What do you observe might be happening?" **Grade 2** students guess or predict outcomes based on observations and are beginning to reason abstractly. For example, they might form conjectures about data within four categories, such as forming a hypothesis around which type of pet is most popular among second graders based on the comparative size of bars presented in a bar graph.
- **Plan-Making:** Learning activities may require students to consider how they will approach a problem without providing explicit direction. Teachers may ask questions such as, "How can we begin?", "What strategies do you think will work?", and "Can we use strategies from similar problems we have completed before?" **Grade 2** students will be expected to make a plan and follow through with it. For example, they may decide to use place value to solve a subtraction problem instead of using an alternative strategy, such as counting on, writing the problem as an unknown addend, or using a number line.
- **Critical Reflection:** Tasks facilitate students' careful thinking about whether the information they have, their chosen approach, the steps they take, or their final answer are logical. Students are encouraged to keep reflecting during the problem-solving process, which supports

understanding and self-checking. **Grade 2** students can demonstrate understanding by describing why they chose a certain strategy, engaged in certain steps, or knew their answer made sense. For example, students may explain how they solved an addition or subtraction problem involving data by describing the observations they made or strategies they used to evaluate.

- **Perseverance Through Challenges:** Learning activities include obstacles or setbacks, encouraging students to try different methods. Teachers may support this by asking questions such as "When you're ready to try again, what might you do differently?" When faced with adversity or mistakes, **Grade 2** students attempt new approaches such as using flexible methods to add or subtract instead of continuing to try a strategy that isn't working for them. They may also choose to engage visual aids to support their understanding, such as drawing a picture without prompting.
- **Multiple Solution Paths:** Learning activities have more than one correct approach, enabling students to find different starting points. This encourages creativity and exploration, while also showing that math is a process that can develop over time, and there are often many correct ways to approach a problem. Teachers might encourage this by challenging students to think about alternative approaches or asking students to share diverse ways of solving aloud. **Grade 2** students may be provided with opportunities to solve a problem or draw a conclusion in ways that may vary from their classmates, while still seeking the correct answer. For instance, when solving an addition or subtraction problem within 100, students might choose the draw base-ten representations, use place value reasoning, or apply mental strategies such as making a ten.
- **Opportunities for Reflection:** Tasks include moments for students to assess their progress. Educators may ask questions such as, "How did you solve this?", "What could you try next?", or "Does your answer make sense?" and offer opportunities for students to consider their progress and whether their solutions made sense and were appropriate for the circumstances. In **grade 2**, students begin to take increased ownership of their reasoning and are capable of considering whether strategies were efficient and aligned with the context of the problem. Second graders might reflect by checking their work, comparing strategies, or using tools and representations that could clarify reasoning. For example, when solving problems within 100 in contexts involving lengths, students may use different strategies such as drawing a diagram, using a number line, or subtracting with place value reasoning. After finding a difference, students might reflect by asking questions such as: "Does my answer make sense here?", "If I add my answer back, do I get the original value?", or "Does my diagram match the story?"

Ways Adults Can Support Students in Learning to Problem-Solve and Persevere:

Some ways adults can support students in developing their problem-solving and persevering skills include:

- **Model Problem-Solving and Perseverance Behaviors:** Demonstrate how to think aloud while solving a problem, such as saying, "I'm not sure this will work, so I'll try another way." Demonstrate perseverance by speaking about things that are challenging for you, for instance, "I'm not quite sure how to do this yet, and I am getting frustrated. I'll take a break and try again when I am ready."
- **Encourage Perseverance:** At this stage, it is important for the adult to support and encourage the child, congratulating them on their hard work, persistence, and creativity in problem solving, rather than reserving praise for when the student discovers the correct answer.

- **Ask Open-Ended Questions:** Use prompts like "What do you think will happen if you try this?" or "Can you show me another way to solve the problem?" in a variety of contexts, including mathematical ones.
- **Provide Tools and Resources:** Offer manipulatives (e.g., number counters, blocks, ten frames, grid paper, etc.), drawings, or other concrete materials to help students explore solutions.
- **Create a Safe Environment:** Foster an atmosphere where mistakes are seen as opportunities to learn, reassuring students that it's okay to try again.

Mathematical Practice Standard 2 – Abstract and Generalize:

Mathematically proficient students are able to decontextualize and symbolically represent both mathematical and non-mathematical situations to search for and analyze regularities, patterns, and structures.

Embedded Skills:

To be considered proficient in this mathematical practice standard, students should be able to demonstrate each of the following skills in developmentally appropriate ways:

- ✓ Decontextualize mathematical and non-mathematical situations
- ✓ Symbolically represent mathematical and non-mathematical situations
- ✓ Search for regularities, patterns, and structures
- ✓ Analyze regularities, patterns, and structures

Skills Timeline:

Students may engage in these skills at the following intervals of the solving process:

Before solving, students will be able to:	During solving, students will be able to:	After solving, students will be able to:
✓ Decontextualize mathematical and non-mathematical situations.	✓ Symbolically represent mathematical and non-mathematical situations.	✓ Symbolically represent mathematical and non-mathematical situations.
✓ Search for regularities, patterns, and structures.	✓ Search for regularities, patterns, and structures.	✓ Analyze regularities, patterns, and structures.
	✓ Analyze regularities, patterns, and structures.	

Grade 2 Applications:

Grade 2 students begin to abstract and generalize by identifying and describing patterns, relationships, and structures in a wide range of contexts. They transition from simple observations to crafting explanations of why patterns occur and use that understanding to make predictions or solve problems. Students in second grade begin learning to decontextualize through familiar situations by representing them symbolically with equations, models, or number sentences and then they connect these representations back to the original context. The progression of this thinking, for early learners, should follow a sequence of concrete-pictorial-abstract. Therefore, these students should start with familiar contexts and concrete connections, transfer thinking to creating or considering pictorial representations, and then use the subsequent understanding to grasp abstract concepts and form generalizations. The goal, at this stage, is to have students begin forming generalizations about how mathematical concepts and reasoning work. These experiences help students advance their ability to reason abstractly while maintaining the ability to connect mathematical reasoning to applicable contexts to give meaning to abstractions.

Key Elements of a Rich Abstract and Generalize Task:

Learning tasks that engage students in abstracting and generalizing may have some or all the following characteristics:

- **Decontextualization:** In mathematics, tasks that involve decontextualization require separating a concrete problem from its application context to represent it abstractly (common examples of this can be found in word or story problems). Students should be required to present contextual information in mathematical ways. This process allows students to translate a situation into mathematical language to reason and solve without being overly dependent on the story or context. Teachers may support this by providing materials, visual representations, or strategies that help students translate the information they are presented with. For **grade 2** students, this might involve using manipulatives or other representations to model a scenario involving addition or subtraction before writing an equation. For example, in a problem such as "There are 72 inches of ribbon available to wrap a present. You cut 25 inches of ribbon, how many inches of ribbon remain?" students might first use connecting cubes or paper strips to model the 72 inches and remove 25, draw a bar model, or use a number line to visualize what is left, representing the situation pictorially before writing the abstract equation 72 – 25 = ___. This progression from the concrete context to pictorial to symbolic representations, helps students make sense of the math and strengthens their ability to reason abstractly.
- **Symbolic Representation:** Learning activities involve symbols, numerals, and visual representations of mathematical concepts to support forming connections between abstract and concrete thinking. In **grade 2**, students continue to rely on the use of visual representations, such as number lines, tape diagrams, connecting cubes, base-ten blocks, and ten frames to support their ability to express quantities and relationships using symbolic notation. For example, during a data task, students might determine the total number of first and second graders by representing each group with a bar model or base ten drawing before writing an equation 36 + 42 = 78. These visual supports help students understand and make sense of the quantities involved and create a mechanism for clarifying how the symbolic number sentence represents the situation. As students develop their math identity and confidence, they use symbols at greater frequency to record their thinking and communicate mathematical ideas.

- **Pattern Recognition and Exploration:** Tasks provide opportunities for students to notice, create, or extend patterns using tools, strategies, or representations to help students identify regularities. In **grade 2,** pattern work becomes more intentional and connected to foundational concepts like counting sequences, operations, and place value. **Grade 2** students might use these patterns to explore how adding and subtracting changes only the tens place or noticing relationships between even and odd numbers.
- **Structural Analysis:** Activities ask students to recognize, understand, and utilize patterns, relationships, or properties within mathematical concepts to generalize and apply mathematical ideas. In **grade 2**, students begin to understand and use the underlying structure of our numerical system, especially within the context of place value, to make sense of addition and subtraction. Students begin to use this information to form generalizations, for example, recognizing that if 23 + 40 =63, that 24 + 40 must be 64 because only the value in the one's place changed.
- **Generalization:** Tasks require identification of patterns, prediction of outcomes, or application of mathematical principles to broad contexts and applied situations. Students will need to abstract key ideas and extend them to new situations, both real and theoretical. In **grade 2**, students may be asked to describe what they notice, predict what comes next, or apply this thinking in new contexts, helping them move toward abstract thinking. In this grade level, this is heavily supported by pictorial or manipulative representations. For example, after working with base-ten blocks to model adding ten to various numbers, students might generalize that "when you add 10, only the tens place changes," and then apply this rule to new numbers without manipulatives.
- **Relevant Contexts:** Use examples relevant to students lived experiences, local communities or Indigenous Peoples of Montana where students must consider how mathematical theories apply to situational contexts. **Grade 2 e**xamples may include working with coins and bills to determine whether they have enough money to purchase an item at a grocery store, comparing the number of leaves collected from two trees during autumn, or beginning to work with data that represents situations relevant to their communities.

Ways Adults Can Support Students in Learning to Abstract and Generalize:

Some ways adults can support students in developing their abstracting and generalizing skills include:

- **Model Observing Patterns and Relationships:** Verbally describe patterns or groupings as they arise, such as saying, "I see a red-blue-red-blue pattern here. What do you think comes next?"
- **Ask Guiding Questions:** Use prompts like, "Can you show me a pattern with these blocks?" or "What do you notice about these shapes?"
- **Provide Tools and Examples:** Offer manipulatives such as counters, blocks, or pictures to help students experiment with representing quantities or structures.
- **Encourage Explanation:** Prompt students to explain their reasoning, such as asking, "Why did you group these objects?" or "How did you decide what comes next in the pattern?"
- **Reinforce Vocabulary:** Use grade-appropriate, content area vocabulary terms frequently to help students articulate their observations and ideas. (e.g., "repeat," "group," "pattern," and "same," "bigger," "triangle," etc.). ***Refrain from making up terms for formal mathematical vocabulary terms to simplify the language*** – this creates challenges for students in the future and creates confusion for students in later grades, requiring students to relearn vocabulary in tandem with more challenging mathematical concepts.

Mathematical Practice Standard 3 – Justify and Prove:

Mathematically proficient students create, evaluate, justify, and refute mathematical claims in developmentally and mathematically appropriate ways.

Embedded Skills:

To be considered proficient in this mathematical practice standard, students should be able to demonstrate each of the following skills in developmentally appropriate ways:

- ✓ Create mathematical claims in developmentally and mathematically appropriate ways
- ✓ Evaluate mathematical claims in developmentally and mathematically appropriate ways
- ✓ Justify mathematical claims in developmentally and mathematically appropriate ways
- ✓ Refute mathematical claims in developmentally and mathematically appropriate ways

Skills Timeline:

Students may engage in these skills at the following intervals of the solving process:

Before solving, students will be able to:	During solving, students will be able to:	After solving, students will be able to:
✓ Create mathematical claims in developmentally and mathematically appropriate ways	✓ Create mathematical claims in developmentally and mathematically appropriate ways	✓ Create mathematical claims in developmentally and mathematically appropriate ways
✓ Evaluate mathematical claims in developmentally and mathematically appropriate ways	✓ Evaluate mathematical claims in developmentally and mathematically appropriate ways	✓ Evaluate mathematical claims in developmentally and mathematically appropriate ways
✓ Justify mathematical claims in developmentally and mathematically appropriate ways	✓ Justify mathematical claims in developmentally and mathematically appropriate ways	✓ Justify mathematical claims in developmentally and mathematically appropriate ways
✓ Refute mathematical claims in developmentally and mathematically appropriate ways	✓ Refute mathematical claims in developmentally and mathematically appropriate ways	✓ Refute mathematical claims in developmentally and mathematically appropriate ways

** **Special Note:** Students may engage in each of the four skills embedded within this standard at any stage of the solving continuum – depending on the task – but the purpose and depth evolve as students progress through the process.

Grade 2 Applications:

Grade 2 students strengthen their ability to justify and prove ideas in mathematics by providing clearer explanations, using evidence, and beginning to analyze and evaluate the claims others make. Students in second grade are able to move beyond simply providing answers to explain why their solution makes sense, using models and representations to strengthen their argument, and can engage mathematical language to support their reasoning. Grade 2 students are still reliant on concrete and pictorial tools to justify their thinking, but they are becoming more adept at connecting these representations to verbal and written explanations. They can begin to identify when a claim is accurate or inaccurate and can offer suggestions for correction. While formal proofs are not an expectation of second graders, they are able to begin engagement in foundational reasoning practices such as pattern identification, making claims based on evidence, listening to others' reasoning, and communicating justifications using mathematically accurate observations and vocabulary.

Key Elements of a Rich Justify and Prove Task:

Learning tasks that engage students in justifying and proving may have some or all the following characteristics:

- **Make and Test Claims:** Tasks prompt students to form statements they believe might be true based on their observations and then test these claims using mathematical methods. In **grade 2**, students might describe mathematical observations and test these claims in developmentally appropriate ways. For instance, making statements such as "I think these two values are the same" or stating, "I think the answer is ___", then testing their hypothesis.
- **Evaluation of Claims:** Learning activities encourage students to determine whether a claim is accurate by comparing or testing it in mathematically appropriate ways. **Grade 2** students use models, representation, and known facts to check whether claims are true or false. They may use concrete tools, draw pictures, or use place value reasoning to verify relationships and determine whether solutions are reasonable. For example, when presented with a claim such as "145 > 196", students might use base ten blocks or place value knowledge to demonstrate why the claim is false.
- **Evidence-Based Reasoning to Justify:** A learning task might require students to explain and provide evidence of their thinking using developmentally appropriate tools (e.g., technology, manipulatives, etc.), vocabulary, and methods (e.g., verbal statements, drawings, etc.). **Grade 2** students use precise, age-appropriate language to explain their thinking, and support this thinking with developmentally appropriate tools and methods.
- **Opportunities for Refutation:** Tasks provide flawed examples or incorrect claims for students to analyze, correct, and justify with evidence, fostering critical thinking. Tasks may also encourage students to identify and revise their own misconceptions. For example, **grade 2** students can recognize and explain mistakes by using models, drawings, or place value reasoning to show why a claim is incorrect. They may correct a peer's strategy by pointing out where the error occurred or by offering a more effective method. Students are also able to reflect on their own misconceptions. At this level, students are continuing to learn to disagree respectfully and support their counterarguments with evidence.

Ways Adults Can Support Students in Learning to Justify and Prove:

Some ways adults can support students in developing their justifying and proving skills include:

- **Model Clear Explanations:** Demonstrate how to explain reasoning, such as saying, "I know these groups are equal because I counted five in both."
- **Ask Probing Questions:** Use prompts like, "How do you know that's true?" or "Can you show me why this works?"
- **Provide Opportunities for Practice:** Require students to explain their reasoning frequently, both individually and in groups.
- **Encourage Reflection:** After students provide thinking, ask follow-up questions like, "What made you think that?" or "Does this always work?"
- **Help Students Learn to Disagree Respectfully:** Consider introducing common misconceptions and guide students in refuting them while modeling appropriate communication.
- **Praise the Process:** Creating, evaluating, justifying, and refuting mathematical claims are fundamental to mathematics at all levels. Praising students for this process—even when they're wrong—builds confidence. Remind learners that many mathematicians spend years solving just one problem!
- **Foster a Safe Environment:** Ensure students feel comfortable sharing their reasoning, even if it's incorrect, by reinforcing that mistakes are valuable learning opportunities.

Mathematical Practice Standard 4 – Model with Mathematics:

Mathematically proficient students:

- ***Make sense of a scenario;***
- ***Identify a problem to be solved, and mathematize it; and***
- ***Apply a mathematical model to reach a solution and verify its viability.***

Embedded Skills:

To be considered proficient in this mathematical practice standard, students should be able to demonstrate each of the following skills in developmentally appropriate ways:

- ✓ Make sense of a scenario
- ✓ Identify a problem to be solved
- ✓ Mathematize problems
- ✓ Apply mathematical models to reach a solution
- ✓ Verify the validity of a chosen mathematical model

Skills Timeline:

Students may engage in these skills at the following intervals of the solving process:

Before solving, students will be able to:	During solving, students will be able to:	After solving, students will be able to:
✓ Make sense of a scenario	✓ Mathematize problems	✓ Verify the validity of a chosen mathematical model
✓ Identify a problem to be solved	✓ Apply mathematical models to reach a solution	

Grade 2 Applications:

Grade 2 students strengthen their ability to model by using drawings, diagrams, number sentences, simple displays of data, early graphs, and concrete tools to represent contextual situations. Second graders are beginning to identify the problem in a provided scenario, determine which quantities matter, and strategically choose representations that help make sense of the situation. At this stage of development, students still rely on manipulatives and visual models. They learn to test whether the model chosen matches the context. With teacher support, students can begin to revise models that do not fully capture the situation.

Key Elements of a Rich Model with Mathematics Task:

Learning tasks that engage students in modeling may have some or all the following characteristics:

- **Mathematize:** Tasks require students to translate contextual information into mathematical problems. For example, if given a scenario where two classmates measure how far their toy cars traveled, **grade 2** students might be able to represent the situation with an addition or subtraction equation to compare the distances or determine how much further on car went.
- **Real-World Scenarios:** Learning activities present situations and contexts familiar to students, such as socializing with friends or solving community problems, to help them create and test mathematical models. In **grade 2**, students use familiar contexts such as measuring and comparing lengths of classroom objects, determining whether they have enough money to buy an item, or analyzing data about their class or community.
- **Sense-Making:** Tasks require students to make sense of realistic scenarios or situations using mathematics. Often, activities are accompanied by tools or resources, such as manipulatives, drawings, explanations, symbolic representations, or other resources to help students make sense of scenarios visually, physically, verbally, symbolically, and contextually. In **grade 2**, students might be presented with a scenario such as "Our class collected 46 cans for the food drive and 28 more on Tuesday. How could we figure out how many cans we have all together?" Students may use a variety of methods to understand and solve the situation, such as place-value blocks, number lines, bar models, equations, or various strategies.

- **Problem-Solving and Verification:** Tasks include aspects that ask students to create a model, test it, and check if their model and solution accurately reflect the problem. For example, **grade 2** students might recalculate or redraw to make sure the solution works.
- **Student Agency:** Activities create opportunities for students to be empowered in the problem-solving process such as considering a scenario, defining a problem presented in the scenario, and selecting the approach to mathematize and solve. **Grade 2** students may choose a community-based problem, like broken playground equipment, and develop a fundraising plan to replace it with their teacher. They may engage in mathematics by totaling the value of donations collected on different days, using addition or subtraction to find how many more dollars they will need to raise, or by helping to measure the space where new equipment will go (for example).
- **Multiple Entry Points or Multiple Problems to be Solved:** Learning activities contain multiple mathematical problems students can choose to identify or multiple entry points for solution-making in a single problem. In **grade 2**, this may look like offering a story-driven or hand-on activity that allows for varying levels of engagement and solving approaches, for instance, "How many different ways can we partition this rectangle into equal shares?" or choose whether to compare lengths, add distances, or create a data display during an investigation.
- **Productive Struggle:** Tasks should provide scaffolded challenges, resources, and encouragement to support students in modeling situations mathematically. Students should be challenged in ways that feel uncomfortable but not impossible and able to persevere without feeling overwhelmed. **Grade 2** students may be provided with tools such as base-ten blocks, number lines, open arrays, simple diagrams, or others, to support their efforts to attempt problems of increasing complexity. These supports can encourage them to keep trying rather than immediately seeking help, leading to the development of productive mathematical dispositions.
- **Engagement, Curiosity, and Creativity**: Learning activities contain accessible opportunities for students of varying abilities and proficiency to engage in the task with natural curiosity and promote the utilization of creative thinking, mathematical representation, and problem-solving. **Grade** 2 students may be exposed to hands-on investigations, story-based scenarios, simple projects, and exploratory tasks that allow them freedoms to choose tools, create models, and show their thinking in multiple ways. These nurture students' intrinsic interest in mathematics and support a growing willingness to engage in mathematical experimentation with strategies, representations, and ideas.

Ways Adults Can Support Students in Learning to Model with Mathematics:

Some ways adults can support students in developing their modeling skills include:

- **Promote Mathematical Inquiry:** Ask questions such as "What mathematical questions do we have about this situation?", "What are you curious to know more about?", or "How can math help us in this scenario?"
- **Pose Open-Ended Questions:** Use prompts like, "What would help us model this situation?" or "What would help us better understand the problem?"
- **Model the Use of Tools and Resources:** Demonstrate how to use a variety of tools and resources to represent and solve problems. For example, in the classroom, if you are graphing a line, explain why a straight edge is useful. In the context of the home, caregivers might articulate to children how a tape measure and level might help hang a picture on a wall and support calculating the placement of the frame.

- **Encourage Verification:** Ask students, “Does your model match the problem?” or “Can you check to see if your answer makes sense?”
- **Provide Realistic Contexts:** Design tasks that reflect students' daily experiences to enhance relevance and engagement. Where appropriate, integrate community-based or culturally significant scenarios, including those of the Indigenous Peoples of Montana, to help students recognize math as a powerful tool for problem-solving in realistic situations. This approach can empower students to see math as a tool for overcoming obstacles in their daily lives and create a sense of pride, ownership, and accomplishment in learning.
- **Celebrate Creativity:** Praise students for unique or innovative ways of modeling problems, reinforcing that there are many ways to make sense of a scenario.
- **Offer Tools and Resources Before Hints or Solutions:** Before providing students with a pathway to the answer, try offering a tool, such as “Can using our blocks help us?” You can stick around and offer encouragement and support as a fellow problem solver instead of a solution bringer. This fosters perseverance and confidence in students.

Mathematical Practice Standard 5 – Represent:

Mathematically proficient students:

- ***Recognize, use, create, interpret, and translate representations using appropriate methods and tools, and***
- ***Understand multiple ways of representing mathematical ideas and how they are related.***

Embedded Skills:

To be considered proficient in this mathematical practice standard, students should be able to demonstrate each of the following skills in developmentally appropriate ways:

- ✓ Recognize representations using appropriate methods and tools
- ✓ Use representations using appropriate methods and tools
- ✓ Create representations using appropriate methods and tools
- ✓ Interpret representations using appropriate methods and tools
- ✓ Translate representations using appropriate methods and tools
- ✓ Understand multiple ways of representing mathematical ideas
- ✓ Understand how multiple ways of representing mathematical ideas are related

Skills Timeline:

Students may engage in these skills at the following intervals of the solving process:

Before solving, students will be able to:	During solving, students will be able to:	After solving, students will be able to:
✓ Recognize representations using appropriate methods and tools	✓ Use representations using appropriate methods and tools	✓ Interpret representations using appropriate methods and tools
✓ Understand multiple ways of representing mathematical ideas	✓ Create representations using appropriate methods and tools	✓ Understand multiple ways of representing mathematical ideas
	✓ Interpret representations using appropriate methods and tools	✓ Understand how multiple ways of representing mathematical ideas are related
	✓ Translate representations using appropriate methods and tools	
	✓ Understand how multiple ways of representing mathematical ideas are related	

Grade 2 Applications:

Grade 2 students expand their ability to recognize and create representations of mathematical ideas as they continue to develop along the concrete-pictorial-abstract continuum. They use a widening range of tools and models to communicate their thinking, solve problems, and show relationships. At this stage of development, students can begin making more intentional choices about which representations are appropriate to use and can start to explain how different representations are interconnected. The use of physical representations remains essential for sense-making and students will continue to use manipulatives frequently in grade 2. Pictorial(visual) representations take on more sophistication in grade two as students draw bar models, number lines, arrays, simple graphs, and diagrams to represent relationships, organize data, and show their reasoning. Symbolic representations are growing in importance for second graders, involving equations, unknowns, comparison symbols, and place value reasoning. Verbal representations continue to expand as students acquire more mathematical vocabulary, precision, and communication, and writing abilities. Finally, contextual representations remain critical for grade 2 as students are asked to model mathematical situations to engage in abstract critical thinking. Grade 2 activities should provide opportunities to use each of the five representation types in flexible ways to support the continued development of clear and increasingly abstract mathematical comprehension.

Key Elements of a Rich Represent Task

Learning tasks that engage students in representing may have some or all the following characteristics:

- **Recognition of Representations:** Tasks present mathematical concepts in multiple forms (e.g., visually, symbolically, verbally, contextually, or physically) and prompt students to recognize them as representations of the same mathematical idea. In **grade 2**, students begin to identify how different models show the same quantity or relationship. For example, students may notice that a base-ten block model, a number line, and an equation like 46 + 18 = 64 can all represent the same addition situation. They learn to connect these representations, gain the ability to explain how one relates to another, and build an understanding that shifting between representations can support clearer thinking and more efficient problem-solving.

- **Multiple Representations:** Tasks incorporate recognizing or using visual, symbolic, verbal, contextual, or physical representations to deepen their understanding. For example, **grade 2** students might be presented with a contextual or verbal scenario, draw visual models such as bar diagrams or open number lines, or write numerical statements to match their observations. They may also begin working with a wider range of tools such as place value models, base ten blocks, number strips, number lines, and early graphical representations such as picture and bar graphs to represent quantities, relationships, or contextual situations. Grade 2 students may continue to rely on physical tools, drawings, and gestures used in earlier grades to support sense-making. Continuing to emphasize multiple representations at this stage supports the development of concrete, pictorial, and abstract thinking, which are all foundational to more advanced skills.
- **Creation of Representations:** Learning activities provide opportunities for students to develop their own representations to make sense of mathematical ideas. In this case, students may not be given a directive of which representation to use granting agency to select their own. These self-generated representations strengthen students' mathematical reasoning and problem-solving skills. **Grade 2** students might choose to draw more detailed models than in previous grades, such as open number lines, bar models, arrays, or simple picture graphs. They may also use place value blocks to represent quantities, create symbolic equations or expressions to match a situation, or use multiple representations, such as a drawing and equation to show their thinking or justify their reasoning. **Grade 2** students are still reliant on physical or visual models to support understanding but are becoming increasingly able to engage in abstract thinking when supported by these tools.
- **Interpretation of Representations:** Tasks are designed in ways that require students to describe and comprehend the mathematical concepts shown in a representation. For instance, a **grade 2** student might be provided with an image or physical example of base ten blocks (e.g., nine hundreds, five tens, and one one) and asked to interpret the quantity by writing the numeral (951) and verbalizing it as "nine hundred fifty-one." Students use these experiences to connect physical or visual models to symbolic and verbal forms. In many cases, these are accompanied by contextual situations and support the advancement along the concrete-pictorial-abstract progression of reasoning and understanding.
- **Translation Between Representations:** Tasks prompt students to connect and translate between different forms of representation. **Grade 2** students may be presented with one type of representation (e.g., picture graph, bar graph, contextual description, number line, etc.) and asked to translate the meaning to another, describing how two or more representations show the same information. For example, in **grade 2**, students may participate in a classroom data activity that compares which plants are most grown in gardens in their community (e.g., corn, tomatoes, squash, etc.). They would first collect the data using tally marks (contextual and verbal representations), then create a picture or bar graph (visual representation), and finally write statements or write simple comparison expressions such as "more families grow tomatoes than squash" or "16 tomatoes > 4 squash" (verbal and symbolic representations). In so doing, students learn how each representation shows the same information and how translating between them strengthens understanding of the data and community.
- **Exploring Multiple Representations:** Learning activities provide opportunities to connect different forms of representation to reinforce that mathematical ideas can be expressed in many ways. In **grade 2**, for example, this might mean asking students to try to come up with as many ways as they can to represent the number "263". When asked how they could represent it visually, students might draw a number line, base ten block model, or another visual model. Symbolically, they might write equations such as "263 = 200 + 60 + 3." Verbal representations might

include the statement “two hundred and sixty-three,” while contextual representations might include personally relevant situations such as “The number of students in our school” or “The number of miles between two communities.” This process increases student recognition that each representation shows the same quantity in a different way, which strengthens their representational flexibility and number sense.

- **Open-Ended Choices:** Tasks allow students to choose their preferred representation method, promoting creativity and exploration. In **grade 2**, this might look like providing students with options to demonstrate a mathematical relationship by drawing a visual model, building with manipulatives such as place value blocks, creating a simple graph, or writing an equation that matches the situation. Students should have the flexibility to select the representation that best supports the development of their understanding and prompted to explain why they chose that representation.

Ways Adults Can Support Students in Learning to Represent:

Some ways adults can support students in developing their representing skills include:

- **Model Different Representations:** Demonstrate using manipulatives, drawings, and symbols to represent the same quantity or problem.
- **Ask Guiding Questions:** Use prompts like, “How can you show this with a picture?” or “What is an alternate way to represent this?”
- **Provide Opportunities for Translation:** Encourage students to connect representations by asking, “Can you draw a picture for what your blocks show?” or “What does this table tell us about this graph?”
- **Celebrate Diverse Approaches:** Praise students for using different methods to represent a problem, reinforcing that all valid representations help us understand math better.
- **Introduce Real-World Contexts:** Engage students with tasks that involve representing mathematical scenarios from their daily lives to make representations concrete and relevant. For instance, students may be encouraged to find representations of geometric symmetry in their lives, such as through the artistic patterns on Lakota Star Quilts, Mexican Talavera Tiles, structures in their communities, the wings of the Mourning Cloak Butterfly, Wild Rag Scarves, and beyond.

Mathematical Practice Standard 6 – Collaborate Mathematically:

Mathematically proficient students engage in mathematics as a social enterprise through discussion and collaborative inquiry where ideas are offered, debated, connected, and built upon toward solutions, shared understanding, and appreciation of other perspectives.

Embedded Skills:

To be considered proficient in this mathematical practice standard, students should be able to demonstrate each of the following skills in developmentally appropriate ways:

- ✓ Engage in mathematics as a social enterprise
- ✓ Engage in mathematical discussions
- ✓ Engage in collaborative mathematical inquiry
- ✓ Offer mathematical ideas
- ✓ Debate mathematical ideas
- ✓ Connect mathematical ideas
- ✓ Build upon mathematical ideas toward solutions
- ✓ Work toward a shared understanding of mathematical ideas
- ✓ Appreciate other mathematical perspectives

Skills Timeline:

Students may engage in these skills at the following intervals of the solving process:

Before solving, students will be able to:	During solving, students will be able to:	After solving, students will be able to:
✓ Engage in mathematics as a social enterprise	✓ Engage in collaborative mathematical inquiry	✓ Work toward a shared understanding of mathematical ideas
✓ Engage in mathematical discussions	✓ Offer mathematical ideas	✓ Appreciate other mathematical perspectives
✓ Engage in collaborative mathematical inquiry	✓ Debate mathematical ideas	✓ Connect mathematical ideas
✓ Offer mathematical ideas	✓ Connect mathematical ideas	
✓ Debate mathematical ideas	✓ Build upon mathematical ideas toward solutions	
✓ Appreciate other mathematical perspectives	✓ Work toward a shared understanding of mathematical ideas	
	✓ Appreciate other mathematical perspectives	

Grade 2 Applications:

Grade 2 students continue to engage in collaborative mathematical activities through group work, discussions, and shared problem-solving experiences. At this stage, students are becoming increasingly capable of listening to their peers, asking clarifying questions at appropriate intervals, and responding to others' thinking in respectful and thoughtful ways. They are beginning to explain the strategies they chose to use using emerging

mathematical language and reasoning and can compare their approach with those of their peers. Collaborative inquiry may involve working together in groups or partnerships to model scenarios, create representations, evaluate open-ended tasks, or analyze data as a group. Students continue to advance their abilities to connect ideas to build on the thinking of their classmates and respectfully critique the reasoning of others with evidence. While **grade 2** students still benefit from explicit modeling of effective communication, such as sentence stems and structured discussions, they show increased independence in participating in group discussions, sharing their thinking, and working collaboratively toward shared understanding than in previous years.

Key Elements of a Rich Collaborate Mathematically Task:

Learning tasks that engage students in mathematical collaboration may have some or all the following characteristics:

- **Group Problem Solving:** Learning tasks require students to work together to solve a shared problem. This could include all students contributing to a single solution or each student solving a piece of a larger problem, requiring connectivity and collaboration to complete the overall task. For example, in **grade 2**, students might work together to determine how to measure an object when presented with multiple tools and options by discussing which tools are appropriate, sharing strategies, and comparing measurements.
- **Idea Generation and Sharing:** Activities create opportunities for students to generate, express, and investigate their own mathematical ideas in a group setting. Teachers should encourage students to share freely with the knowledge that their contributions are valued. For example, **grade 2** students might work together to partition circles or rectangles into equal shares. Groups might explore different ways to create equal shares (two-halves, three-thirds, and four-fourths). Students can compare their representations, discuss why the shares are equal, and explain their methods to the class to build a shared understanding among group members and class peers.
- **Respectful Discussion and Debate:** Tasks invite students to listen to and respond to their peers' ideas, including offering counterarguments, asking clarifying questions, and making connections between different approaches. Teachers should encourage students to respectfully agree, disagree, and communicate effectively. For instance, when comparing different ways to solve a subtraction problem, **grade 2** students might provide responses, and the teacher may prompt "Do you agree with the strategy? Why or why not?" Students can respectfully discuss why certain responses are accurate or inaccurate.
- **Building on Others' Ideas:** Tasks support students in co-constructing solutions, encouraging them to build upon their peers' reasoning, rather than working in isolation. In a **grade 2** classroom, students may engage in a story problem such as "We collected 36 cans for the food drive on Monday and 27 more on Tuesday. How many cans do we have in all?" One student might start the discussion with a statement such as "I added 30 and 20 to get 50, then added 6 and 7 to get 13, so the total is 63." Another student might add, "I did something similar, I started with 36 and then added 27 on a number line by adding 20 then 7." These exchanges show that students can build on one another's strategies, make connection, and contribute ideas to strengthen a group's understanding.
- **Appreciation of Other Perspectives:** Activities require students to listen actively and consider their classmates' mathematical ideas, even if they do not fully understand them yet. Learning also fosters curiosity, a willingness to ask questions and explore different ways of thinking. In a subtraction or addition problem, **grade 2** students may try a particular strategy. If some do not understand the reasoning, they may be encouraged to ask, "Can you tell me why you solved it that way?"

- **Shared Materials & Resources:** Learning activities involve a finite set of tools or materials, requiring students to negotiate, plan, and collaborate to use them effectively. In grade 2, for example, students might work in small groups to measure classroom objects but only have access to a limited number of rulers, tape measures, or meter sticks. Students will need to therefore coordinate as a group to determine who will measure which items, how tools will be shared, and how the group members will compare to ensure accuracy. These collaborative experiences help students advance their abilities to solve problems, communicate, and share responsibility within mathematics.
- **Reciprocal Responsibility & Participation:** Tasks provide opportunities for each student to play a meaningful role in the group's process and include measures that hold students accountable to their group. Each child should be contributing and engaged in the collective mathematical learning experience. In grade 2, when organizing and representing class data, students might share responsibilities by having one child collect tally marks, another transfer the data onto a graph, and another write statements of comparison. Dividing roles ensures that every student has an opportunity to participate and that groups learn to rely on one another to work collaboratively.
- **Relational Learning & Community Building:** Learning activities help students see math as a social activity that strengthens relationships among learners and peers through shared problem-solving experiences. A **grade 2** class may work side by side to solve the same problem while discussing their ideas, asking each other questions, and building understanding together.

Ways Adults Can Support Students in Learning to Collaborate Mathematically:

Some ways adults can support students in developing their mathematical collaboration skills include:

- **Normalize Mistakes:** Frame mistakes as a valuable part of learning demonstrating that "Not knowing is not failure; it is the first step to understanding" (Finkle, 2016). Encourage students to test ideas, refine strategies, and learn from their attempts. Emphasize that mistakes spark discussion and discovery, fostering a safe and collaborative learning environment.
- **Model Respectful Communication:** Demonstrate how to listen attentively and respond thoughtfully to others' ideas, such as saying, "I like how you thought of that! What if we also tried this?" or "I do not understand what you're saying yet. Can you tell me more?"
- **Facilitate Group Discussions:** Use prompts like, "What do you think of [person's] idea?" or "Can you add to what your friend said?"
- **Encourage Turn-Taking:** Help students navigate conversations and shared materials by reinforcing patience and respect. If students interrupt or struggle to take turns, model mediation by saying, "[Person A] wasn't finished speaking yet. To fully understand their idea, let's let them finish. If you have thoughts or questions, raise your hand, and you'll have a turn next."
- **Guide Reflection on Group Work:** Ask students to reflect on their collaboration with questions like, "How did working together help us solve this problem?" or "What did you learn from your friends today?"
- **Celebrate Group Success:** Reinforce the value of teamwork by praising the group's collective effort, such as saying, "You all worked so well together to figure that out!" or "I know it was challenging at times to work together, but you kept going and completed the task—great job!"

Mathematical Practice Standard 7 – Culturally Connect:

Mathematically proficient students:

- ***Recognize cultural connections and contributions to mathematics; and***
- ***Appreciate the role of mathematics in various cultural contexts, including those of tribally specific Montana Indigenous Peoples.***

Embedded Skills:

To be considered proficient in this mathematical practice standard, students should be able to demonstrate each of the following skills in developmentally appropriate ways:

- ✓ Recognize cultural connections to mathematics
- ✓ Recognize cultural contributions to mathematics
- ✓ Appreciate the role of mathematics in various cultural contexts, including those of tribally specific Montana Indigenous Peoples

Skills Timeline:

Students may engage in these skills at the following intervals of the solving process:

Before solving, students will be able to:	During solving, students will be able to:	After solving, students will be able to:
✓ Recognize cultural connections to mathematics	✓ Recognize cultural connections to mathematics	✓ Recognize cultural connections to mathematics
✓ Recognize cultural contributions to mathematics	✓ Recognize cultural contributions to mathematics	✓ Recognize cultural contributions to mathematics
✓ Appreciate the role of mathematics in various cultural contexts, including those of tribally specific Montana Indigenous Peoples	✓ Appreciate the role of mathematics in various cultural contexts, including those of tribally specific Montana Indigenous Peoples	✓ Appreciate the role of mathematics in various cultural contexts, including those of tribally specific Montana Indigenous Peoples

** **Special Note:** Students may engage in each of the three skills embedded within this standard at any stage of the solving continuum – depending on the task – but the purpose and depth evolve as students' progress through the process.

Grade 2 Applications:

Grade 2 students continue to recognize cultural connections in mathematics by exploring how math is a universal human experience with deep historical roots across Indigenous and modern cultures worldwide. They engage with mathematical concepts in relevant ways, such as examining

culturally and mathematically significant objects, hearing stories that incorporate math, and learning about mathematical contributions from diverse cultures, including Montana's Indigenous Peoples. Activities may also introduce the historical development of mathematics and how it has shaped contemporary cultural contexts. Students are encouraged to connect their own mathematical learning to their lived experiences, traditions, families, and communities to strengthen their sense of belonging in mathematics. Throughout grade 2, learners develop increasing awareness and appreciation of the diverse cultural applications and contributions that have shaped mathematics.

Key Elements of a Rich Culturally Connect Task:

Learning tasks that engage students in cultural connection may have some or all the following characteristics:

- **Contextual & Cultural Connection:** Tasks provide connection between mathematical concepts and cultural practices. These cultural practices can present in a variety of forms, such as Montana Indigenous Peoples, global cultures, local communities, or students' lived experiences. Teachers may provide examples of cultural contexts or ask students to share math-related traditions or activities such as cooking measurements or traditional games. In **grade 2**, teachers might provide context related to a local cultural event, such as a community festival, fair, rodeo, or powwow, and ask students to consider mathematical situations at this event. Examples might include comparing lengths of dance regalia fringe, organizing data about favorite activities at a powwow or fair, counting or grouping items at vendor booths, or measuring distances between event locations.
- **Essential Understandings:** Learning activities with connection to Indigenous practices, peoples, and experiences engage the Essential Understandings and Multi-Cultural Approaches to best align with the principles of Indian Education for All. **Grade 2** students might be exposed to these understandings in various ways, depending on instructional design.
- **Diverse Perspectives:** Activities may showcase and compare how various cultures approach similar mathematical ideas and cultural concepts. Examples might include number representations, using tools for measuring, or using geometric patterns in artistic expression. For example, students in **grade 2** might learn how different cultures perceive and track time, then asked to consider how historical peoples might have decided the time before clocks. After a brief brainstorming session, the teacher might then provide opportunities for students to learn about perspectives from specific Montana Tribes or explore methods from local or global cultures. Teachers might also provide examples of traditional practices still in use, such as the use of sun dials in people's gardens, shadows, hourglasses, church or school bells, etc.
- **Math as a Universal Tool:** Tasks promote mathematics as a universal tool that has meaning and application across cultures and communities, challenging students to connect mathematical concepts to contextual applications. **Grade 2** students might engage in this practice by considering how mathematical concepts are used as tools in their homes or lives. Some examples might include using place value to count or organize items at home, measuring ingredients during family cooking, comparing distances traveled for community events, or keeping track of time during daily routines. Students will explore how math helps them in these moments.
- **Hands-On and Inquiry-Based**: Tasks provide opportunities for students to actively engage in mathematical reasoning through culturally relevant activities, such as mapping land features with Indigenous methods, solving local community-based problems, or investigating the mathematics of historical architecture. Examples in **grade 2** might include a presentation of a community problem, such as helping plan a

fundraiser walk-a-thon. Students can explore questions within this context such as how many laps participants need to walk to reach a goal, how much distance is covered each lap, or how to compare the number of laps walked by different groups or walkers.

- **Storytelling and Oral Traditions**: Learning may incorporate narratives, legends, or oral histories that include mathematical thinking, such as counting in traditional games, measuring for seasonal changes, or problem-solving in folktales. **Grade 2** students might be asked mathematical questions during reading time, such as "How many more were gathered on day one than day two?" or "How far did the character gather all together?" Alternately, they might listen to an Elder or community member share their perspective, experience, or a story and create mathematical questions about what they hear.
- **Connection to Everyday Life**: Activities contextualize math in ways that reflect students' own lives and communities, such as using family recipes to explore ratios or examining how local businesses price and trade goods. **Grade 2** activities might utilize developmentally appropriate examples with familiar objects or routines.
- **Use of Language and Symbols from Different Cultures**: Tasks may include Indigenous languages, historical number systems, or culturally significant symbols, to expand students' understanding of mathematical representation. **Grade 2** students might explore counting with different languages, examine different numeral systems, or explore how Indigenous cultures recorded numerical information historically.
- **Reflection and Discussion**: Learning tasks prompt students to think critically about their personal cultural experiences with math and consider how different communities and nations approach mathematics. Students in **grade 2** will expand their ability to reflect, discuss, and consider the perspectives of others.

Ways Adults Can Support Students in Learning to Culturally Connect:

Some ways adults can support students in developing their cultural connection skills include:

- **Review the Essential Understandings Regarding Montana Indians:** This document can support adults in understanding the seven guiding principles behind Indian Education for All. These principles provide a foundation for incorporating Indigenous perspectives into mathematical learning.
- **Integrate Authentic Examples:** Incorporate cultural contexts such as geometric designs in Montana Indigenous art, local events, or astronomy in planting cycles to illustrate how math is embedded in local and cultural traditions. Use realistic historical or modern examples related to global, local, or Indigenous contexts and issues to make math relevant and meaningful to students' lived experiences and communities.
- **Highlight Everyday Math in Practices**: Talk about ways math appears in daily life through traditions like quilting, weaving, cooking measurements, agriculture, or budgeting within different cultural and community contexts.
- **Provide Culturally Relevant, Reliable Resources:** Introduce tools, artifacts, context, or resources with modern and historical significance to different cultures, like Indigenous counting systems or items used in traditional games. Be sure that resources are relevant and come from reliable sources. **Use caution when engaging technological tools, such as Artificial Intelligence (AI)** as a resource for cultural information – this information must be properly vetted. While large language model AI tools are continually evolving, it is important to recognize that, as of the writing of this document, they have been known to misrepresent or misattribute cultural practices and citations.

- **Invite Community and Cultural Experts**: Partner with Tribal Elders, community members, families, or professionals from diverse backgrounds to share firsthand knowledge of how math is used in their traditions and professions.
- **Recognize and Honor Mathematical Contributions from Many Cultures**: Share stories of the mathematical discoveries of Montana's Indigenous Peoples, American, and global cultures. Ensure that students understand that mathematical knowledge has been independently developed in many places throughout history.
- **Encourage Collaboration Across Cultural and Linguistic Backgrounds**: Support students in working with diverse peers, emphasizing that language and cultural differences are assets to mathematical learning.
- **Encourage Multilingual Math Discussions**: Support students in using their home languages when discussing math, reinforcing that mathematical reasoning is universal and not limited to one language.
- **Model Curiosity and Respect:** Demonstrate a genuine interest in diverse mathematical practices by sharing your learning process and engaging students in discussions about their cultural or experiential observations. Adults do not need to be experts in every culture or the history of mathematics. Modeling respectful inquiry and a willingness to learn fosters a reciprocal learning experience that benefits both students and adults.
- **Encourage Student-Led Cultural Math Connections**: Give students opportunities to research and present how math appears in their own culture or heritage, fostering pride and deeper connections.

GRADE 2 MATHEMATICS CONTENT STANDARDS – OVERVIEW

Overview:

A **content standard** in mathematics is a specific statement that defines the knowledge, skills, and understandings that students are expected to achieve at a particular grade level or within a course of study. Content standards articulate the **what** of student learning, providing clear expectations for the mathematical concepts and procedures that should be taught and mastered.

These mathematics content standards presented here reflect the expectations of what grade 2 students are expected to know and be able to do as reflected in the Administrative Rules of Montana 10.53.503. Expanded guidance, clarifying the meaning, instructional examples, and examples of proficiency rubrics are available for each standard in subsequent sections of this document.

Operations and Algebraic Thinking (OA)

- Use addition and subtraction within 100 to solve one- and two-step problems in context involving all problem types. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. (MT.2.OA.1)
- Flexibly, accurately, and efficiently add and subtract within 20 using mental strategies. (MT.2.OA.2)
- Determine whether a group of objects, up to 20, has an odd or even number of members. (MT.2.OA.3)
- Use addition to find the total number of objects arranged in rectangular arrays. (MT.2.OA.4)

Numbers and Operations in Base Ten (NBT)

- Understand one hundred is a unit composed of ten tens and that three-digit numbers represent amounts of hundreds, tens, and ones. (MT.2.NBT.1)
- Skip-count by 5s, 10s, and 100s. (MT.2.NBT.2)
- Flexibly count, read, write, and represent numbers to 1000. (MT.2.NBT.3)
- Compare two three-digit numbers using >, =, and < symbols. (MT.2.NBT.4)
- Flexibly, accurately, and efficiently add and subtract within 100 using multiple strategies. (MT.2.NBT.5)
- Add up to four two-digit numbers using multiple strategies. (MT.2.NBT.6)
- Add and subtract within 1000 using multiple strategies. (MT.2.NBT.7)
- Using place value, add or subtract 10 or 100 from a given number. (MT.2.NBT.8)
- Understand and make connections between different strategies for addition and subtraction. (MT.2.NBT.9)

Measurement and Data (MD)

- Measure the length of an object by selecting and using appropriate tools. (MT.2.MD.1)
- Understand the relationship between unit sizes and number of units by measuring a single object using two different units of common measurement. (MT.2.MD.2)
- Estimate lengths using units of common measurement. (MT.2.MD.3)
- Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard-length unit. (MT.2.MD.4)
- Use addition and subtraction within 100 to solve problems in context involving lengths that are given in the same units. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. (MT.2.MD.5)
- Represent whole numbers as lengths from 0 and represent sums and differences within 100 on a number line. (MT.2.MD.6)

- Tell and write time from analog and digital clocks to the nearest five minutes using a.m. and p.m. (MT.2.MD.7)
- Solve problems in context involving dollar bills, quarters, dimes, nickels, and pennies using $ and ¢ symbols appropriately. (MT.2.MD.8)
- Generate measurement data and present the data in multiple ways. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. (MT.2.MD.9)
- Organize, represent, and interpret data with up to four categories. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. (MT.2.MD.10)
- Solve addition and subtraction problems of all types using data presented. (MT.2.MD.11)

Geometry (G)

- Recognize and draw shapes having specified attributes. (MT.2.G.1)
- Partition a rectangle into rows and columns of same-size squares and find the total number. (MT.2.G.2)
- Partition circles and rectangles into equal shares, recognize that equal shares need not have the same shape, and express the shares in two-halves, three-thirds, and four-fourths. (MT.2.G.3)

END OF THE GRADE 2 STANDARDS (ELABORATIONS ON NEXT PAGE)

GRADE 2 EXAMPLES AND ELABORATIONS BY STANDARD

This section aims to provide expanded clarification around each standard by providing general notes, instructional examples, Indian Education for All integration examples, and proficiency rubrics. Please read the following explanations of the purpose of each section.

General Notes:

General notes provide clarity around the intent of the task force and the meaning of each standard. These notes may provide an opportunity to make expectations clearer to families and students, support understanding by non-content experts, or convey expanded information relevant to educator needs.

Proficiency Rubric Examples:

The Administrative Rules of Montana (item 10.55.603) states "Local school districts shall develop and implement a proficiency-based learning model that includes curriculum aligned to all content standards and appropriate learning progressions." As a supportive resource, this section provides sample proficiency rubrics that illustrate how students understanding of the mathematics content standard can be determined. These examples are **not mandatory** and are intended solely to guide districts in designing their own proficiency-based systems.

When assessing students on content standards, educators should consider multiple forms of evidence, including classroom observations, student self-assessments, projects or performance tasks, formative and summative assessments, and student portfolios. Using clear rubrics and proficiency scales can help educators consistently and accurately measure students' progress and proficiency in mathematics.

Notes on Proficiency:

- Proficiency is defined by clearly articulated learning objectives or standards. It is the ability to consistently demonstrate a sufficient level of knowledge, skill, or understanding to meet all specific standards or expectations.
- These targets are often broken into measurable criteria that describe what mastery looks like for a particular skill or concept.
- Proficiency is demonstrated through evidence of learning, such as assessments, projects, or performances that align directly with the standard.
- There are differing views on the quality versus quantity of evidence for mastery; some resources argue that a single demonstration of mastery suffices, while others argue that mastery should be established through multiple assessments. Districts are encouraged to explore and adopt a consistent methodology across classrooms that aligns with their pedagogical philosophy and instructional practice. Engaging in discussions at the local level about district and educator preferences greatly benefits students, educators, and families.

General Example of a Proficiency Rubric:

When determining students' proficiency in a math content standard, it may be useful to utilize a proficiency scale, such as the one provided below:

Beginning	Developing	Proficient	Mastery
The student shows minimal understanding or requires significant support.	The student demonstrates partial understanding but has not yet mastered each skill within the standard. The student may be able to independently engage in some skills but may require support in others. It may also be the case that the student requires minimal support across multiple skills.	The student is able to engage in each of the skills identified in the content standard with independence and accuracy.	The student may be able to engage in the skills identified in the content standard beyond grade level expectations. They may be able to engage in these skills in connection with other mathematical practice or content standards. The student exceeds the standard, showing deeper understanding or application.

Standard-specific examples can be found in each of the expanded guidance for each standard found on the following pages.

Achieving proficiency indicates that a student is ready to move on to the next level of learning. Although proficiency is the target goal, all students should be provided with opportunities to demonstrate and develop mastery through mathematically rigorous tasks.

Instructional Examples:

The instructional examples provided are designed to help educators, families, and other stakeholders better understand how grade 2 mathematics standards might be taught and applied in the classroom. While teachers are not required to use these examples, they serve as a valuable resource to support a variety of needs, including:

- **For New or Newly Assigned Teachers:** Offers insights into how grade 2 standards can be effectively taught in classroom scenarios.
- **For Experienced Grade 2 Teachers:** Highlights the instructional shifts introduced with the newly adopted standards.
- **For Instructional Coaches:** Refreshes their understanding of grade-level expectations and provides resources to support classroom educators.
- **For Families**: Provides clear examples of what students are expected to know and do in a classroom context.

These examples are **meant to illustrate possibilities, not prescribe methods**. Local school districts and educators maintain full authority over instructional decisions, ensuring that teaching aligns with the unique needs of their students and communities. Schools may adapt or choose entirely different examples that better fit their local context, and educators are encouraged to use their professional judgment.

Ultimately, these examples are a tool to **foster understanding, spark ideas, and support consistent interpretation** of the state standards.

IEFA Integration Examples:

The Office of Public Instruction (OPI) recognizes that educators, families, students, and Tribal representatives across Montana have expressed a need for trusted, high-quality instructional resources that integrate Montana's constitutionally mandated Indian Education for All (IEFA). These IEFA-integrated examples **offer educators an entry point and serve as introductory materials that can inspire further exploration and adaptation.** They **are not** intended to be a comprehensive lesson plan or the definitive approach to IEFA integration. Rather, they offer a **foundation** for educators who are beginning to incorporate IEFA principles or seeking fresh ideas for integration.

Educators are encouraged to use their **professional judgment** when utilizing these examples to recognize that authentic and meaningful IEFA integration is best achieved through **continued learning**, collaboration with **Tribal governments**, and consultation with **knowledgeable community members and Elders**. Where appropriate, educators should collaborate with Indigenous Knowledge Keepers or Elders to bring meaningful learning experiences to classrooms, taking care to **reciprocate shared knowledge through culturally appropriate gift-giving**. While Tribal representatives have reviewed these examples for appropriateness and cultural validity, educators should always strive to build connections with local tribal communities, Indigenous Knowledge Keepers, and local context.

OPI acknowledges that while it has sought collaboration with Indigenous individuals, tribal colleges, cultural committees, Montana educators, and the Montana Advisory Council on Indian Education (MACIE), these individuals do not always represent the full spectrum of philosophies, perspectives, and experiences of each member within a cultural group. Therefore, these documents may undergo revisions and updates should concern or opportunities for improvement be brought to the attention of the OPI regarding the representation of Indigenous Peoples or cultures, or the application of context in pedagogical or culturally responsive ways.

Furthermore, educators should consistently **apply the IEFA Framework**, including the **Multicultural Approaches and Essential Understandings**, to ensure that Indigenous perspectives are represented respectfully and accurately. **Local school districts** maintain authority over how IEFA is implemented, ensuring that instruction is responsive to the needs and contexts of their communities.

Each example includes several components:

- **Context and Connection:** Provides a very brief overview of the context. While this section will provide some general information and details, this section is intended as an **overview of information** that should be researched further to guide classroom instruction. By exploring these contexts further, educators are likely to deepen their understanding of the cultural elements discussed while strengthening classroom instruction. This section is not intended to be perceived as a comprehensive explanation of the cultural context and instead serves as an **entry point for further learning** by providing teachers with a **base-level understanding** and insight into an appropriate context to use in connection with the mathematical standard.

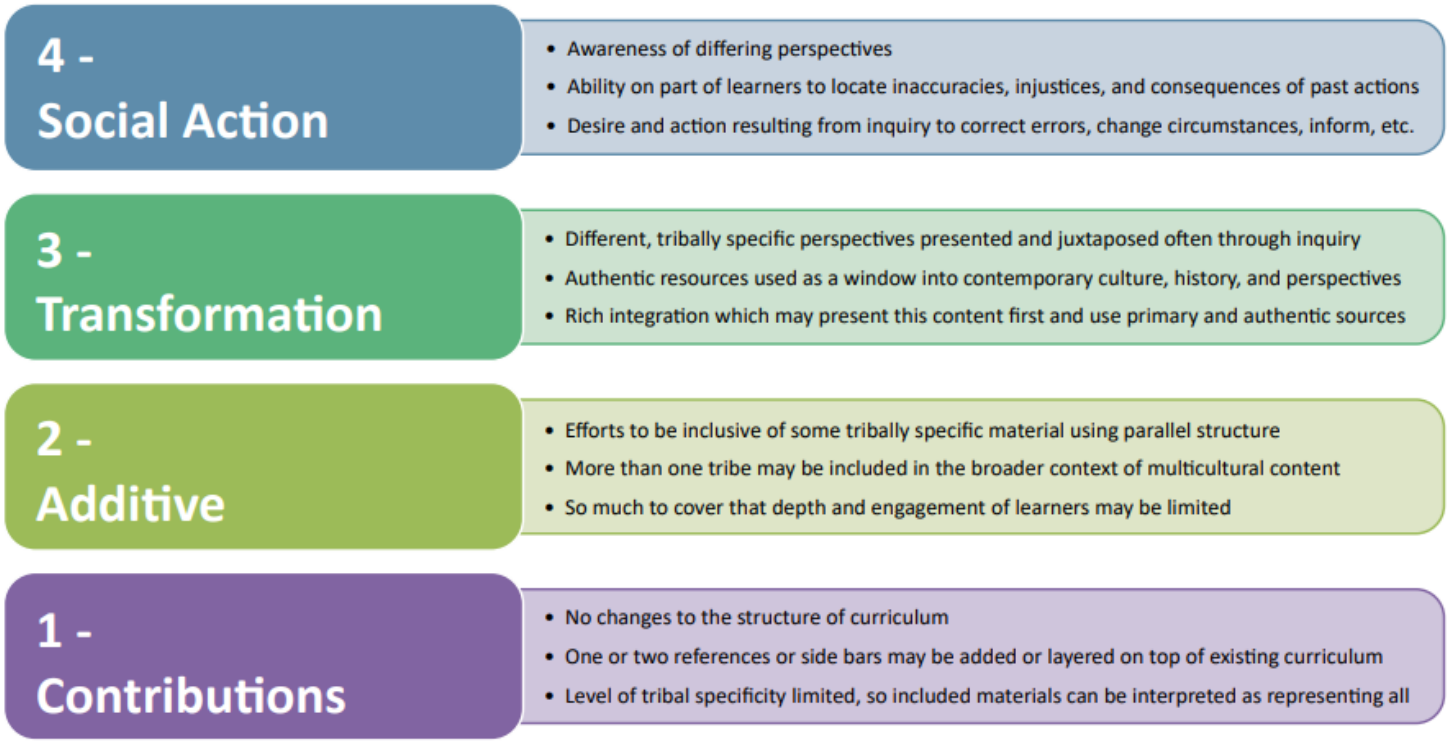
- **Task Description:** This section provides a **brief description of a task** that might engage the mathematical standard through the context provided. Teachers may consider modifying or expanding the task into a fully articulated lesson plan that is relevant to the context of their classroom, community, or the Indigenous community represented. These task descriptions are intended to **provide inspiration and opportunities** for increased IEFA integration in classrooms. Many teachers may notice opportunities to make additional connections across math concepts, content areas, or communities – OPI **enthusiastically encourages** teachers to apply their expertise and lived experiences to strengthen these tasks. Each task lists the preferred names of Tribes alongside commonly recognized names. For help with pronunciation of these, please visit the Montana Historical Society Tribal names and pronunciations resource.
- **Essential Understandings:** According to the Implementation Framework for Indian Education for All:

  > "The Essential Understandings were developed by a group of Indian educators representing each Montana tribe, who gathered to attempt to build consensus on a set of common core understandings. These Essential Understandings represent broad concepts common to Montana tribes all students should know. They are gateway standards, or entry points, into the rich histories, cultures, and perspectives of each Montana tribe. Essential Understandings are big ideas linked to rich content connected to each tribe individually. Sometimes, pressure to cover so much content can result in adding or layering material in the curriculum at a relatively superficial level in order to "check it off the list." This outcome can mean that a curriculum already deemed "a mile wide and an inch deep" just became wider and shallower. Developing a plan and a series of structures to support deeper levels of curriculum development helps to avoid the random addition of American Indian content to the curriculum." (OPI, 2025).

  There are seven Essential Understandings Regarding Montana Indians. Each IEFA example provided indicates which of the seven essential understandings are engaged in the task as it is written, however, local level engagement may vary depending on decisions made by educators in presentation and delivery.
- **Multicultural Approach:** The Implementation Framework for Indian Education for All states:

  > "Dr. James Banks identified four approaches to multicultural education implementation. Awareness of these approaches, or levels, can help teachers and curriculum developers gain greater depth in the curriculum" (OPI, 2025).

  There are **four multicultural approaches** that act as levels of depth for multicultural education. The graphic provided here, taken from the Implementation Framework for Indian Education for All, shows a rating scale for these levels.



The multicultural approach(es) identified in this section of the integration guidance merely present **the approach engaged based on the task description**. The teacher's individual application of the task may deviate from the task description, as personal preference, knowledge, and additional connections are engaged. This may therefore result in local practices that exceed or fall below the level indicated in this text. Teachers are encouraged to re-examine practical applications to establish the multicultural approach engaged during local instruction.

- **Relevant Resources:** Relevant resources have been provided for each integrated task. These resources have varied purposes including:
  - **Educator Resources:** Resources may be provided to expand educator awareness of a particular context.
  - **Student Learning Resources:** Student-friendly resources may be provided with the purpose of enriching or expanding student learning and teaching practices.

The types of resources provided range from model lesson plans and research to videos and stories. Each resource has been vetted for accuracy and relevancy. Where appropriate, OPI has provided resources that elevate Indigenous voices, such as recordings of Elders, traditional stories, Tribe-produced materials, etc. In cases where Indigenous-produced online resources could not be located or authenticated, resources from other academically reliable organizations such as museums, research journals, and government entities have been engaged.

Educators are always encouraged to vet these resources themselves for local relevancy and appropriateness, and to partner with Indigenous Knowledge Keepers, Elders, and Tribal representatives to continue to bring high-quality, culturally appropriate, and authentic materials and instruction to their classrooms.

OPI hopes that, by providing these IEFA recommendations for every standard, classroom teachers will feel supported, prepared, and encouraged to expand classroom integration of Indigenous cultural contexts and mathematical learning. Any teacher seeking further support is enthusiastically encouraged to reach out to the Indian Education Department at the Office of Public Instruction for guidance and resources.

OPI would like to express sincerest gratitude to each individual, Knowledge Keeper, Elder, committee, Tribal College, and Tribal Government that contributed valuable time and resources to vetting this document and aiding it in bringing these resources to educators in Montana. It would also like to thank every educator, family member, and student who has advocated for better applications of IEFA within mathematics through the generations.

MT.2.OA.1

Use addition and subtraction within 100 to solve one- and two-step problems in context involving all problem types. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

General Notes:

Second grade students are expected to extend their understanding of addition and subtraction by solving problems within 100 that require one or two steps and represent all addition and subtraction problem types. These include situations where quantities are joined, separated, combined, compared, or involve finding an unknown quantity in any position. While first grade focused primarily on single-step problems within 20, second grade students are expected to make sense of more complex situations by identifying the sequence of operations needed to solve a problem and explaining their reasoning.

Students should regularly solve problems using a variety of representations and strategies, including drawings, equations with a symbol representing an unknown quantity, number lines, base-ten blocks, place value strategies, and mental reasoning. Students should have opportunities to choose strategies that make sense to them while working toward efficiency, accuracy, and flexibility. During instruction, educators should encourage students to represent and discuss their thinking in multiple ways, though it should be noted that proficiency on this standard is demonstrated by successfully solving contextual problems instead of by using a prescribed representation or strategy.

Importantly, this standard requires educators to integrate cultural contexts to make learning more meaningful and relevant and to help students understand addition and subtraction as tools for reasoning in familiar settings.

Instructional Examples:

- The teacher might provide a contextual story problem such as “There are 62 students in the lunchroom. 24 students finish eating and head outside to play, then 15 more students enter the lunchroom. How many students are in the lunchroom now?” Students might represent the scenario using drawings, number sentences, manipulatives, equations, mental strategies, etc., and explain their reasoning.
- Students engage in an activity connected to local culture, such as “Our community recently held a pioneer days celebration. One of the events was a rodeo. Over the two-day event, the community sold 87 tickets. If 41 tickets were sold on the first day, how many were sold on the second?”
- The teacher might engage students in an activity where students create story problems for classmates to solve and represent these with in writing, with a picture, or using other forms of representation. Peers may then spend time writing number sentences, evaluating, and discussing results and problem-solving methods with each other.

IEFA Integration Example: Bear Paw Ski Bowl

Context and Connection:

On the Rocky Boy’s Reservation of the Annishinabe (Chippewa/Ojibwe) and Ne-i-yah-wahk (Plains Cree) peoples sits Bear Paw Ski Bowl. This ski area is one of just three areas in the United States located on tribally owned land. The ski bowl is operated through a non-profit partnership between the Tribe and dedicated volunteers from the community, which creates jobs, supports local businesses, and welcomes visitors to the reservation.

Lift tickets to the Bear Paw Ski Bowl are also priced around $25, while other areas typically charge between $70-200, Bear Paw provides expanded access to winter recreation for many. In addition to the affordability of the tickets, Bear Paw operates a ski shop to help aspiring skiers, families, and local school children access equipment, learn to ski, and enjoy the snowy outdoors.

This ski area is a modern example of how the community of the Rocky Boy Reservation exercises its sovereignty, makes economic decisions about the use of its Reservation (or Federal Trust) lands, and creates opportunities for children, families, and adults in the community and Montana.

Task Description:

The teacher might open the lesson by asking students if they have ever visited one of Montana’s ski resorts before, and what they know about how ski resorts work. They may provide some background information about ski resorts. For example, what purpose they serve, who uses them, and why they are a popular destination for many Montanans during the winter season. The teacher can show pictures of the Bear Paw Ski Resort and explain that this is the only one in Montana that is situated on reservation land – the Rocky Boy Reservation – which is home to the Annishinabe (Chippewa/Ojibwe) and Ne-i-yah-wahk (Plains Cree) peoples.

The teacher will then share some information about the ski resort, such as:

- Adult lift ticket: $25

- Child lift ticket: $20
- Kids under 8 ski free
- Community volunteers operate the resort and employees operate the lift
- Ski Shop opened in 2018 to help kids access equipment
- Equipment Rentals:
    - Adults: $20/day, $35/weekend
    - Kids: $15/day, $25/weekend
    - Helmets: $5/day
- Ski area is 40 minutes from Havre
- Snowpack averages around 140 inches in winter
- The number of skiers or snowboarders changes each weekend
- The ski area is only open weekends
- Local schools take trips to the ski area

Students are then invited to observe and wonder, perhaps prompted by the teacher with questions such as: “What questions do you have about Bear Paw Ski Bowl that we could answer using addition or subtraction?” The teacher should record all student-generated questions.

After questions are generated, the students should work in pairs or small groups to sort the brainstormed questions from the class into categories such as:

- Questions about cost (tickets, rentals, etc.)
- Questions about number of people (e.g., number of skiers, school groups, differences between number of visitors each weekend, etc.)
- Questions about time (e.g., driving, waiting, skiing, etc.)
- Questions about snow (e.g., new snow, melting snow, differences between weeks, etc.)

The teacher might then draw students back together to share their strategies for sorting and lead a discussion about which questions might be answered with the information provided, which require addition, subtraction, or multiple steps, and which might be too difficult or require missing information.

Students will then choose a question and refine it so that it can be answered mathematically. Some examples might include:

- How much would it cost for my family to ski there?
- How many skiers came if 42 people skied in the morning and 28 skied in the afternoon?
- How much snow is left if there were 100 inches in the morning, 15 inches fell, and 6 inches melted?
- How long does it take to travel to the ski area from Havre if we drive for 40 minutes and stop at the gas station for 20 minutes?
- How much does it cost for me and an adult to go snowboarding if we rent gear for the day?

Students should then use any strategy or classroom tools to solve their problem. These might include open number lines, tens/ones decomposition, counting on, base-ten drawings, counters, equations, tape diagrams, etc. Students should be directed to show their reasoning and be able to explain why they chose the strategy and how their solution makes sense in the context. They should then have an opportunity to present their question and solution to their peers, either through the pairing of groups, presentation to the class, or some other discourse-building activity. The teacher might lead a classroom discussion by asking students prompts such as: "Did anyone solve a similar question with a different strategy?", "Does the answer make sense for the context?", "What did we learn about Bear Paw Ski Bowl and the Rocky Boy Reservation through math today?", "How did addition or subtraction help you solve your problem?", "Why is the Bear Paw Ski Areas important to the Chippewa Cree community?", etc.

Optional extension activities could include planning a visit to the area within a fixed budget, using a map to approximate distances and modeling travel through contextual problems, tracking snowfall and snowmelt for a week using addition and subtraction, comparing similar questions to a local ski area (if developmentally appropriate), etc.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 4, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– This task rises to the contributions level through its engagement of the specific tribally operated ski area and its recognition of the contributions and community initiatives from the Tribes involved. With context relating to tribally specific practices, costs, and policies added to the math standard, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- Bear Paw Ski Bowl
- Montana Indians Their History and Location – Montana Office of Public Instruction (OPI)
- Bear Paw Ski Bowl – Havre High School, Bear Paw Ski Bowl

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** use addition or subtraction within 100 to solve one or two step problems in context without **intensive support**.
2. **Developing:** The student **can** use addition and subtraction within 100 to solve one and two step problems in context with **some support**.
3. **Proficient:** The student **can** use addition and subtraction within 100 to solve one and two step problems in context **with independence and accuracy**.

4. **Mastery:** The student **can** use addition and subtraction within 100 to solve one and two step problems in context **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.OA.2

Flexibly, accurately, and efficiently add and subtract within 20 using mental strategies.

General Notes:

This standard extends the fluency expectations established in Grade 1 from addition and subtraction within 10 to addition and subtraction within 20 using mental strategies. In this standard, students are expected to demonstrate fluency through flexibility, accuracy, and efficiency when mentally adding and subtracting within 20.

- **Flexibility** refers to a student's ability to choose and strategically use meaningful, creative, and innovative problem-solving strategies, relationships, or mathematical representations based on the numbers or context involved (Hickendorff et al., 2022).
- **Accuracy** means consistently arriving at the correct and precise answer.
- **Efficiency** involves solving problems productively and in a timely manner without taking unnecessary steps or delay.

To meet this standard, students might engage a variety of mental strategies including, but not limited to, making a ten, decomposing numbers, using the relationship between addition and subtraction (e.g., using 13 + 5 = 18 to solve 18 − 5), applying known doubles and near doubles, counting on or counting back when appropriate, or using known facts within 10 to derive unknown facts within 20. Students should be encouraged to reason about numbers rather than becoming overly dependent on isolated memorization.

While concrete or visual supports such as counters, ten frames, number lines, or drawings may be used during instruction or intervention to develop conceptual or contextual understanding, students should be increasingly capable of relying on mental reasoning to solve simple problems. By the end of Grade 2, students should be able to mentally add and subtract within 20 without routine dependence on physical models or counting strategies.

Instruction should support students in developing multiple strategies and recognizing which approaches are most efficient for particular numbers and contexts. This standard provides a foundation for fluent multi-digit computation, estimation, and algebraic reasoning in later grades.

Instructional Examples:

- The teacher might engage students in a game of math bingo where each square includes an addition or subtraction problem that students must evaluate using mental strategies and state the solution as an equation or share their process prior to placing the number tile on the bingo card.
- Students might participate in a number talk activity that involve addition and subtraction problems. After evaluating mentally, students share answers, compare methods, and discuss prompts such as “Which method seems the quickest?”, “Which method is the most creative?”, “Which answer do you think is correct? How do you know?”, etc.
- The teacher might facilitate a game of “Trash Ball” where teams or individuals compete to answer addition and subtraction questions using mental strategies. Though the game is played with many variations, the basic rule involves a point for correct answers and additional points for successfully tossing a ball of paper into a wastebasket.

IEFA Integration Example: Cultural Museum

Context and Connection:

Many of the Tribal Nations in Montana operate or partner with cultural museums, heritage centers, and interpretive sites that preserve and share Indigenous histories, traditions, and stories. Some museums are tribally owned and operated, such as the Three Chiefs Cultural Center on the Flathead Reservation, while others are managed collaboratively with state or federal agencies, like the Museum of the Plains Indian on the Blackfeet Reservation or Little Bighorn Battlefield on the Crow Reservation.

These museums serve as important community spaces where Tribal Nations represent their own cultures, curate their histories, and engage visitors in learning. They also provide rich opportunities for students to expand their understanding of the diversity of Indigenous experiences across Montana.

This task engages the context of a museum visit, which many students may have experienced first-hand, to create meaningful math problems. Teachers can adapt the task to increase the local relevance by using a local museum, cultural center, or heritage site to frame the activity. Including specific Tribal Nations whose histories, art, or cultural items are featured or displayed in that site can deepen cultural relevance and align with IEFA Essential Understandings.

Task Description:

The teacher will launch the task by ensuring that every student has an understanding of what a museum or cultural center is, perhaps by providing some pictures, or inviting a local community member, Knowledge Keeper, or historian, or by engaging students in a virtual museum field trip to provide additional context. They may also ask students questions such as: “Have you ever visited a museum, cultural center, or heritage site?”, “What did you see or learn?”, or “Why do you think museums are important to communities and Tribal Nations?”

After a brief discussion, the teacher should frame the math task “Imagine our class is visiting [local museum/cultural center]. Only 20 students can be inside a gallery at one time. Students enter and leave throughout the visit. We’re going to use mental math to figure out how many students are in the exhibit during different moments of the tour.” The teacher may find that students are curious about why only 20 students can be allowed at a time. They may choose to invite this inquiry or provide a rationale.

The teacher can present mathematical scenarios within the context, such as: “There are 12 students inside the exhibit. Three students from another class join, how many students are now in the exhibit? Explain the strategy you used.” or “Two students leave and eight more join. How many students are in the exhibit now? Did you use the same strategy as before or choose a new one? Why?”

Students should use a variety of mental math strategies such as counting on, making ten, composing or decomposing numbers, doubles or near-doubles, etc. Students should be prompted to share the answer, how they solved it mentally, and why their method was efficient for the numbers or context provided.

Pairing students up to discuss their solutions can deepen understanding, especially when paired with discussion prompts such as “What strategy did you use”, “How did you solve it efficiently in your head?”, or “Did your strategy change as the numbers changed?” Additionally, this activity could be extended to ask students to create their own museum-themed math problems, prompting them to swap and solve each other’s problems once ready.

To close, students can reflect on the mathematical learning and cultural context through questions such as: “Which mental math strategies worked best for you today?”, “How did you check your answers were accurate?”, “What made your strategy efficient?”, “Why are museums and cultural centers important to Tribal Nations and communities?”, “How do museums help share Indigenous histories and traditions?”, “Why do you think it is important for museums to work with the Tribes whose items and stories they display?”, “Whose stories are told in museums?”, “Why do you think it is important for Tribal Nations to present their own histories?”, etc.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 4, EU 6.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, this task would achieve the “contributions” level. With context relating to tribally specific practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the “additive” level. Connecting this task to reflections about the importance of museums to work in partnership with Tribes or opportunities for students to visit a site where students learn about the specific practices, traditions, stories, languages, and histories from Knowledge Keepers, drawing connections to contemporary experiences, activates a level of depth and engagement for learners that rises to the “transformation” level.

Relevant Resources:

- Montana Museums and Schools as Co-educators Guide – Montana Office of Public Instruction (OPI)
- National Museum of the American Indian Virtual Tour – Google Arts & Culture
- Virtual Field Trips – Buffalo Bill Center of the West

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** flexibly, accurately, or efficiently add or subtract within 20 using mental strategies without **intensive support**.
2. **Developing:** The student **can** flexibly, accurately, or efficiently add and subtract within 20 using mental strategies with **some support**.
3. **Proficient:** The student **can** flexibly, accurately, and efficiently add and subtract within 20 using mental strategies **with independence and accuracy**.
4. **Mastery:** The student **can** flexibly, accurately, and efficiently add and subtract within 20 using mental strategies **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.OA.3

Determine whether a group of objects, up to 20, has an odd or even number of members.

General Notes:

This standard introduces students to the concepts of odd and even numbers by exploring groups of objects up to 20 and builds off of students pre-existing awareness of the concepts of equality and equal shares. Students should first determine whether a quantity is odd or even using concrete strategies such as pairing objects or counting by twos. Students should begin to recognize that even numbers can be divided into two equal groups with no objects left over and that odd numbers always have one unpaired object through repeated practice.

Students should also have opportunities to practice writing even numbers as the sum of two equal addends during instructional practice (e.g., 12 = 6 + 6). Writing equations alongside concrete or pictorial models helps students develop abstract ideas and connect visual patterns to symbolic representations. This deepens their understanding of equal groups. Though odd numbers cannot be expressed as the sum of two equal whole-number addends, students may notice that they can be represented as “one more than” an even number (e.g., 13 = 6 + 6 + 1, or 13 = 6 + 7).

Instructional activities should emphasize reasoning and pattern recognition instead of memorization. Students should also have opportunities to explore odd and even numbers using concrete or pictorial representations such as manipulatives, drawings, arrays, ten frames, number paths, and equations. These foundational skills related to parity support students' future work with multiplication, division, factors, and early algebraic reasoning.

Instructional Examples:

- The teacher might provide students with collections of natural objects (e.g., pinecones, smooth stones, leaves, or fishing lures) and ask students to determine whether each collection has an odd or even number of objects by pairing them or counting by 2s. Students might explain their reasoning and, when appropriate, write an equation showing an even number as the sum of two equal addends.
- The teacher might facilitate a partner activity where students work together to determine whether groups of camping supplies can be shared equally among two campers. Students decide whether the quantity is odd or even and justify their reasoning.
- The teacher might facilitate a three-act-math task in which students determine whether a collection of library books can be shared equally between two shelves and justify whether the quantity is odd or even.

IEFA Integration Example: Indian Relay

Context and Connection:

Many individuals across Montana participate annually as contestants and spectators in an event called Indian Relay. Stories tell of the emergence of relay-style racing among Plains Tribal Nations approximately 400 years ago, and each Tribe holds distinct oral histories about its origin (Old Elk, 2017). Some accounts describe relays as connected to buffalo hunting, war games, communication needs, or horse-capturing practices that required speed, endurance, and teamwork among riders (Old Elk, 2017). While details vary by Tribe and region, these routinely emphasize values like horsemanship and cooperation.

Races today are organized as competitive events held annually at rodeos and celebrations across the Western Plains and Montana, including Browning, Dodson, Crow Agency, Great Falls, and Miles City. Races typically involve teams composed of three to four individuals - one rider, one to two holders, and a mugger. The rider completes laps around a track and switches horses between laps, the mugger, or catcher, catches and stops the incoming horse so the rider can mount a fresh horse for the next lap, and the holder works to keep fresh horses calm and readies them for the rider to mount. Men, women, and youth as young as seven are welcome to compete and teams often paint their horses and wear clothing and regalia that reflect Tribal affiliation, identity and pride in community.

Task Description:

The teacher should introduce Indian Relay to students by welcoming a local community member that has firsthand experience, or by sharing a video such as those provided in the resources below. The teacher might also prepare a student-accessible summary of key roles and rules drawn from the Horse Nations Indian Relay Council materials. Once students have a basic understanding of how an Indian Relay race is organized and the roles of each team member, they will explore different race scenarios and determine whether each situation results in an odd or even total.

For each scenario, the teacher briefly explains the situation or provides a written prompt for students to read such as: “Build one Indian Relay team and its horses using counters. How many people and horses are on the team? Is this number even or odd?” As a note to teachers, according to the Horse Nations Indian Relay Council, there are three to four individuals on a single team, each with a unique role, and there are two to three horses depending on the event. For example, a Kid Relay includes three ponies and four members, while a Junior Relay includes two horses and three members.

Students may then use manipulatives such as counters, cubes, laminated images, or other classroom tools to represent the scenario. They can determine the total number of people and/or horses involved, decide whether the total is even or odd, and explain how they know. The first scenario should be completed with teacher support and explicit encouragement to use strategies such as pairing objects, grouping by twos, noticing patterns, or writing number sentences.

Students can then work in pairs or small groups to explore what happens when multiple teams are on the track at the same time. During this exploration, students will model each situation, determine the total, decide whether it is odd or even, and consider whether they could provide their answer without counting every individual or animal. Groups should record their thinking and be invited to share the strategies they used. The teacher can support this discussion with prompts such as: “Which strategy helped you decide the fastest?” or “Which strategy helped you feel most confident in your answer?”

To extend exploration and increase rigor, the teacher may introduce additional scenarios inspired by the rule book, such as:

- In a Women’s Relay, each team includes two horses and three people. Is the total number on one team even or odd? How do you know?
- In a Kid Relay, each team has four people. Represent how many people would be on the track if four teams of four people were racing at the same time. Is this number odd or even? Explain.
- What is more advantageous – having an even number of team members or an odd number of team members? Explain your reasoning.

As a physical extension or introductory activity, the teacher might have students use hobby horses or yard sticks to model an Indian relay around the school track and following the structure of a real race. Alternatively, students might play the board game “Indian Relay,” the Blackfeet language game developed in partnership with Blackfeet Language Speakers and Native Teaching Aids.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 6, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, or without discussing how tribes have distinct stories about the origins of the event, this task would achieve the "contributions" level. With context relating to tribally or communally specific practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to reflections about how Indian Relay is similar or distinct from mainstream horse racing or how cultural values shape the structure of the sport, activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Indian Relay Horse Race Dubbed "America's Original Extreme Sport" – 60 Minutes, Columbia Broadcasting System (CBS)
- Indian Relay: America's First Extreme Sport – Buffalo Bill Center of the West
- Indian Relay Rules – Horse Nations Indian Relay Council
- Indian Relay – Public Broadcasting Service (PBS)
- Fast Horse – Handful of Films, Canadian Broadcasting Corporation (CBC)
- Indian Relay Board Game – Native Teaching Aids

Important note: The fast-paced nature of Indian Relay can result in serious injuries. Teachers are advised to preview resources to determine appropriateness for classroom learners.

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** determine whether a group of objects, up to 20, has an odd or even number of members without **intensive support**.
2. **Developing:** The student **can** determine whether a group of objects, up to 20, has an odd or even number of members with **some support**.
3. **Proficient:** The student **can** determine whether a group of objects, up to 20, has an odd or even number of members **with independence and accuracy**.
4. **Mastery:** The student **can** determine whether a group of objects, up to 20, has an odd or even number of members **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.OA.4

Use addition to find the total number of objects arranged in rectangular arrays.

General Notes:

This standard introduces students to rectangular arrays as a method for organizing, counting, and representing equal groups. Students should work with arrays containing up to five rows and five columns. They should also utilize repeated addition to determine the total number of objects. Students should begin to recognize that arrays provide an efficient way to count equal groups. This lays the foundation for understanding multiplication in later grades.

Students should write equations that represent the total as a sum of equal addends (e.g., a 4-by-3 array may be represented as 3 + 3 + 3 + 3 = 12 or 4 + 4 + 4 = 12). Instructional activities should provide students with opportunities to connect the visual structure of an array to repeated addition equations and recognize that the same array can be described by either rows or columns. Students should also explore arrays using a variety of concrete and visual models such as, but not limited to counters, tiles, egg cartons, geoboards, graph paper, digital manipulative tools, and contextual applications. These experiences support students' ability to recognize patterns, improve special reasoning, and build a conceptual connection between repeated addition and concepts like multiplication, division, and area in later grade levels.

Instructional Examples:

- The teacher may facilitate a modeling activity about a community garden where students arrange vegetables or flowers into rectangular garden beds with up to five rows and five columns. Students should determine the total number of plants by writing repeated addition equations that represent the rows and columns as well as practicing representing the solution in multiple ways.
- The teacher might provide an equivalent collection of small foods (e.g., candies, crackers, berries, or raisins) to each student and ask them to arrange the items into rectangular arrays. Students should determine the total by writing repeated addition equations and compare different arrays across the class that represent the same total. To facilitate this, the teacher might conduct a gallery walk protocol or similar activity.
- Students might investigate how a teacher or custodian arranges desks in equal rows and columns before the first day of school. Students might record their arrays, equations and observations in a math journal before discussing similarities or differences with a partner or the class.

IEFA Integration Example: Three Sisters Horticulture

Context and Connection:

Three Sisters horticulture is an agricultural practice with roots in the oral histories and knowledge systems of many Indigenous Peoples and Cultures across the North American continent. According to the United States Department of Agriculture (2024), the "Three Sisters" refer to corn, pole beans, and squash varieties that are grown together in a symbiotic system. In this planting method, corn provides the structure for the beans to climb, the beans help return nitrogen to the soil, and the squash spreads across the ground to help in the reduction of erosion, impediment of weed growth, and retention of moisture in the soil (USDA, 2024). Some Nations also incorporate a "Fourth Sister", which is dependent upon the region and tradition, that helps attract pollinators or provide additional protection from the elements. While historically utilized across many communities across North America,

the Three Sisters were not used in every Indigenous community or culture. The practice was used in the Mandan, Hidatsa and Arikara Nation, whose homelands include Montana, and who were once one with the Apsáalooke (Crow) Peoples (OPI, 2017).

Widely recognized, the stories, teachings, and growing practices connected to the Three Sisters system are varied across Indigenous Nations and communities. Different adaptations were developed to be responsive to the geography, climate, and environments of each homeland. This diversity of practice creates an opportunity for educators to partner with local Knowledge Keepers, Indigenous Farmers, or horticulture experts to learn about and compare the unique historic or modern practices of Montana's Indigenous Peoples. Three Sisters agricultural practices continue to be maintained in home gardens, Tribal communities, schools, and universities today. The system reflects Indigenous Ways of Knowing by providing a model of sustainable agricultural practices that care for the land through support for the long-term health of the soil and food system rather than exhausting the environment through monocropping practices.

Task Description:

The educator will begin by introducing the Three Sisters agricultural practice. They may choose to partner with Indigenous Knowledge Keepers Elders, or local horticultural, agricultural, or gardening experts in the area with knowledge of the Three Sisters system. The teacher may also read a traditional or children's story connected to the Three Sisters or show the Ted-Ed video, "When ancient wisdom beats modern industry by Rebecca Webster" which shares a Haudenosaunee (Iroquois Confederacy) story about the Three Sisters.

Students should understand that different Indigenous Nations and individuals have unique stories, cultural practices, and planting methods associated with the Three Sisters systems and that not every Tribe or community utilized this system. They may recognize that many versions of the practice involve growing different varieties of corn, beans, and squash together in shared planting spaces because the plants support each other's growth. Students should also understand that methods of cultivating these three plants have been used from time immemorial and continue to be practiced by many Indigenous and Non-Indigenous peoples today.

To transition to the mathematical task, the teacher should ask students whether they have ever had experience with helping to plant a garden or care for plants. Students might share experiences or observations before the teacher proceeds. The teacher can then explain that gardeners often organize planting spaces carefully to help crops grow well. They may introduce the vocabulary of rows and columns to students to support taskwork. During the task, students will explore garden plans inspired by the Three Sisters method and use arrays to determine how many planning spaces are in each garden.

The teacher will present various rectangular arrays (with no more than five rows and five columns) that represent garden plans. Some arrays may show crops planted in separate rows or columns, while others may show corn, beans, and squash growing together within the same planting space or garden mound. Students should observe these differences, but the mathematical focus should remain on determining the total number of planting spaces in each array.

The teacher might ask questions such as: "How many planting spaces are in this garden?", "How did you figure it out?", "How many rows are there?", "How many planting spaces are in each row?", or "How can repeated addition help us find the total?"

Students should show their thinking using drawings, repeated addition equations, counters, paper grids, or other manipulatives. Teachers might provide counters in three colors to help represent the three crops growing within the garden to support further discussion and exploration.

After students have explored several garden plans, the teacher should engage students in a discussion with prompts such as:

- "What do you notice about the gardens where the Three Sisters grow together?"
- "How are these garden plans different from the ones with separate rows?"
- "Why do you think people may have planted these crops together in the same space?"
- "Which garden plan do you think would work best if you were planting a garden? Why?"
- "What information would we need to know for sure which garden grows best?"
- "Why did you think people continued using this planting method for so many generations?"
- "What do you want to learn more about?"

The teacher should encourage students to understand that mathematics can help people investigate questions about gardens, agriculture, and how different planting methods work, even which the class may not yet have enough information to answer every question completely. This fosters interest that supports productive dispositions about math.

As an optional extension, students might create their own rectangular garden arrays using a fixed number of planting spaces provided by the teacher. Students can decide how to arrange their garden while keeping the same total number of planting spaces universal to the classroom. This facilitates comparison of different array arrangements while encouraging engagement in mathematical discussions about rows, columns, and totals. It can be differentiated by providing groups with different numbers of rectangles to arrange in order to reduce or increase the number of possible variations appropriately for the students.

Additional extension opportunities might include using the coloring pages provided in resources for an artistic connection or serving three sisters soup to students for a culinary or nutrition services connection. Alternatively, with teacher and community support, students might construct the seed packets to take home or participate in a seed-sharing or garden project connected to their local community.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 5, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, Transformation, or Social Action – Without context specific to a specific Tribe or Tribes, or without discussing the significance of these practices, this task would achieve the "contributions" level. With context relating to tribally or communally specific practices,

beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to comparisons of agricultural methods and considering why the Three Sisters system was used, activates a level of depth and engagement for learners that rises to the "transformation" level. For a "social action" level, students would need to apply their learning to a seed-sharing, community garden, or home garden project.

Relevant Resources:

- Molly of Denali – Story of the Three Sisters – Public Broadcasting Service (PBS)
- When ancient wisdom beats modern industry – Rebecca Webster, Ted-Ed
- Free Coloring Pages and Seed Packets of the 3 Sisters and Sage – Marlena Myles
- The Tale of Three Sisters – Montana Branch of the U.S. Department of Agriculture
- Three Sisters Soup Recipe – Indigikitchen, Mariah Gladstone

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** use addition to find the total number of objects arranged in rectangular arrays without **intensive support**.
2. **Developing:** The student **can** use addition to find the total number of objects arranged in rectangular arrays with **some support**.
3. **Proficient:** The student **can** use addition to find the total number of objects arranged in rectangular arrays **with independence and accuracy**.
4. **Mastery:** The student **can** use addition to find the total number of objects arranged in rectangular arrays **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.1

Understand one hundred is a unit composed of ten tens and that three-digit numbers represent amounts of hundreds, tens, and ones.

General Notes:

This standard requires students to extend their understanding of the base ten number system by introducing one hundred as a new unit that is composed of ten tens. This is a progression of grade 1 learning, where students learned that ten ones make one ten. Students should comprehend that units can be composed to form larger units or decomposed to make smaller units. This is the foundation of the place value system.

Furthermore, students should recognize that three-digit numbers represent quantities of hundreds, tens, and ones instead of viewing these as three separate digits. For example, students should understand that 346 represents three hundreds, four tens and six ones. One common misconception is that students will instead view 347 as the digits three, four, and seven placed side by side. Students should also understand the special case that 100 is a bundle of ten tens, called one hundred and that the numbers 100, 200, 300, … 800, 900 represent one, two, three, … eight, and nine hundreds with zero tens and zero ones.

These concepts should be developed through ample opportunities to practice composition and decomposition of numbers using concrete and visual models such as base-ten blocks, bundled craft sticks or straws, linking cubes, place value charts, drawings, or digital manipulative tools. This conceptual understanding of place value serves as a basis for students' ability to compare, order, round, and compute multi-digit numbers, and later work with decimals, measurement, scientific notation, and other concepts reliant on the place-value system.

Instructional Examples:

- The teacher might provide students with bundles of ten craft sticks or straws secured with rubber bands and ask them to count by tens. After students count ten bundles, the teacher can bundle the ten groups together and explain that ten tens make one hundred. Students may continue building and decomposing three-digit numbers using hundreds, tens, and ones while recording their thinking with place value charts, drawings, or equations.
- Students might participate in a "Build It, Draw It, Explain It" activity where they represent three-digit numbers using base-ten blocks, linking cubes, place value disks, or drawings. Students may explain how many hundreds, tens, and ones are represented and compare different ways to compose or decompose the same quantity through a Think-Pair-Share or Math Congress discussion.
- Students might investigate how bank tellers organize $1 bills into bundles to prepare cash for exchange or transportation. Students can use play money or strops of paper to bundle groups of ten ones into tens and ten tens into one hundred, then represent the total as hundreds, tens, and ones using place value charts, drawings, or base ten blocks.

IEFA Integration Example: Native Trout

Context and Connection:

The Confederated Séliš (Salish), Ksanka/Ktunaxa (Kootenai), and Qĩispé (Pend d'Oreille/Kalispel) tribes (CSKT) work to protect the native trout species through a variety of efforts, including managing fisheries and monitoring the populations of trout species. Lake Trout and Mysis Shrimp were introduced to Flathead Lake 100 and 50 years ago, respectively, and have devastated the native trout population. To address this, the Tribes make management decisions that integrate traditional and scientific knowledge (Native Fish Keepers, 2025). Part of funding this work involves harvesting and selling wild-caught fish from Flathead Lake in grocery stores across the Pacific Northwest. This enables the Tribe to support native trout conservation while also providing locally sourced protein to the community by offering an affordable and sustainable option for shoppers and by supplying fish to the local Food Sovereignty Program (Native Fish Keepers, 2025).

Task Description:

Teachers should begin by introducing students to the ecological issue in Flathead Lake caused by non-native lake trout that were introduced nearly 100 years ago, and the threat the increasing population has had to native trout species like Bull Trout (aay or łʔay) and Cutthroat Trout. They may choose to share a brief history of Bull Trout or read the book *Bull Trout's Gift.* The teacher will explain that the Confederated Séliš (Salish), Ksanka/Ktunaxa (Kootenai), and Qĺispé (Pend d'Oreille/Kalispel) (CSKT), concerned about this, established an organization called Native Fish Keepers, Inc. to protect native fish populations. This organization manages the population and funds these efforts through the sale of White Fish and Lake Trout across the Pacific Northwest. To recover the native trout population, this organization must harvest 143,000 Lake Trout per year.

For the math task, students should imagine they are helping to track the Lake Trout harvest over several days. The teacher can provide a catch tracker that shows three-digit numbers representing the number of fish caught across multiple boats or days (e.g., 128, 243, 356, 410, 589, etc.). For each number, students will be asked to build the number with base-ten blocks, bundled sticks, or place-value disks, identify how many hundreds, tens, and ones the number represents, and record the number in expanded form (e.g., 243 = 200 + 40 + 3).

The teacher might ask students to reflect on prompts such as: "How many tens make up one hundred?", "What does the four mean in 243?", "How is counting by hundreds different than counting by tens?", "If we combine ten tens, what new unit do we make?", "Why is it helpful to think in hundreds instead of counting by ones?", etc. The teacher can also prompt students to connect back to the context through prompts such as: "Why might it be helpful to understand how many hundreds of fish were caught on a given day?", "If one boat caught 243 fish and another caught 128, how many hundreds of fish were caught?", "How does understanding hundreds and tens help people track fish populations?", "Why is careful counting important for protecting native trout?", "What does this work show about how the CSKT care for the land and water?"

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 4, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, or without discussing the significance of native species, this task would achieve the "contributions" level. With context relating to tribally or communally specific practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to a comparison of Tribal and Non-Tribal resource management, or discussing why Tribes make specific decisions, may activate a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Farm to Tray Tour: Native Fish Keepers, Inc. – Montana Team Nutrition
- Native Fish Keepers, Inc.
- *Bull Trout's Gift* – Confederated Salish and Kootenai Tribes
- History of the Bull Trout – Confederated Salish and Kootenai Tribes
- Explore the River – CSKT Division of Wildlife, Recreation and Conservation

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** understand one hundred is a unit composed of ten tens and that three-digit numbers represent amounts of hundreds, tens, and ones without **intensive support**.
2. **Developing:** The student **can** understand one hundred is a unit composed of ten tens and that three-digit numbers represent amounts of hundreds, tens, and ones with **some support**.
3. **Proficient:** The student **can** understand one hundred is a unit composed of ten tens and that three-digit numbers represent amounts of hundreds, tens, and ones **with independence and accuracy**.
4. **Mastery:** The student **can** understand one hundred is a unit composed of ten tens and that three-digit numbers represent amounts of hundreds, tens, and ones **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.2

Skip-count by 5s, 10s, and 100s.

General Notes:

This standard builds off the counting skills established in earlier grades by introducing skip-counting by 5s, 10s, and 100s. Students are not expected to view skip-counting as memorizing a sequence. Instruction should instead emphasize the recognition of numerical patterns and understanding how each count changes the value of a number. Students should recognize that counting by 5s adds five each time, counting by 10s adds one ten each time, and counting by 100s adds one hundred each time, and that each count maintains the structure of the base-ten system.

Students should have opportunities to skip-count forward and backward from a variety of starting points and should not always begin at zero. Instruction should incorporate visual models such as hundreds charts, number lines, place value charts, base-ten blocks, and open number lines to

help students identify patterns and provide a rationale for why these patterns occur. Students should also connect skip-counting to contextual situations such as those that involve equal groups, measurement, money, and time.

Gaining proficiency with skip-counting helps students strengthen place value understanding and provides them with the prerequisite skills needed to engage with concepts such as multiplication, division, measurement, unit conversions, and proportional reasoning that are emphasized in later grades.

Instructional Examples:

- The teacher might facilitate a notice and wonder routine that engages images of numbered highway mile markers, fence posts, or trail markers spaced at regular intervals. Students can identify patterns as the numbers increase by 5s, 10s, or 100s and explain how they know the pattern will continue. They may also predict missing values.
- Students might investigate how a nurse or pharmacist organizes supplies (e.g., bandages, tongue depressors, gloves, etc.) into packages of 5, 10, of 100. Students can skip-count to determine the total number of supplies and discuss why organizing materials into equal groups might make counting more efficient or jobs easier.
- The teacher might facilitate a Slow Reveal of numbered livestock ear tags from a ranch. Students can then identify the skip-counting pattern and predict missing tag numbers.

IEFA Integration Example: Elk's Teeth Dresses

Context and Connection:

Elk's teeth were used by many Northern Plains Nations to adorn jewelry, regalia, accessories, and attire. One well-known and visually iconic example is the Elk('s) Tooth/Teeth Dress which was traditionally worn by women and children. Historical examples of these dresses, particularly from the Apsáalooke (Crow), Niitsitapi/Amskapi Pikuni (Blackfeet), and Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne) can be viewed today in museum collections or online exhibits. Contemporary Elk's Teeth Dresses may also appear at celebrations and community events occurring to this day.

Traditionally, Elk's Teeth Dresses symbolized status, pride, love, and care within a family. Each elk has only two ivory teeth, so a dress adorned with many represented years of careful collection, skilled hunting or trading, and the artistic prowess of dressmakers (Buffalo Bill Center of the West, 2015, 2025). Some Tribes, like the Lakota, Dakota (Sioux), viewed elk teeth as symbols of long life and gifted them to children as an expression of hope and care for their futures (Buffalo Bill Center of the West, 2015).

Task Description:

To prepare for the activity, the teacher should select several images of Elk('s) Teeth/Tooth Dresses from museum, online, or local collections and ensure that each image clearly identifies the Tribal affiliation of the individual or community represented where possible. Images can be printed, projected, or shared digitally. The teacher might also choose to invite a local Knowledge Keeper or Elder to share stories about elk, elk's teeth, or

articles adorned with elk teeth, or to play a short resource such as the audio from the Buffalo Bill Center of the West. The teacher might also share that elk's teeth could be used in trade. For example, as many as 100 teeth could be traded for one horse.

Students should understand that Elk's Teeth Dresses were symbols of the care, effort, and resources of a family. To help students understand this, it may be helpful to explain that while many people view wealth as having a lot of money, others, both past and present view wealth in different ways, such as having a good family, being a skilled hunter, or having a long life. In fact, elk teeth were given to children by adults to symbolize the hope that they would live a long life. To drive this home, the teacher might ask students to consider things that make them feel "rich" (e.g., a warm home, having siblings, or being a fast runner, etc.).

The teacher will then introduce the math focus by asking: "If we wanted to understand how many elk teeth are on a dress, how could we count them quickly without counting one at a time?" Students should discuss ideas and the teacher should guide them toward skip-counting as an efficient strategy.

Using one image at a time, the teacher and students should examine how the elk teeth are arranged and decide whether it would make sense to count by 5's, 10's, or 100's. Depending on classroom factors, in some cases, the teacher may provide images where teeth are already grouped; in others, students might help create groups by circling or marking sets. Students should then skip-count, record the total or estimate, and explain why they chose their strategy. The teacher might also lead a mathematical discussion by asking prompts such as: "Which strategy (5's, 10's or 100's) helped you count the fastest in this context?", "When was counting by 10's easier than counting by 5's?", "Would counting by 100's ever make sense? Why or why not?"

As an extension, students could reflect on how collecting elk teeth over time or making a dress showed care for children and members of a family, and how communities today show that children are valued and protected. They may also be invited to create their own patterns and arrays of elk teeth and describe the strategy they feel would help count these in the most efficient way.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 6.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, or without discussing the significance of the Elk Teeth Dress, this task would achieve the "contributions" level. With context relating to tribally or communally specific practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to a comparison of

designs or world views of different Tribes, the engagement of primary sources such as Knowledge Keepers, or reflection on differing world views about wealth, children and care, may activate a level of depth and engagement for learners that rises to the “transformation” level.

Relevant Resources:

- Example image for task (grouped by fives):



Image Source:

Married Woman, former wife of Rueben Black Boy, Blackfoot Indian.

Montana State Library.

Accessed: February 5, 2026.

- “Elk Tooth Dress” Collection or “Elk Teeth Dress” Collection – Montana State Library
- Museum Minute: Elk Teeth on a Crow Dress Displays Importance of Children – Buffalo Bill Center of the West
- Eye See Teeth – Buffalo Bill Center of the West
- Montana’s First Peoples: Essential Understandings Footlocker (Grade 4 lesson plans) – Montana Historical Society
- Powwow Guide – Montana Office of Public Instruction (OPI)

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** skip-count by 5s, 10s, or 100s without **intensive support**.
2. **Developing:** The student **can** skip-count by 5s, 10s, and 100s with **some support**.
3. **Proficient:** The student **can** skip-count by 5s, 10s, and 100s **with independence and accuracy**.
4. **Mastery:** The student **can** skip-count by 5s, 10s, and 100s **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.3

Flexibly count, read, write, and represent numbers to 1000.

General Notes:

In this standard, students are expected to count, read, write, and represent numbers to 1000 in flexible ways. In general, flexibility refers to a student's ability to choose and strategically use meaningful, creative, and innovative problem-solving strategies, relationships, or mathematical representations based on the numbers or context involved (Hickendorff et al., 2022).

- **Flexible counting** includes starting from different points (e.g., 386, 387, 388...), counting backward (e.g., 512, 511, 510...), or counting by multiples (e.g., 5s, 10s, and 100s). Second grade students should recognize patterns in the base-ten number system and use place value to count efficiently.
- **Flexibility in reading numbers** involves recognizing and interpreting three-digit numbers presented in different formats, such as numerals (e.g., 472), written words (e.g., *four hundred seventy-two*), or visual representations such as base-ten blocks, place value charts, or expanded form. Second grade students should recognize that the value of a digit depends on its place within the number.
- **Flexibility in writing** requires second grade students to represent three-digit numbers in multiple ways, including standard form, written words, expanded form, or place value representations. Students should become increasingly proficient in selecting the representation that best communicates their mathematical thinking.
- **Flexibility in representing numbers** means using a variety of visual, symbolic, verbal, contextual, and physical models (NCTM, 2014). Students should explain connections among representations and recognize that different representations can describe the same quantity.

As students evolve their understanding from two-digit to three-digit numbers, they begin to develop a deeper understanding of place value and the structure of the base-ten system. This essential concept provides them with skills often used in comparing, ordering, estimating, rounding, and computing with multi-digit numbers. It also sets students up for success in later work with decimals and other place-value systems.

Instructional Examples:

- The teacher might facilitate a *Which One Doesn't Belong?* routine using four representations of three-digit numbers (e.g., standard form, expanded form, base-ten blocks, word form, or place value charts). Students justify which representation, in their opinion, does not belong and explain the mathematical relationships among the remaining representations. Students share a variety of responses where students could form a reasonable justification for each. For example, students might see: 472, 400 + 70 + 2, a base ten block model of 472, and 427.

- Students might investigate a Montana wildlife population report (e.g., the number of elk, bighorn sheep, or trout in different regions) by reading, writing, and representing three-digit numbers in multiple ways. Students compare representations and explain which are most useful for communicating the quantities in the given context.
- The teacher might engage students in a classroom "museum walk" where stations display three-digit numbers using different representations, such as base-ten blocks, expanded form, word form, numerals, or pictorial models. Students rotate through the stations, identify the quantity represented, record equivalent representations, and discuss which representations make the value easiest to understand.

IEFA Integration Example: Elder Wood Programs

Context and Connection:

Community-based firewood programs exist across Montana, some through partnerships between Tribal Nations, local organizations, and federal agencies. These programs help ensure that Elders and individuals with disabilities have access to firewood during the winter months, while also supporting responsible land management and forest health.

Some notable examples include the Blackfeet Elderly Wood Program, the Crow Tribal Firewood Program, and the Chippewa Cree Tribe Senior Firewood Program, which reallocate wood byproducts from forest restoration projects conducted by the National Forest Service to community members in need. This work supports fire prevention, land stewardship, and helps Indigenous homes stay warm during long Montana winters. The Blackfeet Elderly Wood Program and Crow Tribal Firewood Program each have history of serving over 300 homes annually.

While some Tribal Nations have policies that allow able-bodied community members to gather their own firewood as part of stewardship practices, not all individuals are physically able to do so. Firewood programs help ensure that those who need it most receive care.

Task Description:

The teacher should introduce the task by providing background on Tribal firewood programs. They may choose to connect these to local community programs or winter assistance programs to increase local relevancy and student connection to the task. Students should understand that these programs exist to support Elders and individuals who may not be able to gather firewood independently, especially during harsh weather conditions. The teacher should then invite students to reflect on caring for others through prompts like: “What is something that is hard for you to do that someone helps you with?”, “How do you help others in your family, classroom, or community?”, “Why do you think communities make sure Elders stay warm in the winter?”, etc. These can help students connect the context to their lived experiences and prepare them for a deeper connection to the task.

For the math task, students should imagine they are helping prepare firewood deliveries for community members through a Tribal firewood program. The teacher can explain that counting and organizing firewood efficiently is important to make sure that everyone receives the amount they need. Students can use craft sticks, straws, paper strips, or other manipulatives to represent individual pieces of firewood. They should then bundle the pieces into tens and hundreds.

The teacher can then assign delivery amounts using a mix of forms such as: “Two hundred thirty pieces of firewood”, “415 pieces of firewood”, etc. For each delivery, students should build the amount using bundles, count the total, read the number aloud, write the number, and represent the number using hundreds, tens, and ones. As students work, the teacher can prompt discussion with questions such as: “How did bundling help you count more efficiently?”, “How did you know when to make a new bundle of 100?”, “What stayed the same when we regrouped?”, “Which representation helped you understand the number best?”, “When does counting by 100’s help us?”, etc.

Students can also reflect on the context through prompts such as: “Why is it important to organize firewood carefully in a program like this?”, “How does counting by hundreds help with big jobs?”, “What does this activity show about how communities care for Elders?”, “How does our community care for Elders?”, etc.

This activity could be extended through a reflection on how Tribal firewood programs arise through people noticing a need and taking actions to help others. The teacher might ask “What is one way we could help someone in our school or community?” and invite students to participate in a guided classroom-level action such as creating a “care plan” poster showing a way to help (e.g., helping younger students, checking on classmates, helping at home, etc.), drawing and labeling a collection plan (e.g., collecting books, warm clothing, classroom supplies, etc.), or writing or dictating a short message about why helping others matters to display for other students or community members.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 5.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Social Action – Without context specific to a specific Tribe or Tribes, or without discussing the significance of the program to communities, this task would achieve the “contributions” level. With context relating to tribally or communally specific practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the “additive” level. Connecting this task to a classroom, school, or community program that serves the needs of others and is inspired by the Tribal firewood programs may activate a level of depth and engagement for learners that rises to the “social action” level.

Relevant Resources:

- Wood for Life, Tribal Fuelwood Initiative – National Forrest Foundation
- Firewood Bank Assistance Program Grantees – Alliance for Green Heat
- *Red Parka Mary by Peter Eyvindson*
- *Morning on the Lake by Jan Bourdeau Waboose (Annishinabe)*

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** flexibly count, read, write, or represent numbers to 1000 without **intensive support**.
2. **Developing:** The student **can** flexibly count, read, write, and represent numbers to 1000 with **some support**.
3. **Proficient:** The student **can** flexibly count, read, write, and represent numbers to 1000 **with independence and accuracy**.
4. **Mastery:** The student **can** flexibly count, read, write, and represent numbers to 1000 **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.4

Compare two three-digit numbers using >, =, and < symbols.

General Notes:

This standard extends students' Grade 1 understanding of numerical comparisons from two-digit numbers to the Grade 2 expectation of working with three-digit numbers. Students are expected to accurately compare two three-digit numbers using the symbols > (greater than), = (equal to), and < (less than). Students should understand that comparisons begin with the greatest place value, not with individual digit comparison. For instance, when students compare 472 and 458, they should recognize that both numbers have 4 hundreds, then compare the 7 tens and 5 tens to reason that 472 > 458. A misconception may appear when students examine only the final digit and reason that 2 is less than 8 and believe 472 < 458.

Students should continue to connect each comparison symbol with its mathematical meaning: **>** means *greater than*, **=** means *equal to*, and **<** means *less than*.

Students should read comparison statements from left to right, just as they read written language. For example, 472 > 458 is read as "*Four hundred seventy-two is greater than four hundred fifty-eight.*" Instruction should emphasize that comparison symbols represent a relationship between quantities, not a notation to memorize. Concrete and visual models, such as base-ten blocks, place value charts, number lines, and expanded form, can be used to support students' understanding of why one number is greater than, less than, or equal to another. While students may initially compare numbers by modeling them, they should eventually transition to using place value reasoning using mental strategies.

Although the "alligator" or "crocodile" analogy is commonly used to introduce comparison symbols, students should develop a conceptual understanding of greater than, less than, and equal to, as mathematical relationships. Overreliance on the analogy may hinder students' understanding of inequality statements leading to misconceptions as comparison tasks and applications get more complex.

Instructional Examples:

- Students might compare attendance at two community events, such as county fairs, rodeos, powwows, school theatre, band, or sporting events. After reading the attendance totals, students can determine which event had more attendees, justify their reasoning using place value, and record the comparison using >, =, or <.
- The teacher might present a wildfire response scenario in which two fire crews have planted different numbers of tree seedlings as part of a forest restoration effort (e.g., 648 seedlings and 684 seedlings). Students compare the quantities using place value reasoning, explain how they determined which number is greater, and represent the comparison with the appropriate symbol.
- The teacher might facilitate an *Open Middle* task by asking students to use a given set of digits (e.g., 2, 4, 6, 8, 9, 0) to create two three-digit numbers that satisfy a condition such as ___ **>** ___ while making the difference between the numbers as small as possible. Students should have opportunities to compare strategies, justify their choices using place value reasoning, and discuss why multiple solutions may or may not exist.

IEFA Integration Example: Tribal Colleges

Context and Connection:

Montana is the only state in which every reservation has a Tribal college: Aaniiih Nakoda College, Blackfeet Community College, Chief Dull Knife College, Fort Peck Community College, Little Big Horn College, Salish Kootenai College, and Stone Child College. These institutions provide people with opportunities to earn degrees and certificates, prepare for career training, and participate in community learning courses. At many Tribal colleges, students can study heritage languages, traditional arts, and cultural histories while simultaneously pursuing academic and professional subjects. These colleges also serve as living expressions of Tribal sovereignty. They are often chartered under Tribal governments and, while they may partner with state universities, they are not extension campuses. Native and non-native students are served by these institutions, and they serve as an important education access point in Montana communities.

A note on accuracy: Enrollment numbers change year by year. For the most recent information, consider checking each college's current website/catalog or the National Center for Education Statistics to update counts when appropriate.

Task Description:

The teacher will begin by introducing Montana's Tribal Colleges as educational hubs that help people meet their learning and life goals. They will perhaps highlight a particular college with local or regional relevance through the introduction of pictures, maps, the college's website, or a classroom visitor.

The teacher may explain that numbers can help us describe and compare information about colleges. The teacher will present data from Montana Tribal Colleges such as the set provided below, in a student-friendly manner based on developmental and classroom appropriateness.

College	Salish Kootenai College (SKC)	Blackfeet Community College (BCC)	Fort Peck Community College (FPCC)	Aaniiih Nakoda College (ANC)	Stone Child College (SCC)	Little Big Horn College (LBHC)	Chief Dull Knife College (CDKC)
Total Fall Enrollment (Fall 2022)	619	346	697	115	281	296	221

Data Source: National Center for Education Statistics, 2023

Before engaging in formal comparison, the teacher might invite students to consider what the enrollment numbers represent. For example, they may ask questions such as "What does it mean for a college to have 281 students?" They might also prompt students to informally compare the number of students on a college campus with the number of students in their classroom or school using language like "more," "less," "greater than," "less than," or "equal to." They might then bridge to the task by asking, "How do we easily represent that relationship using symbols?", "How do we show one number is greater than another? Less than? The same as?"

Once students have a clear understanding of the meaning and uses of the symbols >, <, and =, they may present pairs of enrollment numbers to engage students in comparing three-digit numbers. They should ask students to first describe the relationship in words and then represent that relationship using symbolic language. For instance, "Stone Child College had 281 students enrolled and Chief Dull Knife College had 221 students enrolled. Which enrollment is greater? How do you know? Write a comparison statement to show the relationship between the two numbers."

Possible scaffolds may include sentence stems, visual references, and other supports that can help students connect the comparison language to the symbolic notation.

Students should be encouraged to justify their comparisons using place value or representational reasoning. After students have explored several number sets, as them to select one comparison and show the relationship in five ways:

1. **Physical/Concrete:** Build or model the numbers using base-ten blocks, connecting cubes, number rods, or other manipulatives.
2. **Visual/Pictorial:** Draw hundreds, tens, and ones, place the numbers on a number line, use a place-value chart, or create another visual representation.
3. **Symbolic/Abstract:** Write the comparison using >, <, or =.
4. **Verbal:** State or write the comparison using mathematical and/or place-value language, such as, "281 is greater than 221 because both numbers have 2 hundreds, but 281 has 8 tens and 221 has 2 tens."
5. **Contextual:** Explain what the comparison means in relation to the colleges, such as, "Stone Child College had more students enrolled than Chief Dull Knife College."

Teachers may select representations, provide students with choices, or use other representations that are familiar to students while maintaining opportunities for students to connect the five representations. They may also lead a discussion with the class that includes prompts such as: "Which place value did you compare first? Why", "When did you need to compare the tens or ones?", "How can you say the comparison in words?", "How does the symbol you used show the same relationship?", "Which representation made the relationship easiest for you to see?", "How does the enrollment of _____ college compare to the number of students in our school or classroom?", or "What did you learn about Montana's Tribal Colleges from the information we explored today?"

As a possible extension activity, students may be provided with a familiar quantity, such as the number of students in their classroom, as a benchmark for thinking about the magnitude of a Tribal college's enrollment. The teacher may ask students to describe what they notice about the relative sizes of these groups without using operations. For example, "Our class has ____ students. Salish Kootenai College had ____ students enrolled. About how many classes like ours would it take to make a group that large? How do you know?"

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 4, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, or without discussing the significance of Tribal colleges to communities or individuals served, this task would achieve the "contributions" level. With context relating to tribally or communally specific data, practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to a comparison of Tribal colleges to each other, or to non-Tribal colleges or a discussion about why Tribes operate their own institutions, may activate a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Enrollment and Degrees Conferred in Degree-Granting Tribally Controlled Post Secondary Institutions – National Center for Education Statistics
- Tribal Colleges – Montana University System
- How Tribal Colleges in Montana Bolster Local Workforce, Economy – Bozeman Daily Chronicle
- History of Tribal Colleges Part 1 and Part 2 – University of Oklahoma

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** compare two three-digit numbers using >, =, and < symbols without **intensive support**.
2. **Developing:** The student **can** compare two three-digit numbers using >, =, and < symbols with **some support**.

3. **Proficient:** The student **can** compare two three-digit numbers using >, =, and < symbols **with independence and accuracy**.
4. **Mastery:** The student **can** compare two three-digit numbers using >, =, and < symbols **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.5

Flexibly, accurately, and efficiently add and subtract within 100 using multiple strategies.

General Notes:

Grade 2 students are expected to demonstrate flexibility, accuracy, and efficiency when solving problems in a variety of ways including mental, visual, and written strategies.

- **Flexibility** refers to a student's ability to choose and strategically use meaningful, creative, and innovative problem-solving strategies, relationships, or mathematical representations based on the numbers or context involved (Hickendorff et al., 2022).
- **Accuracy** means consistently arriving at the correct and precise answer.
- **Efficiency** involves solving problems productively and in a timely manner without taking unnecessary steps or delay.

Students should build off strategies they developed in earlier grades and expand their effective use of place value reasoning. Appropriate strategies may include, but are not limited to, decomposing numbers by tens and ones, making a ten, compensation, using friendly numbers, counting on or back when appropriate, using the relationship between addition and subtraction, applying known facts, or using open number lines and other visual models to support reasoning. As students gain proficiency, they should begin to solve problems mentally with increasing frequency when the numbers lend to the efficient use of such strategies.

Instruction should emphasize that different problems often lend themselves to different strategies. Students should compare solution methods, explain why a particular strategy is most efficient for a given problem, and recognize that multiple valid approaches can lead to the same solution. The emphasis is on developing number sense and strategic thinking, not teaching a single preferred algorithm. The mastery of these skills establishes the foundation for fluent multi-digit computation, estimation, and algebraic reasoning in later grades.

Instructional Examples:

- The teacher might facilitate a *Number Talk* by presenting a problem such as 48 + 27 or 63 – 29. Students mentally solve the problem using different strategies, explain their reasoning, and compare the efficiency of approaches such as compensation, decomposing by place value, or making friendly numbers.
- Students might investigate a community food drive (such as Can the Cats) by determining the total number of donated food items collected by two classrooms or the number remaining after donations are distributed. Students solve the problem using more than one strategy, compare the efficiency of each approach, and justify which strategy they would choose in a similar situation.
- Students might solve several addition and subtraction problems within 100 and sort them by the strategy they chose (e.g., make a ten, compensation, decompose by place value, counting on, or using related facts). Students compare their choices with classmates and discuss why different strategies may be more efficient for different numbers.

IEFA Integration Example: Fur Trading

Context and Connection:

The fur trade played a vital role in forming the economic, cultural, and geographic landscape of Montana as it stands today. Trade routes of the 1700s and 1800s connected Indigenous communities, European traders, and settlements across the state and continent. These routes usually followed major river systems and trails to link the Great Lakes, Canadian Prairies, and Northern Rockies (The Canadian Encyclopedia, 2023). Trade items were not limited to animal pelts, and included a range of other items like tools, textiles, beads, food, horses, and cultural knowledge.

The histories and cultures of every Tribe in Montana were affected by this exchange in profound and unique ways, and the effects can be explored through the oral and written histories of each tribe. Trade relationships and outside policies affected Tribal lands, economies, and relations, in ways that continue to shape communities to this day. This task will be framed around the role that the Annishinabe/Métis (Little Shell Chippewa) played in the trade industry but could be revised to increase relevancy to other Tribes in Montana. Because many Métis were often fluent in both Indigenous and European languages, and knew how to navigate multiple cultural systems, they played important roles as traders, guides, interpreters, and intermediaries between communities. Trade required careful counting, recording, and negotiation, serving as a relevant context for students to apply addition and subtraction within 100.

Task Description:

To introduce the task, the teacher should provide some age-appropriate background on the history of trade in Montana and the important role of the Annishinabe/Métis in trade networks. Where reasonable and appropriate, the teacher might invite Knowledge Keepers or Elders to share oral histories about trade, or might utilize resources from Tribes, a local cultural center, museum, or the Montana Historical Society. Students should understand that trade shaped communities across the Northern Plains and that each Tribe has its own history and experiences related to trade.

The teacher should then introduce students to the Red River Cart, which is a form of transportation closely associated with the history of the Métis, trade, and travel across the Northern Plains. Consider providing images or other visual resources so that students can understand how these carts were historically used to transport goods and traverse great distances.

The teacher may transition to the math task by explaining that students will model mathematical situations involving the harvesting and exchange of furs along historic trade routes of the 1800s. Students will rotate through stations, solve addition and subtraction problems within 100, and represent their thinking in different ways as they work. As they engage with the task, students should consider how different representations can help to show the same strategy and support them in communicating their reasoning.

Implementation of this task will likely differ depending on where students are in the local instructional sequence. Teachers should prioritize strategies and representations students have already encountered during the year. The task may also be engaged as an opportunity to introduce a limited number of new representations by explicitly connecting them to mathematical strategies students already understand.

Possible addition and subtraction strategies that could be used in this task may include: composition and decomposition into tens and ones, addition and subtraction of tens then ones, making a ten using friendly numbers, counting on or back, using known facts to reason about unknown facts, or other mathematically valid strategies familiar to students.

Students might represent these strategies using familiar manipulatives and representations such as (but not limited to) bundled craft sticks, base-ten blocks, connecting cubes, drawings of tens and ones, open number lines, place value charts, or equations. Teachers should select the representations that best support students in making connections between their thinking and how that thinking can be modeled.

Each scenario should begin with the same context: A Métis family is traveling along a historic trade route with a Red River cart full of pelts to trade. As they travel between the trading posts and settlements, they trade some pelts and add others to their inventory. They want to keep an accurate record of their quantities.

Each station should represent a different Métis settlement location along these trade routes. A sample problem might be framed as: “A Métis family brings 72 pelts to a trading post. They trade 29 pelts and later add 18 more to their inventory. How many pelts do they have now?” Teachers may organize stations around different representations they selected as most appropriate for their students. For example:

Station 1 – Beaver Creek Settlement: Concrete Model
Students use familiar manipulatives to model their strategy. They then record how the model shows their addition or subtraction process.

Station 2 – Browning: Open Number Line
Students represent their strategy using jumps on an open number line. They label jumps to show how the quantities were composed or decomposed.

Station 3 – Deer Lodge River: Draw and Label
Students draw and label a visual representation of their thinking (such as tens and ones) and connect the drawing to the quantities in the problem.

Station 4 – Flat Willow Creek: Equations
Students record symbolic equations that represent the steps in their strategy and explain how the equations connect to their thinking.

Important Note: The settlement names listed are located in present-day Montana and represent only a small portion of historic Métis communities. Teachers may explore brief histories of these locations using resources such as the Virtual Museum of Metis History and Culture (Barkwell, 2016). Teachers might consider sharing developmentally appropriate histories at each station to increase student awareness of the context.

At each station, students should record their solution and how the representation shows the strategy they used. Depending on student readiness, the teacher may also ask students to explain why the strategy worked or draw connections between representations used at different stations.

After rotations are complete, students should engage in a teacher-led discussion that includes reflection questions such as: "What stayed the same when you represented your thinking in a different way?", "Where can you see the tens and ones in each representation?", "How does the number line show thinking that you could also show with manipulatives or a drawing?", "Where can you see your strategy in the equation?", "Which representation helped you see or explain your strategy most clearly? Why?", "Did anyone solve a problem using a different strategy?", or "When might one strategy or representation be more helpful than another?"

As an extension, students could be challenged to create their own fur trade scenario involving addition and subtraction within 100. They should write a clear story problem, solve it using a familiar strategy, and represent their thinking in at least two ways. They may also then exchange problems with a classmate to solve, compare solutions, and discuss how different representations can be used to show similar or different strategies.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 5.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– Without context specific to a specific Tribe or Tribes, or without discussing the impact of trade on the Tribe and its peoples or vice versa, this task would achieve the "contributions" level. With context relating to tribally or communally specific data, practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- Beaver, Bison, and Black Robes – Montana's Fur Trade (1800 – 1860) – Montana Historical Society
- Fur Trade Route Networks – The Canadian Encyclopedia
- The Montana Fur Trade (Fourth Grade Model Unit) – Montana Historical Society

- Montana & Metis History - ArcGIS
- The Metis Homeland: Its Settlements and Communities – The Virtual Museum of Metis History and Culture

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** flexibly, accurately, or efficiently add or subtract within 100 using multiple strategies without **intensive support**.
2. **Developing:** The student **can** flexibly, accurately, and efficiently add and subtract within 100 using multiple strategies with **some support**.
3. **Proficient:** The student **can** flexibly, accurately, and efficiently add and subtract within 100 using multiple strategies **with independence and accuracy**.
4. **Mastery:** The student **can** flexibly, accurately, and efficiently add and subtract within 100 using multiple strategies **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.6

Add up to four two-digit numbers using multiple strategies.

General Notes:

This standard requires students to extend their understanding of addition by determining the sum of up to four two-digit numbers using multiple strategies. There is a remaining emphasis on flexibility as students are encouraged to recognize number relationships and strategically organize numbers to simplify computation and select appropriate strategies for the specific problem.

Students should build upon previously developed addition strategies while extending their use of place value reasoning. Appropriate strategies may include but are not limited to decomposing numbers into tens and ones, making friendly numbers or tens, compensation, using associative and commutative properties to group numbers strategically, applying known facts, and representing thinking with open number lines, place value models, equations, or other representations.

Instruction should encourage students to look for combinations that make computation easier (e.g., pairing 27 + 23 to make 50 before adding the remaining numbers) and to explain why particular groupings are helpful. Students should recognize that the order in which numbers are added does not change the total. This allows them to reorganize addends to solve problems more strategically and begin to develop a basic awareness of the commutative property of addition. Developing these flexible approaches supports the development of numerical fluency and prepares students for concepts in later grades such as efficient multi-digit computation, mental mathematics, estimation, and more advanced algebraic reasoning.

Instructional Examples:

- The teacher might facilitate a *Three Reads* routine by presenting a contextual problem involving four quantities, such as the number of books collected by four classrooms or the number of fish observed in four sections of a stream. Students should first focus on understanding the situation, then identify the quantities, and finally, determine an efficient strategy for finding the total.
- Students might participate in a *Strategy Swap* by solving the same four-addend problem individually before exchanging solutions with a partner. Students identify the strategy their partner used, discuss how the numbers were grouped, and compare the efficiency of different approaches.
- The teacher might engage students in a *Which Strategy Works Best?* discussion by presenting a problem such as 28 + 12 + 35 + 25. Students can justify different solution paths, such as making friendly numbers (28 + 12 = 40 and 35 + 25 = 60) or decomposing into tens and ones and discussing why some strategies require fewer steps than others.

IEFA Integration Example: Antelope Harvest

Context and Connection:

Across Montana, hunting remains a cultural practice and integral part of the food system for many communities. In Montana, general antelope hunting season typically takes place in October and November and some Tribes host hunts during this time using permits or lottery systems. Seasonal hunts for animals such as antelope reflect longstanding relationships with the land and animals that sustain human life. Permit limitations assist in the responsible management of the population to ensure pronghorn antelope remain present on Montana's plains for years to come. Stories such as *How Summer Season Came* from the Indian Reading Series also help illustrate the role of seasonal change and animals within Indigenous worldviews.

Today, several Tribal Nations in Montana are strengthening their food sovereignty through the creation of tribally owned meat processing facilities. The Nakoda/Nakona (Assiniboine) and Lakota, Dakota (Sioux) of the Fort Peck Reservation, the Nakoda/Nakona (Assiniboine) and A'aninin (Gros Ventre) of the Fort Belknap Reservation, the Séliš (Salish), Qĺispé (Pend d'Oreille/Kalispel), and Ksanka/Ktunaxa (Kootenai) of the Flathead Reservation, and the Niitsitapi/Amskapi Pikuni (Blackfeet) of the Blackfeet Reservation have all established, or are establishing, facilities as of early 2026. These facilities, many of which are supported by USDA funding, allow locally harvested meat to be processed and distributed within local food networks to ensure that the needs of the community are met. These represent modern expressions of Tribal sovereignty and connect traditional harvesting practices with contemporary systems of food distribution and economic advancement.

Task Description:

To begin the task, the teacher should connect students to the context of seasonal hunting and Tribally operated meat processing facilities in Montana. They might choose to provide a brief explanation themselves or strengthen the accuracy and relevance by inviting a representative of the Tribe, Knowledge Keeper, Elder, or food sovereignty program representative to the classroom. The teacher should ensure that students understand that

communities carefully track harvested meat that is donated to or collected by the Tribe so it can be shared responsibly and processed safely for families and Elders. Students should also understand that planning and accurate records keeping are vital components of community food systems.

The teacher will then introduce a scenario: “During antelope hunting season, several hunting groups from the food sovereignty program return to process harvested meat. Before the meat can be processed and shared, the total amount must be calculated so that community and program leaders can plan distribution.”

Students will work in partners or small groups to solve harvest planning scenarios such as: “Four groups return with the following amounts of pronghorns harvested: 38, 41, 12, and 29.” Students must then:

- Find the total amount of harvested animals independently using any strategy they choose,
- Discuss strategies across small group peers,
- Select at least two methods and create a visual and numeric representation of their thinking for each, and
- Explain which strategy felt the most efficient and why.

Teachers should encourage multiple strategies such as pairing numbers to make tens, compensation, open number lines, base ten drawings, standard algorithms, place value addition, etc. This task could be repeated as many times as necessary and appropriate. The teacher might expand this task to include elevated discourse through prompts such as: “Which numbers did you choose to combine first? Why?”, “How did (insert strategy) help you work efficiently?”, “Did anyone use a different strategy but arrive at the same answer?”, “How can we check our total to ensure we are accurate?”, “When adding several numbers, what makes our process efficient?”, etc.

An extension task could also be created where students must craft their own scenarios, solve using at least one strategy, exchange with a partner, and compare approaches to determine if the same result was achieved. Alternatively, students could be prompted to consider the role of accurate records keeping in ensuring resources are allocated correctly, overharvesting does not occur, or how local meat processing plants can support communities across Montana, including Tribal communities.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 4, EU 6, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, or without discussing the significance of hunting or food sovereignty, this task would achieve the “contributions” level. With context relating to tribally or communally specific data, practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the “additive” level. Connecting this task to a

movement beyond “hunting is food” to understanding governance, planning, and stewardship, or connection to themes of community care and health may activate a level of depth and engagement for learners that rises to the “transformation” level.

Relevant Resources:

- How the Sumer Season Came – Indian Reading Series, Education Northwest
- Blackfeet Nation is Taking Back the Food System – National Resources Defense Council
- FY 2024 Indigenous Animals Harvesting and Meat Processing Grant Program Recipients – United States Department of Agriculture
- Pronghorn (Antelope) – Montana Fish, Wildlife and Parks
- Pronghorn Coloring Page – National Parks Service

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** add up to four two-digit numbers using multiple strategies without **intensive support**.
2. **Developing:** The student **can** add up to four two-digit numbers using multiple strategies with **some support**.
3. **Proficient:** The student **can** add up to four two-digit numbers using multiple strategies **with independence and accuracy**.
4. **Mastery:** The student **can** add up to four two-digit numbers using multiple strategies **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.7

Add and subtract within 1000 using multiple strategies.

General Notes:

Students’ understanding of addition and subtraction is extended in this standard from working with two-digit to working with three-digit numbers. Students are expected to solve problems within 1000 using multiple strategies that build on their understanding of place value, properties of operations, and relationships between numbers. There is still an emphasis in this standard on developing conceptual understanding through flexible reasoning to prevent students becoming over-reliant on a single computational method.

Students should apply and extend previously learned strategies while reasoning about hundreds, tens, and ones. Appropriate strategies may include but are not limited to decomposing numbers by place value, composing and decomposing units when appropriate, compensation, making friendly numbers, using the relationship between addition and subtraction, applying known facts, and representing thinking with open number lines, place value drawings, equations, or concrete models.

Students should recognize that different strategies may be more effective depending on the numbers involved and have opportunities to compare strategies. The standard requires students to use multiple strategies however; strategies should not be used for strategies sake alone. Instruction should be built toward increasingly efficient methods that are grounded in conceptual understanding. Traditional algorithms may be introduced as one strategy among many but should be connected to students' understanding of place value reasoning, not taught as isolated procedures.

Students' abilities to develop flexible strategies for adding and subtracting within 1000 establish the basis for concepts such as multi-digit computation, estimation, decimal operations, and algebraic reasoning in later grades.

Instructional Examples:

- The teacher might facilitate a *Number String* activity designed to highlight place value relationships for students. For example, students may solve 298 + 2, 298 + 12, 298 + 102, and 298 + 202, and discuss how the structure of each expression influences their strategy and how previous problems support later ones.
- Students might participate in an *Error Analysis* activity by examining several student solutions to the same addition or subtraction problem. Students should identify correct reasoning, locate misconceptions, and explain how place value supports a more accurate solution. This can be supported by sentence stems and mathematical discourse strategies.
- Students might solve a community planning problem, such as determining the total number of trees planted in several local neighborhoods or parks or by calculating how many pounds of food remain after distributions at a community food bank. Students can represent their thinking using more than one strategy, compare approaches with classmates, and explain why they selected a particular method. This can be supported by strategies such as a gallery walk, carrousel activity, or other visible thinking strategy.

IEFA Integration Example: Animal Crossings

Context and Connection:

Highway 93 runs through the Flathead Reservation which is home to the Séliš (Salish), Qĺispé (Pend d'Oreille/Kalispel), and Ksanka/Ktunaxa (Kootenai) Peoples. When plans were developed to improve and expand the highway, the Confederated Séliš (Salish), Ksanka/Ktunaxa (Kootenai), and Qĺispé (Pend d'Oreille/Kalispel) (CSKT) partnered with the Montana Department of Transportation to address concerns brought by Tribal leaders and community members about the impact the roadway could have on wildlife, land, and community well-being. Through this collaboration, this stretch of roadway was redesigned as "The People's Way" to incorporate wildlife crossing structures and fencing with the intention to protect wildlife and improve the safety of people traveling in this area.

Sections of this highway were reconstructed between 2005 and 2010 to include wildlife crossing structures and fencing to help animals move more safely across the highway and to reduce incidences between vehicles and wildlife. The completed project included structures across 39 locations and approximately 8.7 miles of fencing. This work continues to this day, with additional crossing improvements planned for 2027.

Salish-Kootenai, artist and educator Corky Clairmont provides some of this context in an interview with the Office of Public Instruction where he describes how these concerns inspired his artwork *Split Shield.* His perspective highlights Indigenous worldviews that are grounded in respect for the land and for the animals that live on it. The wildlife crossings along Highway 93 demonstrate Tribal sovereignty in action, and monitoring efforts provide data about how the crossings are functioning. The data used in the following task have been simplified from these monitoring reports to better align with developmental expectations for Grade 2 students.

Student-Friendly Terminology: The Montana Department of Transportation uses the term *wildlife-vehicle collision* when reporting and studying these events. This task uses the term *wildlife-vehicle incident* because the review committee felt it held a more appropriate connotation for the age group. In this task, an incident means an event in which a vehicle and a wild animal come into contact. Neither *incident* nor *collision* necessarily means that a person was injured.

Trauma-Informed Consideration: Some students may have personal or family experience with wildlife-vehicle incidents. Teachers should be sensitive to student experiences when introducing this context and avoid emphasizing injury or graphic outcomes. The task is intentionally framed around how communities can use thoughtful design and mathematics to make roadways safer for both people and wildlife.

Task Description:

To frame the task, the teacher should show the video *Salish Kootenai Artist Corky Clairmont* from time 03:26 to 07:37. In this segment, Mr. Clairmont discussing the meaning behind his artwork *Split Shield,* community concerns about Highway 93, and the purpose of the animal crossings along the road. Students should reflect on prompts such as: “Why might people be concerned about animals and highways?”, “Why might crossings matter?”, “Who or what should be considered when a highway is built?”, etc.

The teacher may also consider showing students an image of one or more structures along Highway 93 so they can visualize how the structures help wildlife move across or beneath a roadway safely. The *People’s Way Partnership*, listed in the resources below, provides these visual resources and photographs.

The teacher can then transition to the math task using a statement such as: “The Confederated Salish and Kootenai Tribes worked with the Montana Department of Transportation to design Highway 93 within the Flathead Reservation in a way that protects both people and animals. Today, we will use addition and subtraction to explore data about wildlife-vehicle incidents before and after these crossings were built.”

Teachers should provide students with the data points provided below in whichever format is most accessible for their classroom (e.g., chart, cards, manipulatives, bullet points, tables, etc.). Students should understand that the numbers represent the approximate number of vehicle incidents with wildlife reported in a single month monitored across four separate sections of Highway 93, both before and after the crossings were constructed.

	Area 1	Area 2	Area 3	Area 4
Before Wildlife Crossings	28 incidents	31 incidents	24 incidents	22 incidents
After Wildlife Crossings	8 incidents	9 incidents	7 incidents	11 incidents

Note: The data above represent simplified approximations of monthly averages based on multi-year monitoring data from Highway 93 North. The values have been scaled to align with developmental expectations for Grade 2 and do not reflect exact counts from a specific month.

Students should:

1. Find the total number of incidents before crossings were installed.
2. Find the total number of incidents after the crossings were installed.
3. Determine how many fewer incidents occurred after the crossings were installed. Use these totals to find the difference.
4. Consider: What do the data suggest about whether the crossings helped reduce wildlife-vehicle incidents? How do you know?

To address these questions, students should solve each part using at least two strategies, represent their thinking using models they are familiar with, and explain their reasoning. Teachers might provide sentence stems to support student reasoning or discourse such as: "I grouped ____ and ____ because…", "This strategy is efficient because…", "I checked my answer by…", or similar prompts.

After students have had an opportunity to engage in mathematical exploration, the teacher can facilitate a discussion using prompts such as: "Why did Tribal and community leaders want crossings built?", "Who helped design the highway?", "Why is it called the People's Way?", "How does math help us decide if something is working?", "Which strategy felt the most efficient? Why?", "Did different strategies lead to the same answer?", "How can we check to be sure our totals are correct?", etc.

If additional practice or time is desired, the task could be expanded to:

- Ask students to compare areas through questions such as, "How many fewer incidents were reported in Area 1 after the crossings were constructed?" or "Which area showed the greatest difference?"
- Ask students to add distances between crossings using information from the *People's Way Partnership* resource.
- Invite students to create a drawing inspired by Clairmont's work *Split Shield* that incorporates representations of highways and crossings.
- Have students write a short reflection explaining how animal crossings help humans and animals.
- Provide a simple map and ask students to visually locate marked crossing areas. (The OPI Maps Can Help Us Lesson Plan may provide additional support for this)

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 4, EU 5, EU 6, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Additive, or Transformation – With context relating to tribally or communally specific data, practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to an analysis of evidence and impact, consideration of Indigenous leadership in infrastructure design, or framing highways as shared spaces between animals and humans may activate a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Salish Kootenai Artist Corky Clairmont – Montana Office of Public Instruction
- People's Way Partnership – Montana State University and Western Transportation Institute
- Partnership Report (Data Table pg. 73) – Montana State University and Western Transportation Institute
- US 93 Wildlife Crossing Structure Monitoring – Montana Department of Transportation

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** add or subtract within 1000 using multiple strategies without **intensive support**.
2. **Developing:** The student **can** add and subtract within 1000 using multiple strategies with **some support**.
3. **Proficient:** The student **can** add and subtract within 1000 using multiple strategies **with independence and accuracy**.
4. **Mastery:** The student **can** add and subtract within 1000 using multiple strategies **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.8

Using place value, add or subtract 10 or 100 from a given number.

General Notes:

This standard places emphasis on using place value reasoning to mentally add or subtract 10 or 100 from a given number. Students should recognize how adding or subtracting a multiple of ten or hundred affects the value of specific digits within the base-ten system instead of relying on counting or traditional computation algorithms.

Students should understand that: adding or subtracting 10 changes the tens digit while the ones digit remains the same (unless regrouping is required); adding or subtracting 100 changes the hundreds digit while the tens and ones digits remain the same (unless regrouping is required); and the value of each digit depends on its place within the number.

Instruction should encourage students to reason about changes in place value using mental mathematics before verifying their thinking with models. Models could include, but are not limited to place value charts, base-ten blocks, open number lines, and hundreds charts. Students should explain how they know which digits change and why.

Students' ability to develop this understanding strengthens their number sense, supports mental computation and estimation, and provides a bedrock for concepts such as multi-digit operations, rounding, and reasoning about place value in later grades.

Instructional Examples:

- The teacher might facilitate a *Would You Rather?* routine by presenting two mental strategies for finding 356 + 100 or 482 − 10. Students decide which strategy they would rather use, justify their choice, and discuss how place value can support efficient mental computation.
- Students might play a *Place Value Race* game in pairs. Students begin with a three-digit number, draw cards labeled +10, −10, +100, or −100 and mentally determine the new number before verifying their thinking with a place value chart or base-ten blocks.
- Students might investigate changes in elevation along a Montana roadway or mountain range where elevation markers increase or decrease by 10 or 100 feet. Students may predict the new elevation after each change, explain which digits change, and justify their reasoning using place value.

IEFA Integration Example: Bead Trading

Context and Connection:

Trade played a significant role in forming the economic, cultural, and geographic landscape of Montana. Trade routes of the 1700s and 1800s connected Indigenous communities, European traders, and settlements across the state and continent. These routes usually followed major river systems and trails to link the Great Lakes, Canadian Prairies, and Northern Rockies (The Canadian Encyclopedia, 2023). Trade items included items like animal pelts, tools, textiles, beads, food, horses, and cultural knowledge.

The histories and cultures of every Tribe in Montana were affected by this exchange in profound and unique ways, and the effects can be explored through the written and oral histories of each Tribal Nation. Over time, trade relationships and outside policies affected Tribal lands, economies, and relations, in ways that continue to shape communities today. This task highlights trade beads and beadwork traditions connected it Indigenous communities across Montana and the Northern Plains. This task does not identify one specific tribe but could easily be revised to be more specific to Tribes across Montana that engaged heavily in trade, depending on local contexts, resources, and partnerships with Indigenous Knowledge Keepers, Elders, or historians.

Pre-colonization, Indigenous Peoples of North America used natural materials such as shells, stone, bone, and porcupine quills to form artistic designs. However, with the introduction of European trade networks around the 1600s, many Indigenous artists incorporated glass beads into their traditions. Historical bead sample cards, provided by the Montana Historical Society, provide examples of the types of materials that circulated through these trade networks in the 1800s. These resources can help students explore how goods were exchanged, and why accurate counting and record keeping are important skills in commerce contexts.

This task pairs with the task listed under MT.2.NBT.5. This is by design. It is the author's hope that teachers will use both tasks to help with the development of student skills, while lowering the cognitive demand through familiarity with the context and structure of the activity.

Task Description:

To introduce the task, the teacher should provide some age-appropriate background on the history of trade in Montana and the important role that trade networks played in connecting Indigenous communities across the Northern Plains and surrounding regions. Where reasonable and appropriate, the teacher might invite Knowledge Keepers or Elders to share oral histories about trade, or might utilize resources from Tribes, a local cultural center, museum, or the Montana Historical Society. Students should understand that trade shaped communities across the Northern Plains and that each Tribe has its own history, traditions and experiences related to trade and beadwork.

The teacher should then introduce the activity by explaining that students will model trade scenarios that involve the exchange of beads along traditional trade routes of the 1800's. Students will use beads, counters, or other physical objects to represent items being traded. As they work, students will solve problems using place value to add or subtract 10 or 100 and will present their thinking in multiple ways.

Each scenario should begin with the same context: A person is traveling along a trade route with beads to exchange. As they move between trading posts and settlements, they trade away some beads and gather others. Keeping an accurate record of their inventory is important for successful trading. Students will rotate through stations. (Note that this context could easily be revised to be more specific to a single culture or geographic location depending on local resources and partnerships with Knowledge Keepers, Elders, or historians.)

Each station should contain:

- An image or physical example of a bead type;
- A short description that includes relevant facts about the bead type (e.g., types of items that might feature the bead, cultures that used the bead type, information about the origin of the bead, details about artists that work with the bead type today, etc.);
- Manipulatives or drawing tools for modeling; and
- A four-quadrant recording sheet like the one pictured below.

At each station, students will complete all four parts of the recording sheet:

Quadrant 1: Picture Representation Draw a model of the beads showing what is happening in the problem	**Quadrant 2: Equation** Write an equation that matches the scenario (e.g., 150 + 100 = 250)
Quadrant 3: Base Ten Representation Draw or model the number using hundreds, tens, and ones (e.g., base ten blocks, grouped beads, stacking cubes, etc.)	**Quadrant 4: Explanation or Strategy** Describe how the number changed and how place value helped solve the problem. (e.g., "I added 1 hundred, so the hundreds digit increased by 1.") It may be helpful to provide sentence stems for students here (e.g., "I (added/subtracted) ____ (hundreds/tens), so that the (hundreds/tens) digit (increased/decreased) by _____" or "I added ____ (hundreds/tens) so that the (hundreds/tens) digit increased by _____").

Station 1 – Seed Beads
"At this trading stop, the person has 230 blue seed beads to trade. They trade for 100 more seed beads. How many beads do they have now?"

Station 2 – Dentalium Shells
"The person has 180 dentalium shells. They traded away 10 shells. How many remain?"

Station 3 – Pony Beads
"At the next trading stop, the person has 340 pony beads. They receive 10 more beads during a trade. How many beads do they have now?"

Station 4 – Glass Trade Beads
"The person begins with 420 trade beads. They trade away 100 beads. How many beads remain?"

The teacher may choose to connect stations to specific locations, trade routes, or communities in present-day Montana. If doing so, teachers should clarify that these examples represent only a small portion of the many communities and trade networks that existed across the Great Plains and North America.

While moving through the station, students should discuss their thinking with partners or small groups. Students should be encouraged to compare how the values change when adding or subtracting 10 versus 100 to identify patterns about place value and the structure of numbers.

After rotations are complete, students can engage in a teacher-led discussion involving prompts such as:

- "What patterns did you notice when adding or subtracting 10? 100?"
- "How did place value help you solve the problems today?"
- "Which representation helped you best understand the changes?"
- "Why might accurate counting and records keeping be important in trade?"
- "Now that we learned a little bit about beads and trade, what would you like to learn more about?"

Extension activities might include having students create their own bead-trading scenario that involves adding or subtracting ten or one hundred. Students could write a story problem, solve it, and exchange problems with a classmate to compare strategies or solutions.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 5, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– Without context specific to a specific Tribe or Tribes, or without discussing the significance of trading or beading, this task would achieve the "contributions" level. With context relating to tribally or communally specific data, practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- Object Record: Trade Bead Sample Card – Montana Historical Society
- Object Record: Trade Bead Sample Card (2) – Montana Historical Society
- Object Record: Trade Bead Sample Card (3) – Montana Historical Society
- Bead and Quillwork Articles – Crazy Crow Trading Post

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** use place value to add or subtract 10 or 100 from a given number without **intensive support**.
2. **Developing:** The student **can** use place value to add or subtract 10 or 100 from a given number with **some support**.
3. **Proficient:** The student **can** use place value to add or subtract 10 or 100 from a given number **with independence and accuracy**.
4. **Mastery:** The student **can** use place value to add or subtract 10 or 100 from a given number **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.NBT.9

Understand and make connections between different strategies for addition and subtraction.

General Notes:

This standard helps students to transition beyond using multiple strategies to instead, developing an understanding of how and why different strategies work and how they are connected. Students should be able to recognize that different addition and subtraction strategies are connected through the structure of the base-ten system, properties of operations, and relationships among numbers. Instead of viewing strategies as isolated procedures, students should develop the ability to compare approaches, identify similarities and differences in these approaches, and explain why different methods for solving produce the same result.

Instruction should provide students with opportunities to analyze a variety of strategies, including but not limited to decomposing numbers by place value, making friendly numbers, compensation, using the relationship between addition and subtraction, applying known facts, and representing thinking with place value drawings, open number lines, equations, or concrete models. Students should also have opportunities to engage in classroom discourse around the advantages of different approaches and recognize that some strategies may be more useful or efficient depending on the numbers or context.

Teachers should encourage students to provide justifications for their reasoning, make connections among strategies, and explain how one strategy can be transformed into another. These discussions help students develop a deeper understanding of place value, operations, and mathematical structure and support strategic competence and mathematical communication. Developing these connections among computation strategies strengthens the student's number sense, promotes their ability to engage in flexible problem solving, and establishes a conceptual foundation for efficient algorithm use and engagement in more advanced algebraic reasoning covered in later grades.

Instructional Examples:

- The teacher might facilitate a *Compare and Connect* routine by presenting two different solution strategies for the same addition or subtraction problem. Students can identify what is similar and different about the strategies, explain why both methods work, and discuss when one approach might be more useful than the other.
- Students might participate in an *Error Analysis* activity by examining several student solution strategies that include both correct and incorrect reasoning. Students should identify misconceptions, revise inaccurate solutions, and explain how place value and properties of operations support correct reasoning.

- Students might complete a *Strategy Match* activity by pairing solved equations with the strategy used (e.g., compensation, making friendly numbers, decomposing by place value, or using related facts). Students can justify their matches and discuss how the different strategies are connected or related.

IEFA Integration Example: Quillwork

Context and Connection:

Quillwork is an intricate form of artwork that has been practiced by many Indigenous Peoples across the Northern Plains and other regions across North America where porcupines naturally live or where trade networks carried quills or finished materials featuring artwork. In some communities, like the Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne), quillwork artists can be highly respected and hold important cultural roles. Additionally, according to one artist, Deborah Magee, in the Niitsitapi/Amskapi Pikuni (Blackfeet) tradition, Tribal Elders must grant permission to practice the art (Viano, 2018).

Quillwork appears in historical and contemporary cultures across Montana. Some Tribes that have incorporated quillwork into artistic traditions, regalia, clothing, tools, horse gear, and other belongings include the Lakota, Dakota (Sioux), Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne), Niitsitapi/Amskapi Pikuni (Blackfeet), and Nakoda/Nakona (Assiniboine), Annishinabe/Métis (Little Shell Chippewa), among others. While some patterns and techniques can be shared within communities, artistic expression is often unique to the individual artist. The stories, meanings, and methods connected to quillwork vary by Tribe and are frequently passed down through family or community connections.

This task also explores the context of repairing and caring for regalia or important historical, cultural, or familial belongings. Some pass clothing, regalia, or handmade items from one generation to another. Alternatively, museums, cultural centers, and Tribal historic preservation programs may also work to preserve and protect these items for future generations to enjoy and so they may be returned to the loaning families or communities in the state in which they were received. Due to the delicate nature of quills, these belongings often require ongoing care and repair so that the stories, artistry, and cultural knowledge, and family or community connections associated with them can continue to be honored, cherished, and remembered.

Task Description:

To prepare students for learning, the teacher should provide some background to students about quillwork traditions and the importance of preserving and caring for cultural or historical belongings. Where reasonable and appropriate, the teacher might welcome a Knowledge Keeper, artist, museum educator, or community member to share experiences, stories, or examples of quillwork, discuss the process of preparing quills, or explain how artifacts are cared for and repaired.

The teacher may also choose to show the Cheyenne story "Quillwork Girl and Her Seven Brothers," the video from the Royal Alberta Museum – Indigenous Artistry: Quillwork or Chickasaw TV – Porcupine Quillwork, show images of quillwork from Montana Tribes, or provide students with opportunities to observe patterns, colors, and materials used in quillwork contexts. Students should also be aware that the stories, techniques, and

meanings connected to quillwork can vary across Tribes, families, and artists. The teacher may also share with students that, on average, porcupines have over 30,000 quills.

To transition to the math task, the teacher should explain that, due to the delicate nature of quills, artists or preservation experts who repair or create quillwork often need to organize, sort, count, and prepare materials with care. Based on what is most appropriate for local context, students will imagine they are helping prepare quills to repair an important piece of regalia or other culturally significant item that has been passed down through generations or preserved in a museum or cultural center collection. The teacher should provide students with manipulatives such as colored straws, sticks, pipe cleaners, paper strips, counters, or other objects to represent quills. Students can work on the task individually, in pairs, or in small groups – whichever is more appropriate for the local context.

Students will solve addition and subtraction problems connected to preparing and organizing quills. The focus of the task should be to find the correct answer but also understand and compare strategies for problem-solving. Students should represent and explain their thinking using appropriate representations such as drawings, manipulatives, equations, number lines, base-ten representations, or verbal explanations.

Some example scenarios could include:

- "A person gathered 48 porcupine quills. They gathered 26 more the next day. How many quills do they have altogether?"
- "An artist prepared 72 quills for flattening. So far, 35 have been flattened. How many still need to be prepared?"
- "A section of regalia needs 54 yellow quills for repair. The artist already prepared 27. How many more are needed?"
- "One group sorted 36 blue quills and 24 red quills. How many quills were sorted altogether?"

Students should solve the task using more than one strategy for each problem. The teacher should encourage students to compare methods and discuss connections between strategies. Teachers may wish to support students by modeling or highlighting strategies on anchor charts such as making tens, decomposing numbers, using doubles/near doubles, counting on, using place value, using representations, etc.

The teacher should also encourage students to reflect on their process by asking questions like: "How did your strategy work?", "Did anyone solve it a different way?", "What was similar/different about the strategies?", "Which strategy helped you understand the problem most clearly?", "How did the manipulatives or drawings help you think about the problem?", etc.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 5, EU 6, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– Without context specific to a specific Tribe or Tribes, or without discussing the significance of quillwork or cultural preservation, this task would achieve the "contributions" level. With context relating to tribally or communally specific data, practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- Women's Arts – Smithsonian National Museum of the American Indian
- Star Stories: Quillwork Girl and Her Seven Brothers – Smithsonian National Museum of the American Indian
- Indigenous Artistry: Quillwork – Royal Alberta Museum
- Blackfeet Artist to Demonstrate Ancient Quilling Technique – Flathead Beacon
- Oral Traditions and History Comparing Cheyenne and Crow Star Stories (Grade 2 Lesson Plan) – Montana Office of Public Instruction
- Porcupine Quillwork – Chickasaw T.V.
- Q is for Quillwork – The Virtual Museum of Metis History and Culture

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** understand or make connections between different strategies for addition and subtraction without **intensive support**.
2. **Developing:** The student **can** understand and make connections between different strategies for addition and subtraction with **some support**.
3. **Proficient:** The student **can** understand and make connections between different strategies for addition and subtraction **with independence and accuracy**.
4. **Mastery:** The student **can** understand and make connections between different strategies for addition and subtraction **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.1

Measure the length of an object by selecting and using appropriate tools.

General Notes:

This standard supports extension of students' understanding of measurement by asking them to select and use an appropriate tool to measure the length of an object. Students should recognize that different tools are designed for different measurement situations and that choosing an appropriate tool is an important step in the measurement process. Students should gain experience measuring a variety of objects using tools such as rulers,

yardsticks, meter sticks, and measuring tapes. This list is not exhaustive, and teachers should provide opportunities for students to explore additional measurement tools appropriate for the context provided.

Instruction should emphasize that accurate measurement depends not only on selecting an appropriate tool but also on using it correctly. Students may engage skills such as aligning the zero mark with the beginning of the object, attending to the measurement units, and recording measurements with the appropriate unit. They should also recognize that some tools are better suited for measuring short, long, straight, or flexible objects. Students should also have opportunities to compare the effectiveness of different tools and explain why a measuring tool is appropriate for a given task.

Students' ability to develop proficiency in selecting and using measurement tools supports their ability to conduct accurate measurements, estimations, problem solving, and later work involving perimeter, area, data collection, and contextual applications of measurement.

Instructional Examples:

- The teacher might facilitate a *Notice and Wonder* routine by displaying several measuring tools (e.g., a ruler, measuring tape, yardstick, and meter stick) alongside a collection of classroom objects. Students discuss what they notice about the tools, when each might be useful, and justify which tool they would select for measuring each object before testing their predictions.
- Students might participate in a *Measurement Tool Sort* by examining a variety of classroom and household objects and deciding which measuring tool would be most appropriate for each. Students can justify their choices before measuring and reflect on whether another tool may have been equally effective.
- Students might investigate how a veterinary technician measures the length of different animals or equipment. Students select appropriate measuring tools to measure items such as a leash, animal carrier, examination table, or animal, and justify why one tool is more appropriate than another.

IEFA Integration Example: Horses

Context and Connection:

Horses have played an important role in the histories and cultures of many Plains Tribal Nations. After their introduction to the Northern Plains, horses dramatically transformed many aspects of Indigenous and Settler life from transportation, hunting, trade, warfare, and travel. Today, many Indigenous people continue to maintain meaningful relationships with horses through ranching, rodeo, Indian relay, cultural celebrations, traditional practices, and the preservation of wild horse herds in Montana, such as those found in the Pryor Mountains or Wild Horse Island. While the significance and use of horses is varied across Tribal Nations and individuals, horses continue to hold cultural, historical, and personal connection for many Indigenous communities.

The items used in horsemanship in both historical and contemporary times provide many authentic opportunities to apply measurement. Saddle bags, bridles, stirrups, lead ropes, blankets, reins, and other equipment vary in size and purpose, thereby requiring makers and users to carefully consider length and fit. This task uses a Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne) saddle bag from the Smithsonian Institution as the context for

exploring measurement. However, teachers are encouraged to adapt the task using locally relevant examples of horse equipment, artwork, or cultural materials whenever possible.

Task Description:

To introduce the task, the teacher may read *Philene and Buttons* from the Indian Reading Series, share *Tasunka: A Lakota Horse Legend* by Donald F. Montileaux, or show a short video such as *The People of the Horse* (National Geographic) or *Indian Nations:* Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne) *(*Indigenous Americans). It is not the purpose of the introduction to teach every aspect of horse culture, instead, it should be designed to help students understand that horses still play meaningful roles in many Indigenous communities, and to provide an entry point for student relation to the context.

Then, the teacher should display the image of the Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne) saddle bag (or a locally relevant artifact) and facilitate a Notice and Wonder routine.

Students may first reflect independently before discussing with a partner. The teacher should ask: "What do you notice?" and "What do you wonder?" Students should generate observations and questions about the object. The teacher should record student thinking and invite volunteers to share particularly interesting questions with the class. It may be possible for the teacher to answer some questions immediately, while others may remain open for future investigation.

After students have discussed the artifact, the teacher might say: "We have been learning about measurement. I wonder if mathematics could help us learn even more about this object." Then: "What parts of this saddle bag could we measure?" Students will then work with partners to generate as many measurable attributes as possible before sharing with the class. Possible responses might include length of the fringe, width of the bag, length of the beaded rows, length of the leather straps, size of the opening, distance between bead rows, etc. The teacher should record all ideas and students should hypothesize privately about which measuring tools might work best for each feature.

Whenever possible, students should work with authentic materials. Teachers may work with Tribal Departments, Elders, or Knowledge Keepers, or request traveling trunks from sources like the Montana Historical Society, community museums, or local cultural centers that may contain relevant materials. When authentic objects are unavailable, teachers may provide carefully prepared replicas or simplified models using leather, fabric, ribbon, fringe, beads, or paper.

Students should also have access to a variety of measuring tools, including rulers, tape measures, yardsticks, meter sticks, and flexible sewing tapes. Students will work in pairs to select an appropriate tool for each measurement they wish to make. Rather than assigning a single tool, students should justify why they selected a particular measuring tool before beginning. Students use a record sheet to note what they measured, the tool they selected, the measurement, and why they believed that tool was the best choice.

After working in partnerships, each pair should then join another pair to form groups of four. Each partnership will explain what they chose to measure, the measuring tool they selected, why they chose it, and any challenges they encountered. Students compare their measurements and discuss why small differences may have occurred within each group.

Following the small group discussion, the teacher should facilitate a whole-class discussion, asking questions such as: “Which tool worked best for measuring the fringe? Why?”, “Were some tools easier to use on curved or flexible parts of the object?”, “Did everyone get exactly the same measurement? Why or why not?”, “What makes a measuring tool a good choice for a particular object?”, “If you were making this saddle bag yourself, why would careful measurement be important?” "When is it appropriate to use a big tool and when is it appropriate to use a small tool?”, or “Did everyone use the same tool to measure? If not, how did that process go?”

Note that, while group work adds increased engagement and mathematical discourse to this activity, it is not exactly necessary. Schools with limited class sizes could easily modify this task to better align with the local classroom conditions.

To close the lesson, students may reflect on the learning activity using prompts such as: “How did measurement help us learn more about this object?”, “Why do you think makers need to measure carefully when creating items like saddle bags?”, “What did you learn today about horses or horsemanship in Indigenous cultures?”, “What questions do you still have about the saddle bag or the people who made it?”, etc.

This activity could be extended by measuring additional horse-related equipment such as lead ropes, blankets, reigns, or bridles. Students could also compare the lengths of similar objects and discuss why they might differ or design a simple saddle bag using specified measurements. The teacher might also allow students to visit a museum, cultural center, or ranch to observe additional examples of horse equipment and measurement in action or invite a local Tribal member, Elder, Knowledge Keeper, horse owner, rancher, leather worker, farrier, veterinarian, or other community member to discuss how measurement is important in caring for horses or creating equine equipment.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 5.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– Without context specific to a specific Tribe or Tribes, or without discussing the significance of horses to Tribes or Indigenous Individuals, horsemanship, or horse culture, this task would achieve the “contributions” level. With context relating to tribally or communally specific data, practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the “additive” level.

Relevant Resources:

- Indian Nations: Northern Cheyenne – Indigenous Americans
- The People of the Horse – The National Geographic
- Saddle Blankets and Saddles – The Smithsonian
- Hands on History Footlockers – Montana Historical Society

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** measure the length of an object by selecting and using appropriate tools without **intensive support**.
2. **Developing:** The student **can** measure the length of an object by selecting and using appropriate tools with **some support**.
3. **Proficient:** The student **can** measure the length of an object by selecting and using appropriate tools **with independence and accuracy**.
4. **Mastery:** The student **can** measure the length of an object by selecting and using appropriate tools **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.2

Understand the relationship between unit sizes and number of units by measuring a single object using two different units of common measurement.

General Notes:

This standard supports the development of students' understanding of the relationship between the size of a measurement unit and the number of units needed to measure an object. Students should be able to measure the same object using two different units of common measurement and explain why the numerical measurement changes depending on the size of the unit.

Students should recognize that: larger measurement units result in fewer units needed to measure the same object; smaller measurement units result in more units needed to measure the same object; and although the numerical measurement changes, the length of the object remains the same.

Instruction should emphasize reasoning about the relationship between unit size and measurement instead of memorization of conversion rules. Students should measure the same object using two different units, compare the results, and explain why different units produce different numerical values. Opportunities to discuss, justify, and generalize their observations help students build a conceptual understanding of measurement.

Students should measure a variety of objects using contextually appropriate common measurement units such as inches, feet, centimeters, and meters. This practice prepares students for unit conversions and proportional reasoning in later grades.

Instructional Examples:

- The teacher might facilitate a *Predict-Measure-Explain* routine that asks students to estimate whether an object will measure more units in inches or centimeters before measuring. After collecting data, students should explain why the numerical measurements differ even though the object's length remains the same.
- Students might participate in a *Measurement Investigation* by measuring a classmate's height in both feet and inches. After comparing the two measurements, they explain why the numerical values differ even though the height is fixed. Students may then apply this understanding to determine which of several recorded heights represents the tallest student when the measurements are given in different units.
- Students might investigate how a quilt maker measures fabric for a quilt. Students should measure the same piece of fabric using two different units of common measurement (such as yards and inches), compare the results, and explain why the numerical measurements differ even though the length of the fabric does not change.

IEFA Integration Example: Métis Sash

Context and Connection:

The Métis sash has been an important part of Métis culture and identity for many generations. Historically, sashes were handwoven using colorful European wool fibers that served many practical purposes. Depending on the needs of the wearer, some of these uses could include holding clothing in place, providing protection from the elements, as a saddle blanket or carrying strap, as a multipurpose tool, as an emergency bandage, or as a signaling device (Préfontaine & Shimon, 2003). The colors and patterns often represented family, regional, or community traditions and creating a sash required a high level of craftmanship, precision, and attention to detail.

Today, the Métis sash continues to be worn by Métis people during celebrations, ceremonies, dances, and other cultural events as an expression of identity, heritage, and community. Members of the Little Shell Tribe of Chippewa Indians of Montana and other Métis living in communities on and off reservations or reserves continue to preserve this tradition while also creating contemporary designs that reflect their individual artistic expression and cultural pride.

To create a sash, the artist must carefully measure yard and woven sections to ensure that the finished product is the correct length of its intended purpose and wearer. In this task, students will measure a model of a Métis sash using different units of measurement to explore how the size of the measuring unit affects the number of units needed to describe the same object.

While this task engages the Métis sash as the context, it could be modified to integrate other forms of regalia, traditional, or modern dress used in other Indigenous cultures as locally and culturally appropriate. There are many opportunities, across Tribally specific contexts, for students to explore how to use different units of measurement and how size affects the number of units needed to describe the same object. When modifying this task,

educators are strongly encouraged to partner with local Tribal representatives, Elders, Knowledge Keepers, and cultural centers to ensure instruction reflects local histories, cultures, and traditions accurately and respectfully.

Task Description:

To introduce the lesson, the teacher might ask students to think about clothing or accessories that are important to them or their families. Questions such as "Do you own something that has special meaning?" or "Do you wear something that helps you do a particular job or activity?" may help students connect to the context. Students may share examples such as work gloves, dance costumes, belts, sports uniforms, or family heirlooms.

The teacher should explain that many cultures around Montana, the United States, and the world have clothing and accessories that carry both practical and cultural significance. They may invite students to share examples from their own families or communities before introducing the Métis sash as an important symbol of Métis identity and craftsmanship.

Using photographs of historical and contemporary Métis sashes, or, if possible, an authentic sash shared by a cultural expert, Elder, Knowledge Keeper, or community member, the teacher should facilitate a brief discussion about what students notice. Students should understand that sash colors and patterns often reflect family, community, or personal traditions and that these articles have historically served many practical purposes in addition to being expressions of identity.

To deepen understanding, the teacher may share excerpts from S is for Sash or other resources provided describing the symbolism and uses of the sash or invite students to participate in a reading routine such as Weighty Words, See-Think-Wonder, or Turn and Talk to discuss what they learned. The teacher should then transition to the mathematics by asking: “If you were weaving a sash for someone, how would you know how long to make it?” and "If you didn't have a ruler, tape measurer, or yardstick, what could you use instead? What would be the advantages and disadvantages?" Then, the teacher should allow students time to discuss possible ideas before introducing the investigation.

The teacher should explain: "Fiber artists carefully measure the yarn they use so the finished sash is the right size for the person who will wear it. Today, we'll investigate how the measuring unit we choose changes the number of units needed to describe the same sash." Then, the teacher will show the sash (or model) they are trying to measure and the tools available to students. They will ask the students to first form an independent hypothesis – “Which measuring tool do you think will require the greatest number of units when we use it to measure this sash? Why?”

The teacher should have students form pairs and go to a vertical workspace or station.

At each work area, students should have access to:

- a real or model Métis sash (or ribbon, woven strip, yarn, fabric, etc.) cut to the same length at each station,
- one standard measuring tool (ruler, tape measure, yardstick, etc.), with units specific to that station, and
- a recording sheet.

Pairs should first share their hypothesis and discuss – "Which measuring tool do you think will require the greatest number of units when we use it to measure this sash? Why?"

All students then measure the same length using the measuring tools specific to their stations, carefully recording: the measurement, the unit used, and any observations. Their measurements should be recorded on their recording sheet that they take with them and at the station (though their answer should be covered until the next group has had a chance to work).

After completing their measurements, pairs rotate to another station where a different measuring tool is available. They should repeat the process of measuring the sash or model with the new unit tool. Once they have completed this step and recorded their findings on their own sheets, they should compare the previous group's work, compare their findings at the station to their findings from the previous station, discuss similarities and differences, and revise their work if needed. As students rotate, they begin noticing that larger measuring units produce smaller counts, while smaller measuring units produce larger counts, even though the sash itself has not changed.

Once the investigation is over, the class should be brought together to compare results. Questions may include: "Why did different stations get different numbers for the same sash?", "Did the sash change, or did the measuring unit change?", "Which measuring tool required the greatest number of units? Why?", "Which measuring tool would be most helpful if you wanted another artist to weave the same sash? Why?", "Why might a fiber artist choose one measuring tool over another?", etc. The teacher should encourage students to use their observations and measurements to justify their reasoning and guide students to the culminating mathematical observation that the size of the measuring unit changes the number of units needed to measure the same object. Larger units require fewer counts, while smaller units require more counts.

Possible extension activities include measuring additional woven or textile objects (ribbons, belts, woven straps, blankets, or ribbon skirt materials) and using multiple units to compare results or visiting a museum, cultural center, or inviting a Métis artist, Elder, or Knowledge Keeper to demonstrate weaving or discuss the role of measurement in fiber arts.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 6.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, this task would achieve the "contributions" level. With context relating to tribally specific practices, traditions, language, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to reflections about the importance of clothing or Métis sashes as examples of living culture activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Who Are the Little Shell? – Montana Office of Public Instruction (Designed for 6th-8th grade, but serves as an excellent resource bank)
- Who Are the Metis? - Montana Historical Society (Designed for 3rd – 6th grade, but serves as an excellent resource bank)
- S is for Sash student reading and coloring page – The Virtual Museum of Métis History and Culture
- History of the Métis Sash – The Virtual Museum of Métis History and Culture
- Montana & Metis History – Mike and Maureen Mansfield Library

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** understand the relationship between unit sizes and number of units by measuring a single object using two different units of common measurement without **intensive support**.
2. **Developing:** The student **can** understand the relationship between unit sizes and number of units by measuring a single object using two different units of common measurement with **some support**.
3. **Proficient:** The student **can** understand the relationship between unit sizes and number of units by measuring a single object using two different units of common measurement **with independence and accuracy**.
4. **Mastery:** The student **can** understand the relationship between unit sizes and number of units by measuring a single object using two different units of common measurement **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.3

Estimate lengths using units of common measurement.

General Notes:

This standard supports the development of students' ability to make reasonable estimates of an object's length using units of common measurement. Units of common measurement include, but are not limited to, units such as inches, feet, centimeters, and meters. Estimation is a mathematically valid strategy that helps students develop measurement sense and gain the ability to reason about the approximate size of objects before determining an exact measurement.

Students may use a variety of strategies to estimate lengths using common measurement units. For instance, they may estimate by visually comparing an object to a measuring tool, such as a ruler or meter stick, or by using familiar mental benchmarks for standard units of measure (e.g., a piece of paper is approximately 12 inches long, the width of a pinkie finger is approximately 1 cm, etc.). As students gain more experience, they start

developing increasingly accurate intuitions about the relative sizes of units such as inches, feet, centimeters, and meters. Instruction should provide students with opportunities to explain the reasoning behind their estimates, compare different estimation strategies, and recognize that reasonable estimates may vary while remaining mathematically justifiable.

Developing proficiency in estimating lengths supports students' ability to gain skills related to measurement sense and problem solving, and supports later work with precise measurement, fractional units of measure, and contextual applications.

Instructional Examples:

- The teacher might elect to facilitate a *Would You Rather?* routine that presents students with an object and asks them to determine whether it is closer to one measurement or another. For example, 6 inches or 6 feet, or 20 centimeters or 2 meters, etc. Students justify their estimates using their understanding of the relative size of common measurement units.
- Students might participate in an *Estimate and Defend* activity by sorting classroom objects or images of objects under the most reasonable estimated length (e.g., about 1 inch, about 1 foot, or about 1 yard, or about 1 centimeter, about 1 meter). Students may then defend their choices to a partner, small group, or the class using mathematical reasoning.
- Students might investigate how anglers estimate whether a fish is long enough to meet a minimum length requirement before measuring it. Students estimate the lengths of model fish or fish images using units of common measurement and justify why their estimates are reasonable.

IEFA Integration Example: Fancy Shawl

Context and Connection:

Across many Tribal Nations, regalia work during dances, ceremonies, and celebrations often reflect individual and cultural identity as well as familial and communal belonging. Each piece is created with intention and colors, materials, patterns, designs, and articles often carry personal, familial, or cultural significance. Sometimes, regalia items can be passed down by previous generations or gifted by loved ones, carrying additional meaning. Regalia is not considered a costume. It is an important expression of culture, tradition, and belonging.

The Women's Fancy Shawl Dance is a powwow dance practiced among many Indigenous communities across the Northern Plains and beyond. This includes but is not limited to members of the Apsáalooke (Crow), Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne), Niitsitapi/Amskapi Pikuni (Blackfeet), Nakoda/Nakona (Assiniboine), Gros Ventre (A'aninin), Ne-i-yah-wahk (Plains Cree), Annishinabe (Chippewa/Ojibwe), and Annishinabe/Métis (Little Shell Chippewa) communities. Dancers typically wear a decorative dress, beaded moccasins and leggings, jewelry, feathers, and a shawl adorned with flowing fringe, although regalia varies among individuals and communities.

Today, dancers may perform either an Old Style or a Modern Contemporary style. Old Style dancers emphasize graceful movement, intricate footwork, and controlled shawl movements that are often said to resemble the flight of a butterfly (OPI, 2026). While less popular in recent decades, Old Style is experiencing a resurgence in popularity among dancers (McNabb, 2026; Personal Communication). Modern Contemporary dancers incorporate faster

footwork, spinning, and high-energy movements and are widely performed at powwows throughout Montana and across North America by dancers from many Tribal Nations (OPI, 2026).

Creating a Fancy Shawl requires thoughtful planning and skilled craftsmanship. Before cutting fabric or fringe, artists often estimate the amount of material they will need, to help with purchasing, to ensure the finished shawl is the appropriate size for the dancer, and to minimize wasted materials. Although this task uses the Women's Fancy Shawl Dance as its context, the mathematical ideas can be explored through many forms of Indigenous regalia, clothing, and textile arts where locally and culturally appropriate. Teachers are encouraged to partner with Tribal representatives, Elders, Knowledge Keepers, dancers, artists, or cultural centers to ensure instruction reflects local histories, traditions, and perspectives accurately and respectfully.

Task Description:

If possible, invite a local Fancy Shawl dancer, Elder, Knowledge Keeper, or regalia maker to share their experiences with students. They may choose to discuss the significance of Fancy Shawl Dance, stories associated with its origin or their experiences, the purpose of regalia, or the artistry involved in creating a shawl. If a community member is unavailable, teachers may instead use one or more of the resources provided below, such as Pow Wow Times – Ladies Fancy Dance: Meaning and Origins or Calgary Stampede – Powwow 101 – Women's Fancy.

During this introduction, the teacher should make sure students understand that regalia is not a costume and that it is an important expression of identity, culture, family, and community. They may explain that there are many styles of powwow dance and that each dancer's regalia reflects individual preferences, artistic choices, Tribal traditions, and personal experiences and belonging.

The teacher will then transition to mathematics by introducing the following scenario: *A regalia artist is creating a contemporary Fancy Shawl. They have several pieces of ribbon remaining from previous projects and wants to know whether they are long enough to become fringe on the shawl. Before cutting new ribbon, the artist estimates whether the pieces they already have will work.*

Display a sample piece of ribbon that represents the approximate finished length of one piece of fringe (or an unfolded piece if preferred). Teachers should not provide its measurement immediately and instead invite students to study the ribbon and consider how they might estimate its length.

Teacher Note: *In a contemporary shawl, unfinished fringe is usually 28-36" long and each piece is folded in half and tied to the shawl to create an end measurement of 14 – 18".*

Once students have concluded their initial investigation, the teacher should begin the math task by helping students develop personal benchmarks for estimation. The teacher may ask: "If you didn't have a ruler, how could your own body help you estimate length?" Students should brainstorm body-based measurement references such as the length of a finger, the width of a hand, the distance from wrist to elbow, a foot, their arm span ("wingspan"), etc.

Discuss that, people including artists and craftspeople have often relied on familiar reference points before using formal measuring tools to estimate lengths or distances and that this practice is not just historical, but ongoing in many settings and contexts. Allow students to estimate the ribbon using one or more of their personal benchmarks. Encourage them to explain why they selected that benchmark.

Teacher Note: *Young children sometimes believe an estimate should be exact. Explain that good estimators do not try to guess the exact answer. Instead, they make a reasonable estimate based on what they know. Celebrate estimates that are thoughtful and justified rather than simply the closest. Dr. Jo Boaler refers to this as "Ish-ing" in her book, Math-Ish.*

Next, have students work collaboratively in pairs or small groups as they rotate through estimation stations. Each station should contain ribbon or yarn representing potential pieces of fringe of varying lengths.

For each ribbon, students should be required to:

1. Make an initial estimate using a personal benchmark.
2. Record and justify their estimate.
3. Measure the ribbon using a rule, tape measure, or other common measurement tool, estimating to the nearest unit.
4. Compare the estimate to the actual measurement.
5. Reflect:
    - What helped your estimate?
    - What would you do differently next time?

As students rotate, they should be encouraged to refine their estimation strategies instead of focusing on being "right."

Once the estimation station activity is completed, the teacher may bring the class together to compare strategies. The teacher should purposefully select groups to share that used different reasoning approaches. Prompts might include: "Which benchmark helped you most?", "Which estimates were closest? Why?", "Did anyone change their thinking while measuring?", "What makes an estimate *reasonable*?", "How did your benchmark help you make a better estimate?", etc.

All the while, the teacher should guide students toward the understanding that strong estimators rely on known reference lengths and improve their estimates through experience.

To conclude, the teacher might reconnect the mathematical thinking to the cultural context through reflection questions such as: "Why might a regalia artist estimate before measuring?", "How could estimating first help reduce wasted materials?", "Why is careful planning important when creating something that is both beautiful and meaningful?", "How did using your own benchmarks help you become a better estimator?", "Are their times where you or the adults in your life use personal benchmarks to estimate measurements?", etc.

The teacher should emphasize that estimation is a practical skill used by artists, builders, sewists, engineers, and many other professionals. Like the artists who create Fancy Shawl regalia, mathematicians use estimation to make informed decisions before measuring precisely.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 6.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, or the unique expressions and styles of powwow dance and regalia, this task would achieve the "contributions" level. With context relating to tribally specific practices, traditions, language, regalia, dance, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to reflections about the importance of regalia, dance, or powwow as examples of living culture activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Your Guide to Understanding Powwows – Montana Office of Public Instruction
- Powwow 101 – Women's Fancy – Calgary Stampede
- R is for Regalia – Plains Art Museum
- Learn About Fancy Shawl Dancing for Kids – Canadian Broadcasting Company (CBC)
- Ladies Fancy Dance – Meaning and Origins – Pow Wow Times

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** estimate lengths using units of common measurement without **intensive support**.
2. **Developing:** The student **can** estimate lengths using units of common measurement with **some support**.
3. **Proficient:** The student **can** estimate lengths using units of common measurement **with independence and accuracy**.
4. **Mastery:** The student **can** estimate lengths using units of common measurement **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.4

Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard-length unit.

General Notes:

This standard supports the development of students' ability to draw comparisons between two objects using standard unit measurements. Students should recognize that the difference in length represents how much longer or shorter one object is than another. Instruction might provide opportunities for students to measure objects using appropriate tools and express that difference in a common unit (e.g., inches, feet, centimeters, meters). Students may use a variety of strategies, such as direct comparison, subtraction, number lines, or visual models to determine and explain the difference between two measured lengths. There should be some emphasis placed on using consistent units correctly and understanding the relationship between the measurements, instead of viewing the difference as a simple subtraction calculation without meaning.

When students develop proficiency in comparing and determining differences in length, they gain strengthened measurement sense, understanding of additive relationships, and problem-solving skills. These also support students' ability to engage in more sophisticated measurement, geometry, and contextual applications in later grades.

Instructional Examples:

- Students might work with a partner to compare their heights by cutting pieces of yarn or string to represent each student's height. They may then use appropriate measuring tools, such as flexible measuring tapes or meter sticks, to measure the lengths in centimeters. Students should then determine how much longer one piece of student is than the other and express this difference using the same unit of measurement.
- Students might engage in an error analysis activity by examining a sample of student work comparing the lengths of two objects. The same should contain an error in the measuring process, recording of units, or calculation of the difference. Students can identify and explain the error, correct the work, and express the difference using appropriate units.
- The teacher might engage students in a problem and place-based task involving fish found in a local stream or lake. Students can investigate two fish of the same species, using life sized images, models, or paper cut outs. Students should measure each fish using a common unit of measurement, determine how much longer one fish is to another, and express the difference using appropriate units. Students might discuss how comparing fish lengths can be useful to anglers, biologists, or Fish and Game wardens.

IEFA Integration Example: Cree Language – Family

Context and Connection:

Language is an important part of culture, identity, and community. Indigenous Peoples across Montana have spoken many different languages since time immemorial. Each language reflects the unique histories, homelands, traditions, and dialects of a Tribal Nation or culture. Familial relationships can be expressed through specific kinship terms that can carry cultural meaning that may not always translate directly to English. Additionally, in many languages, these terms can vary depending on the person speaking, their relationship with a family member, and whether that relationship is through the maternal or paternal side of a family. Though many Indigenous languages have experienced diminishing numbers of native speakers due to federal policies and boarding school era practices, Tribal Nations in Montana and abroad continue to revitalize and preserve their heritage languages through schools, language programs, community courses, and stewardship by Elders and fluent speakers.

This task uses Ne-i-yah-wahk (Plains Cree) family terms as one example of how Indigenous languages can describe relationships between family members. The task can be modified for increased local relevance and community connection to other Montana Tribes or Tribal Languages. Teachers are encouraged to partner with local Elders, Knowledge Keepers, or language speakers whenever possible.

Task Description:

As an introduction to the task, the teacher may share a story about family by an Indigenous author such as *Fry Bread* by Kevin Noble Maillard, *Jingle Dancer* by Cynthia Leitich Smith, *Here Come the Aunties* by Cynthia Leitich Smith, or *Grandmother Moon* by Wunneanatsu Lamb-Cason.

The teacher might then bridge to the mathematical task by explaining: "Today we are going to learn a few Nēhiyawēwin or Nēhiyaw (Cree Language) words that describe members of a family. Just as English has words like *mother*, *father*, and *grandparent*, Nēhiyawēwin-speaking Ne-i-yah-wahk (Plains Cree) have their own words for family members. Indigenous languages are living languages that continue to be spoken today, and each Tribal Nation has its own language and words." To help students connect the lesson to their own experiences, the teacher might ask questions such as: "*Do you have special names you call people you care about?*" or "*Do you have a nickname for someone you love?"*

The teacher should then introduce a scenario in which child has recorded the heights of members of their family and needs help comparing them. Five stations should be prepared around the classroom. Each station should include the Nēhiyawēwin family term, the English translation, and a visual representation of the family member's height (e.g., a paper strip, ribbon, yarn, tape, paper chain, silhouette, etc.). The teacher may choose any appropriate heights; however, sample measurements are provided here:

Nēhiyawēwin Family Term	Moosum	Nookum	Nikawi	Notawi	Noosim
English Translation	Grandfather	Grandmother	Mother	Father	Grandchild
Height (in inches)	68	63	65	70	48

Note: Nēhiyawēwin Family Terms provided by Carrie McNab.

Students should rotate through each station and measure each representation using appropriate tools for measurement such as rulers, tape measures, or yard sticks. At each station, students should record the height on a recording sheet. As students visit each new station, they should be encouraged to compare measurements with questions such as “Who is taller?”, “Who is shorter”, and “How many inches shorter or taller?” The teacher may consider providing sentence stems and opportunities to physically compare the representations by aligning them at one end to make differences visible and to lessen the cognitive load on students.

Instructional consideration: Students may recognize that one height is greater than another without understanding how to determine how much greater. This can be resolved by encouraging students to align two representations at a common starting point and examine the additional length. The physical and numerical differences can also be connected through the use of drawings, measurement tools, or equations.

After students have completed all stations, the teacher should bring the class together to discuss their findings. They may ask questions such as: “Which family member is taller?”, “How many inches taller?”, “What is the difference between heights?”, “Which two family members are closest in height?”, “How did measuring carefully help you compare heights?”, “Did anyone solve the same comparison differently?”, etc.

Students should be prompted to justify their thinking using measurement drawings, tape diagrams, rulers, connecting cubes, or equations where appropriate.

After the completion of the discussion, the teacher may consider connecting the mathematical learning back to language and culture by offering a prompt such as: “*Today we learned a few Cree words that describe family members. Why do you think it is important to keep languages alive and continue teaching them to younger generations?”,* “*What is one Cree family word you hope you remember?*”, “*What did you learn about how mathematics can help us compare and describe people or things?”*, “*What other Cree words would you like to learn?”, etc.*

Possible extension activities can include representing the family members’ heights on a number line, measuring classmates and comparing differences in height, measuring family members or trusted adults at home and comparing their heights, learning additional Cree kinship terms, or comparing family words from other Montana Tribal or heritage languages.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 5.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, this task would achieve the “contributions” level. With context relating to tribally specific practices, traditions, language, or stories, a slightly deeper depth and engagement might be engaged that

would achieve the “additive” level. Connecting this task to reflections about the importance of language as living culture activates a level of depth and engagement for learners that rises to the “transformation” level.

Relevant Resources:

- Chippewa Cree Language App – Stone Child College
- Chippewa Cree Language Revitalization – Mahchiwminahnanahtik (MCCLR)
- Plains Cree Dictionary – Alberta Language Technology Lab – itwêwina
- Classroom Language Games and Learner Kits – Native Teaching Aids
- Montana Native American Language Apps – Montana Historical Society

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** measure to determine how much longer one object is than another or express the length difference in terms of a standard-length unit without **intensive support**.
2. **Developing:** The student **can** measure to determine how much longer one object is than another and express the length difference in terms of a standard-length unit with **some support**.
3. **Proficient:** The student **can** measure to determine how much longer one object is than another and express the length difference in terms of a standard-length unit **with independence and accuracy**.
4. **Mastery:** The student **can** measure to determine how much longer one object is than another and express the length difference in terms of a standard-length unit **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.5

Use addition and subtraction within 100 to solve problems in context involving lengths that are given in the same units. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

General Notes:

This standard serves as an extension of students’ understanding of measurement by applying previous skills to addition and subtraction within 100 in contextual applications. This application supports the development of procedural fluency, in particular, the ability to transfer mathematical strategies to new contexts and problems, the selection of appropriate strategies, and the adaptation of previously learned procedures in problem solving.

Students should recognize that length measurements can be combined, separated, or compared to solve problems and that these relationships can be represented mathematically. Instruction should provide students with opportunities to solve a variety of contextual applications using different strategies and representations. Examples might include, but are not limited to, drawings of rulers and equations with a symbol for the unknown number to represent the problem.

Students' ability to develop proficiency in this standard strengthens their sense of measurement, understanding of additive relationships, and problem-solving skills. These also support students' ability to engage in more sophisticated measurement, geometry, and contextual applications in later grades.

Instructional Examples:

- Students might solve contextual word problems. For instance, they may be asked to combine lengths or determine how much longer one object is than another.
- Students might participate in a jigsaw activity in which small groups are assigned to different contextual problems that involve addition and subtraction of lengths. Each group may solve its assigned problems, use representations to support it, and prepare to explain its reasoning. Then, students may reorganize into mixed groups to discuss their problems, explain their strategies, and discuss how addition and subtraction may be applied in other problems involving length. They may even design their own problem as a group, to share with other groups.
- Students might investigate a Montana wildlife tracking scenario that involves distances traveled by different animals. Students may determine the total distance traveled, or an unknown distance along a route using addition or subtraction within 100.

IEFA Integration Example: Maps Can Help Us

Context and Connection:

Understanding where places are, how far apart, and how people move between them is an important part of learning about and understanding how Montana communities connect, both historically and today. This task expands on the Grade 2 IEFA Social Studies lesson *Maps Can Help Us* and connects mathematics to the analysis of maps through the context of addition and subtraction of lengths.

While this specific activity is designed around locations on the Fort Belknap Indian Reservation, the reservation and federal trust lands of the A'aninin (Gros Ventre) and Nakoda/Nakona (Assiniboine) peoples, it could be easily modified for local relevance or adapted to reflect important locations to other Tribal communities.

Task Description:

This task connects directly to the Grade 2 IEFA lesson "Maps Can Help Us." Teachers may use it as an introduction, a companion activity, or a follow-up, depending on students' readiness and proficiency. The task can be scaffolded to appropriately align with students' familiarity with maps, distance keys, and place-based learning. While this version uses locations on and around the Fort Belknap Indian Reservation, which are the reservation and

federal trust lands of the A'aninin (Gros Ventre) and Nakoda/Nakona (Assiniboine), teachers can easily substitute any reservation or local community to increase local relevancy.

To set up the task, the teacher should give students a simple map of a Montana reservation, such as Fort Belknap. The map should label key locations, include approximate distances rounded for grade level-appropriateness, and the teacher may provide a table of distances, or, if students have experience using map keys, allow them to estimate distances using the scale.

Sample approximate distances, from the Fort Belknap Reservation:

Locations	**Approximate Distance on Map**
Fort Belknap Agency → Hays	35 miles
Fort Belknap Agency → Lodge Pole	33 miles
Hays → Lodge Pole	8 miles
Hays → Chinook	48 miles

Students will solve one- and two-step addition and subtraction problems using the distances shown on the map or in the table with encouragement to show their work and use any strategy or manipulative that helps them make sense of the numbers.

For example:

- A family travels from Fort Belknap Agency to Hays and then goes from Hays to Lodge Pole. How many miles total did they travel?
- A teacher planned to drive 60 miles. She traveled from Hays to Chinook to get supplies for her class. How many fewer miles did she travel than she planned?
- A community bus transports people to locations. The bus starts in Lodge Pole then visits Chinook. Then, the bus travels from Chinook back to the Fort Belknap Agency. What is the total distance the bus travels? (This one requires students to sum up the distances between Hays and Chinook and Chinook to Fort Belknap Agency.)

As an extension, students might be provided with a simple map of their local community or the reservation. They could pick two locations on the map, draw a line to show the route, and approximate the distance (if ready to engage the measurement standards that engage standard units of measurement). Students should then add one more stop to their route and repeat the first couple of steps. Finally, they can create their own two-step addition or subtraction story problem using their route. An example might include a simple map of their community where the student has identified the school, their home, and the community center, writing a story problem “I rode my bike from home to school, and then after school, I rode my bike to the community center. How far did I ride my bike?”

Students might also be engaged in the essential questions “What is a Tribe?”, “What is a reservation?” and “How do Montana reservations differ from one another?” They may also reflect on the importance of maps and how they or the adults in their lives use maps through reflections such as: “How

did the map help you understand distance problems today?", "Why is it important to know where places are?", "Which strategy helped you most when adding and subtracting distances?", etc.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 4.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive – Without context specific to a specific Tribe or Tribes, this task would achieve the "contributions" level. With context relating to tribally specific reservations, locations, or context, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- Maps Can Help Us – Montana Office of Public Instruction
- Tribal Territories in Montana Map – Montana Office of Public Instruction

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** use addition or subtraction within 100 to solve problems in context involving lengths that are given in the same units in context relating to Montana Indigenous Peoples and local communities without **intensive support**.
2. **Developing:** The student **can** use addition and subtraction within 100 to solve problems in context involving lengths that are given in the same units in context relating to Montana Indigenous Peoples and local communities with **some support**.
3. **Proficient:** The student **can** use addition and subtraction within 100 to solve problems in context involving lengths that are given in the same units in context relating to Montana Indigenous Peoples and local communities **with independence and accuracy**.
4. **Mastery:** The student **can** use addition and subtraction within 100 to solve problems in context involving lengths that are given in the same units in context relating to Montana Indigenous Peoples and local communities **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.6

Represent whole numbers as lengths from 0 and represent sums and differences within 100 on a number line.

General Notes:

This standard is an extension of students' understanding of number lines by engaging previous understandings to build awareness that numbers on a number line represent a distance from zero and that equal intervals represent equal units of length and to apply this awareness to represent sums and differences within 100.

Instruction often provides opportunities for students to construct, interpret, and use number lines to represent whole numbers, sums, and differences. Students may use strategies such as, but not limited to counting forward/backward, making jumps of tens and ones, or decomposing numbers to represent addition and subtraction. These should be some emphasis on the understanding that the distance between numbers represents the difference of values and that movement along number lines can model mathematical operations between numbers.

By developing proficiency in this standard, students' number sense, understanding of magnitude, place value reasoning, and computational flexibility are strengthened and their ability to engage with future concepts such as fractions, integers, and coordinate planes.

Instructional Examples:

- Students might use physical or drawn number lines to represent whole numbers as lengths from zero and model addition and subtraction with 100. They may demonstrate sums and differences using jumps along the number line and explain how the direction and length of each jump relates to the operation performed.
- Students might participate in station group work on the same sum or difference problem using vertical workspaces to record their thinking and number line representations. The teacher might then facilitate a gallery walk during which students may examine different number line representations of the same addition or subtraction problem. Students might identify similarities and differences among the representations, discuss how each illustrates the relationship, and consider whether the work accurately models the problem.
- Students might investigate the local high school football field using the yard lines as a model for a number line. The teacher may have students represent players' positions as distances from the zero-yard line and use jumps along a number line to model yards gained or lost during a game or play. Students may be asked to determine the new position of a player after a gain or loss, the distance between two positions, or the remaining distance required to score a touchdown.

IEFA Integration Example: Pryor Mountains

Context and Connection:

The Pryor Mountains (Baahpwuuo Awaxaawé) are an important geographical landscape with deep historical, spiritual, and cultural significance to Indigenous Peoples of Montana, in particular, the Apsáalooke (Crow) people. Since time immemorial, it has been a place for gathering plants and medicines, hunting, ceremonies, spirituality, and the transference of knowledge from one generation to the next. Many locations throughout the Pryors hold special meaning, contain delicate archeological sites, or have connections to traditional stories or spiritual beliefs of the Apsáalooke (Crow) people. For this reason, visitors are encouraged to learn about the significance of the area and to respectfully follow the guidance of Tribal Nations and land management bureaus when visiting to help protect archeological sites, sacred locations, and the natural environment.

Stories, teachings, and histories connected to the Pryor Mountains are best shared by Elders and Knowledge Keepers, whose perspectives can help to connect the landscape to the living history and culture of Indigenous Peoples of Montana. The following task will utilize a publicly accessible hiking trail within the Pryor mountains rather than culturally sensitive locations.

Task Description:

To introduce the task, the teacher may provide students with context about the Pryor Mountains and their significance to the Apsáalooke (Crow) people. Where reasonable and appropriate, the teacher might invite Elders, Knowledge Keepers, or community members with connections to the Pryor Mountains to share their experiences. The teacher may also choose to share one of the videos provided in the resources below that features Apsáalooke community members discussing the importance of the mountains.

Students should understand that the Pryor Mountains are important to many people for many different reasons. They should also understand that the mountains are part of the Crow Reservation and hold cultural, historical, and spiritual significance for the Apsáalooke people. Although the Apsáalooke have longstanding connections to the Pryor Mountains, other Tribal Nations, such as the Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne), have also traveled through and interacted with this landscape throughout history.

After hearing from members of the Apsáalooke Nation, students should reflect on what they learned. The teacher might ask questions such as:

- *What places have special meaning to you? Why are they important?*
- *Burton Pretty On Top spoke about asking permission before entering the homes of animals. Why do you think showing respect for nature is important?*
- *How do you show respect when you visit places in nature?*
- *How can we help protect Montana's natural places for future generations?*
- *How would you feel if a place that was important to you changed or disappeared?*

The teacher should then transition to the mathematical investigation by explaining: "Some areas of the Pryor Mountains are open to the public through hiking trails. Hikers often study a trail map before beginning to understand where they are going and how far they will travel. We will use information from a real hiking trail to explore how mathematicians use number lines to represent distance in class today."

The teacher might present students with either a simplified trail map or the following table of landmark distances. Photographs from the Demijohn Flat and Penney Peak Trail guide can also be utilized to help students visualize the space.

Landmark	Trailhead	South Junction	Demijohn Flat	Chugwater Junction	End of Trail	Penney Peak Summit
Distance from Trailhead (units)	0	24	29	39	43	48 (if using the spur)

Note: The landmark locations, and their order are based on the publicly available Demijohn Flat and Penney Peak Trail guide. To align with the mathematical expectations for grade 2, distances have been rounded and expressed in hundreds of meters while preserving the approximate relationships with landmarks along the trail. The task uses the language “units” to align with developmentally appropriate expectations.

Before introducing mathematics, the teacher should facilitate a Notice and Wonder routine by asking students to answer the questions: “What do you notice? What do you wonder?” Students should have time to reflect on these independently before sharing with a partner or small group. Strategies such as math journals, sentence stems, or turn-and-talk can support student reasoning and discourse. The teacher will need to record and discuss student observations prior to proceeding.

Next, the teacher should explain that each number shown on the map (or in the table) represents the approximate distance (in units) of a landmark from the trailhead. For example, the end of the main trail is 43 units from the trailhead. Then, the teacher might ask, “How is this trail map similar to a number line?” or, if using the table “How could these distances be mapped on a number line?”

Students should begin making observations such as:

- the numbers increase as hikers travel farther from the trailhead,
- each landmark represents a distance from zero,
- the spaces between numbers represent distances between locations, and
- distances can be compared by examining their positions on the number line.

Students should be provided with a blank number line and directed to use it to represent landmarks from the trail. Possible follow up tasks include (but are not limited to):

- Plot each landmark on the number line.
- Which landmark is closest to 30?
- Which landmark is farthest from the trailhead?
- How far is Demijohn Flat from Chugwater Junction? Show your thinking on the number line.

- If you hiked from the trailhead to the end of the trail, how far would you travel?
- Which two landmarks are closest together? Which are farthest apart? (Extension)
- Explain how the number line helped you compare distances.

To summarize learning, the teacher might facilitate discussion using questions such as:

- What helped you determine the distances between landmarks?
- How is a trail map like a number line?
- How do number lines help us represent and compare distances?
- Why is it helpful for hikers to understand distances before beginning a trail?
- Why is it important to stay on designated trails when visiting places like the Pryor Mountains?
- How can mathematics help us safely explore and understand the world around us?
- What did you learn today about the Pryor Mountains and why they are important to the Apsáalooke people?

Possible extension activities might include creating a trail map of landmarks around the school or community, representing distances between familiar locations on a number line, designing a poster encouraging visitors to care for an important place in their community, participating in a local trail clean-up, or working with a park, Tribal community, or local organization to create signs that encourage respectful stewardship of locally significant natural spaces.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 6, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, Transformation, or Social Action – Without context specific to a specific Tribe or Tribes, or without discussing the significance of the Pryor Mountains, this task would achieve the “contributions” level. With context relating to tribally or communally specific practices, beliefs, traditions, or stories, or, engagement of Indigenous voices, a slightly deeper depth might be engaged that would achieve the “additive” level. Connecting this task to stewardship of landscape or how different people experience landscapes, activates a level of depth and engagement for learners that rises to the “transformation” level. For a “social action” level, students would need to apply their learning to a community project such as a trail clean up, stewardship poster, interpretive sign, or any of the other extension activities recommended.

Relevant Resources:

- How We See It: A Story of Apsaalooke Landscape – D.J. Pretty On Top

- Crow Sacred Landscape – Burton Pretty On Top
- Crow Stories: The Little People – Grant Bulltail

Note: Many of the resources included above feature stories and perspectives shared by Elders and Knowledge Keepers, including discussions of cultural and spiritual beliefs. Teachers are encouraged to select resources that best meet the needs of their students and community and, whenever possible, collaborate with local Elders, Knowledge Keepers, or Tribal representatives to ensure instruction reflects local histories, cultures, and perspectives with accuracy.

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** represent whole numbers as lengths from 0 or represent sums or differences within 100 on a number line without **intensive support**.
2. **Developing:** The student **can** represent whole numbers as lengths from 0 and represent sums and differences within 100 on a number line with **some support**.
3. **Proficient:** The student **can** represent whole numbers as lengths from 0 and represent sums and differences within 100 on a number line **with independence and accuracy**.
4. **Mastery:** The student **can** represent whole numbers as lengths from 0 and represent sums and differences within 100 on a number line **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.7

Tell and write time from analog and digital clocks to the nearest five minutes using a.m. and p.m.

General Notes:

The standard builds off previous learning in both kindergarten and first grade as students increase their precision in telling and writing time to the nearest five minutes and use a.m. and p.m. to distinguish the time of day.

Instruction should provide opportunities for students to read, represent, connect, and write times presented in analog and digital formats. There should be some emphasis on understanding the relationship between the hour and minute hands, recognizing that each number the analog clock represents not only the hour, but also a five-minute interval, and understanding how the hour hand moves as minutes pass. Students should also interpret the hour and minute digits on digital clocks and context and may connect different representations of the same time as they work to tell or

write the time (e.g., through written descriptions, analog, or digital displays). Students should also connect a.m. and p.m. to familiar daily routines and recognize that the same clock time can occur twice during a day.

In communities and classrooms where students may have familiarity with the 24-hour clock system, such as through family members serving in the U.S. military, instruction may need to clarify that a.m. and p.m. are used with the 12-hour clock, while the 24-hour clock system, sometimes referred to as military time, does not require these designations.

Aside from the obvious benefits to one's lived experience, proficiency in telling and writing time strengths student understanding of time as a measurable quantity, provides an opportunity to reinforce skip counting, and supports later learning that involves elapsed time, time intervals, conversions between units of time, and problem solving in everyday contexts.

Instructional Examples:

- Students might use a classroom or school schedule to practice telling and writing time by reading times presented on analog or digital clocks, matching equivalent representations, or identifying whether activities occur in the a.m. or p.m.
- The teacher might facilitate a *Which One Doesn't Belong?* routine that shows four representations of time. Students may be asked to identify which representation they believe does not belong and justify their reasoning. The task should be designed in such a way so as multiple responses may be appropriate depending on students' reasoning.
- Students might create a schedule or announcement flyer for a familiar school or community event such as a field day, athletic event, graduation, powwow, fair, or other community celebration. Students should determine the times of different activities and create a poster, program, or schedule displaying each time to the nearest five minutes using analog and digital clocks and appropriate a.m. and p.m. designations. Students might share these schedules with classmates and explain how the different representations communicate the same time. For added problem- or place-based application, the teacher might connect this activity to an actual event and invite students to develop and propose a schedule to school administrators or school board.

IEFA Integration Example: Powwow Schedule

Context and Connection:

Powwows are vital intertribal gatherings where Indigenous cultures are celebrated through dance, music, regalia, food, ceremony, and community. Though each Powwow is unique, many include songs and dances that honor Veterans, recognize community members, celebrate families, and bring people together. Powwows are held throughout Montana and across North America. Each Tribal Nation and community may have its own protocols, songs, order of events, and traditions, but there are often commonalities between events. Visitors should always follow the guidance of event organizers and observe respectfully.

While Powwows typically announce the starting time for the day's events, activities often proceed according to the flow of the gathering rather than a detailed minute-by-minute schedule. For this reason, the schedule used in the following task is a simplified, OPI-created example designed to provide

opportunities for students to practice reading analog and digital clocks. Teachers are welcome to increase the local relevancy by modifying the sample schedules provided in partnership with local Tribal leaders, Knowledge Keepers, or other expert community members.

Task Description:

To introduce the task, the teacher should review the purpose of Powwows as community gatherings that celebrate culture, honor traditions, and bring people together. The teacher should consider inviting a Knowledge Keeper, dancer, singer, Elder, or member of a Powwow organization committee to share their experiences. They may also use the Montana OPI Powwow Guide to introduce students to the different songs, dances, and cultural experiences they may observe or experience during a powwow. For a literature connection, the teacher may consider reading the book *Bowwow Powwow* by Brenda J. Child or *Jingle Dancer* by Cynthia Leitich Smith. Students should understand that while every powwow is unique, many follow an order that help dancers, singers, visitors, and families know when important events will take place.

Students should understand that while every powwow is unique, powwows generally follow an order of events instead of a strict minute-by-minute schedule. Certain activities, such as grand entry, may have announced starting times, while the timing of individual songs and dances may vary as the event takes place. To activate prior knowledge and to connect to students' lived experiences, the teacher might ask students questions such as: “Have you ever attended a community celebration with an announced starting time?” or “Why might it be helpful to know when an event begins?”

Teachers should explain that pow wows typically announce starting times for major events rather than publishing exact times for every song or dance. For this task, students will use a simplified sample schedule inspired by a powwow to practice telling and writing time. Teachers are encouraged to adapt the example using local context or expertise to increase relevancy to their community. When developing or modifying schedules, teachers should ensure that times occur in five-minute intervals in order to increase alignment with the standard. Teachers should clarify that the sample schedule is designed for mathematics instruction and is not representative of the exact timing or sequence of events at every powwow.

Sample School Powwow Celebration Schedule

Expected Start Time	Event / Activity	Description
Nine o'clock a.m.	Arena Opens	Arena doors open for setup, vendor preparation, and family arrivals.
Nine fifteen a.m.	Registration	Dancers check in, receive contest numbers, and drum groups register.
Eleven o'clock a.m.	Grand Entry	Procession of flag bearers, honor guards, veterans, royalty, and all dance categories entering the arena.
Eleven thirty a.m.	Flag Song & Veteran Song	Traditional honor songs performance and posting of the colors.

Eleven forty-five a.m.	Intertribal Dance	Open social dance for all participants, visitors, and families to dance together.
Twelve o'clock noon	Tiny Tots	Boys & Girls Combined Traditional
Twelve ten p.m.	Tiny Tots	Boys & Girls Combined Grass & Prairie Chicken
Twelve twenty p.m.	Tiny Tots	Boys & Girls Combined Fancy Shawl & Jingle
Twelve thirty p.m.	Community Game: Cake Walk	First cake walk activity in the arena between dance divisions.

Note: *This schedule is a simplified instructional example. Actual powwow schedules and orders of events may vary by community and celebration.*

Student students should use the sample schedule to complete a variety of activities. Teachers might provide movable analog clocks, paper clocks or digital clock displays to support students in representing and interpreting time. Teachers should present event times in multiple formats, including analog clocks, digital clocks, and written expressions, to help students recognize and connect different representations of the same time. For example, students might read a time from a schedule, represent it on an analog clock, and write the corresponding digital time.

Example questions and prompts may include:

- Draw the hands on an analog clock to show when grand entry begins.
- Write the digital time for the start of the intertribal dance.
- Show 11:30 a.m. on an analog clock. Which event begins at that time?
- Which event begins at 12:30 p.m.? Write its start time in words.
- Does the tiny tot's traditional category begin in the a.m. or the p.m.?
- An analog clock shows 11:30 a.m. Which event is scheduled to begin?

After completing the activities, students should compare their clocks and discuss their thinking with partners or small groups. The teacher might facilitate discussion among students using prompts such as "How can we show the same time using an analog and digital clock?", "How do we know whether a time is in the a.m. or p.m.?", or "What did you learn about powwow songs or dances that you would like to explore further?"

As an extension, students might create a schedule for another community celebration or classroom event by writing the time for each event using analog and digital clocks. Students could also compare schedules from two different Powwows and discuss what is similar and what is different to reinforce that each community's celebration is unique.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive – Without context specific to a specific Tribe or Tribes, this task would achieve the "contributions" level. With context relating to tribally specific events, locations, or context, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- Your Guide to Understanding and Enjoying Powwows – Montana Office of Public Instruction
- Bowwow Powwow Language Arts Model Teaching Unit – Montana Office of Public Instruction
- Powwow 101 Playlist – Calgary Stampede

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** tell or write time from analog or digital clocks to the nearest five minutes using a.m. and p.m. without **intensive support**.
2. **Developing:** The student **can** tell and write time from analog and digital clocks to the nearest five minutes using a.m. and p.m. with **some support**.
3. **Proficient:** The student **can** tell and write time from analog and digital clocks to the nearest five minutes using a.m. and p.m. **with independence and accuracy**.
4. **Mastery:** The student **can** tell and write time from analog and digital clocks to the nearest five minutes using a.m. and p.m. **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.8

Solve problems in context involving dollar bills, quarters, dimes, nickels, and pennies using $ and ¢ symbols appropriately.

General Notes:

This standard builds on students' previous learning in Grade 1 by involving multiple monetary denominations, symbols, and contextual applications. Students may apply their understanding of place value, addition, subtraction, and counting to determine and reason about monetary values while using the dollar ($) and cent (¢) symbols in ways that are appropriate for the problem and context.

Instruction may provide students with opportunities to identify and determine the values of coins and bills (a predecessor skill), combine different denominations, and solve problems that involve money. These may include, but are by no means limited to, examples such as determining costs of purchases, comparing amounts, or determining how much remains after a transaction. Students may be supported through physical or visual representations of money, as well as strategies such as skip-counting, equations, or other computation methods. There should be some emphasis placed on understanding relationships between denominations, recognizing that the same monetary value can be represented in different ways, and distinguishing between dollars and cents when recording amounts.

Aside from the obvious applications to everyday life, when students develop proficiency in solving problems involving money, they gain number sense, place value reasoning, and computational flexibility in addition to financial literacy, decimal understanding, and practical problem-solving skills. This standard provides particularly strong opportunities to connect with Montana's financial literacy standards.

Instructional Examples:

- Students might solve various word problems involving money such as determining total cost of multiple items, putting together a budget, withdrawing from or adding to an account, or determining whether they have enough money to make a purchase.
- The teacher might present students with sample work that contains an error such as incorrect combination of values or different denominations, miscounting coins, or using dollar and cent symbols incorrectly. Students should identify and explain the error, determine the correct value or solution, and discuss how the error might have been avoided.
- Students might participate in a simulated classroom marketplace using play dollar bills and coins. When given an item with a particular price, students select money from their pretend wallets to pay the salesperson. Students should then compare the combinations of bills and coins they used, discuss whether the different combinations represent the same monetary value, and, as a possible mastery extension, reason about which combination may be the most efficient. The teacher might also extend the activity by asking students to determine whether they have enough money to make the purchase, or how much money would remain afterward.

IEFA Integration Example: Indigenous Businesses

Context and Connection:

Across Montana, many Indigenous entrepreneurs create and operate businesses that reflect their skills, culture, communities, and worldview. Businesses such as Montana Baskets, Native Fish Keepers, Inc., Sunshine Can-dles and Iniskimauki Designs constitute a small representation of the entrepreneurs and artisans with connections to numerous Tribal Nations within Montana. These businesses, featured in the PBS series *Made in Montana*, offer a robust variety of goods and services and demonstrate the diversity of Indigenous entrepreneurship and contributions made to Montana's economies, communities, and environment.

Understanding how currency is used to buy, sell, and make decisions is a vital skill for participating in and supporting business and the state's economy. The following task frames these skills through solving problems involving money while recognizing ongoing presence and contributions of Indigenous-owned businesses to the state's economy and local communities. To increase the relevance of this task, teachers are encouraged to seek out local examples of businesses owned or operated by Indigenous Peoples to modify the task appropriately.

Task Description:

To introduce the task, the teacher might ask students to provide examples of businesses in their communities, then the teacher might share that Montana is home to many small businesses, making up over 99% of businesses in the state, and employing the majority (67%) of employees. Of these businesses, over 3,500 are owned by Indigenous Peoples (SBA Office of Advocacy, 2025). Small businesses contribute heavily to the state's economy, providing jobs, income, goods, and services to people around the state and beyond.

The teacher might then highlight one or more Indigenous-owned businesses, either through a local example, a guest speaker, or resources provided below, such as the *Made in Montana* video produced by PBS. Students should understand that business owners often use mathematics to make decisions about factors such as determining prices, making purchases, giving change, and tracking earnings. The teacher will then introduce the activity by explaining that students will work together to solve real-world money problems connected to real-life businesses. During the activity, students will engage in small group rotations to solve, analyze, and discuss different scenarios involving dollar bills, quarters, nickels, and pennies.

Students should be organized into small groups appropriate to the local context. Each group will begin with one scenario card connected to a specific Indigenous business. Scenarios should involve realistic situations such as purchasing items, combining amounts of money, or determining how much change is needed.

Round 1: Solve

Students will work together in their groups to solve the scenario. They should represent their thinking through drawings, manipulatives (such as play money), equations, or written explanations. The teacher should encourage students to use the correct symbols ($ and ¢), check for accuracy, and justify their reasoning.

Round 2: Analyze and Revise

Groups will rotate to a new scenario and review the previous group's work. As a group, students will decide whether they agree with the previous group's solution and reasoning. Based on these observations, they will confirm or revise the work if needed. Students should be encouraged to explain their thinking and justify any changes they make.

Round 3 (Optional): Compare Strategies

If there is enough time, groups might rotate once more or return to their original problem to review how different groups approached the task. Students should compare the strategies used and consider which approaches were the most efficient, accurate, or easy to understand.

Providing sentence stems such as "I agree because…", "We solved by…", "I think we should try…", etc., or using structured strategies such as turn-and-talk, active listener, etc., might support students in engaging in discourse.

After groups complete the rotations, the teacher should lead a whole group discussion using reflection prompts such as: "How did math help solve problems in these business contexts?", "What strategies helped you the most when you were working with money?", "How did checking another group's work help you think more carefully?", "Why is it important for business owners to be accurate when working with money?", etc.

For extension, students might create their own business scenario involving money, solve it, and exchange with a classmate. Additionally, setting up a simple classroom "market" where students practice buying and selling items might help students explore how pricing choices can affect a business.

Note: Below are two sample scenario cards -

Card #1

Whitebear Moccasins is a company based in Bozeman, Montana. They design moccasins for their clients that feature custom combinations of leathers, fabrics, designs, and beadwork options. They also design products like wallets, bolo ties, baby moccasins, powwow fans, and leather conditioner.

Scenario:

Whitebear Moccasins has a booth at Crow Fair. A client decides to purchase a pair of baby moccasins for $42. The client pays two twenty-dollar bills and a five-dollar bill. How much did they pay? What change should they receive back?

Card #2

Iniskimauki Designs is a business in Browning, Montana that sells ribbon skirts, baby onesie ribbon skirt sets, men's ribbon shirts, jingle dresses, belts, shawls, and other items.

Scenario: The owner of Iniskimauki Designs, Lola Wippert, is ordering supplies for some dresses she plans to make. A package of 25 jingles costs $5.75. Show two different ways Lola could pay for the jingles using dollars and coins.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 5, EU 6.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– This task rises to the contributions level through its engagement of the context of Indigenous-owned businesses. With context relating to specific businesses, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- Made in Montana: Indigenous Business – Montana Public Broadcasting Station (PBS) *(Be advised: Sunshine Can-dles (17:30) repurposes cans and containers of all kinds, some of which may not be suitable for school settings. Teachers should make decisions appropriate for their local context.)*
- 2025 Small Business Profile – Small Business Administration
- Featured Artists – Indigenous Made Montana

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** solve problems in context involving dollar bills, quarters, dimes, nickels, or pennies using $ or ¢ symbols appropriately without **intensive support**.
2. **Developing:** The student **can** solve problems in context involving dollar bills, quarters, dimes, nickels, and pennies using $ and ¢ symbols appropriately with **some support**.
3. **Proficient:** The student **can** solve problems in context involving dollar bills, quarters, dimes, nickels, and pennies using $ and ¢ symbols appropriately **with independence and accuracy**.
4. **Mastery:** The student **can** solve problems in context involving dollar bills, quarters, dimes, nickels, and pennies using $ and ¢ symbols appropriately **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.9

Generate measurement data and present the data in multiple ways. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

General Notes:

This standard advances students' understanding of measurement by introducing the collection, organization, and representation of measurement data with contextual meaning.

Instruction may provide opportunities for students to generate measurement data, organize their findings, and represent the data in multiple ways. Examples of representations may include tables, line plots, picture graphs, bar graphs, and tally charts, as appropriate for the data collected. Teachers may encourage students to discuss how different representations communicate information about the same data set and describe what they notice at a developmentally appropriate level. Learning experiences should also engage contexts that are relevant to local communities and Montana's Indigenous Peoples.

Proficiency in this area can strengthen students' sense of measurement, data literacy, and communication about mathematics while also supporting their future ability to engage with more sophisticated data analysis, statistics, and interpretation of information as informed citizens.

Instructional Examples:

- Students might collect measurement data from familiar classroom objects such as books, pencils, or other school supplies. They may organize their measurements in a table or tally chart and present the dame data using another representation, such as a line plot. This can be completed independently or with classmates.
- The teacher might prepare identical sets of objects for each workstation, such as pieces of string or yarn cut to varying lengths. They should ensure that each set contains the same number of pieces at each length to standardize the data set students will work with. Students may then measure the objects, record their findings, and present their measurement data in multiple ways using vertical, nonpermanent surfaces (e.g., whiteboards or clear sheet protectors). Students may then rotate among workspaces to examine their classmate's work and discuss similarities, differences, and observations across the displays.
- Students might use appropriate collection practices to participate in a nature walk to collect leaves, pine needles, or other plant materials. They may measure and record their findings, then present the data in multiple ways. This can be completed as a whole class, small group, or independent activity. Teachers may consider limiting the number of items to be collected to maintain a manageable data set. The investigation may also be enriched by inviting classroom visitors such as a local Knowledge Keeper, community member, forester, natural resource specialist, or nature center or nursey staff to share knowledge about local plants, ecosystems, and culturally appropriate and environmentally responsible harvesting practices.

IEFA Integration Example: Ribbon Skirts & Shirts

Context and Connection:

Ribbon skirts and shirts are symbols of cultural identity, pride, and resilience for many Indigenous people across North America, including in Montana. Though ribboned attire can be worn for ceremonies and celebrations, they can also be worn as an everyday expression of a person's identity and spirit. Although stories about the origin of these articles vary in ways unique to each Tribe, many traditions describe ribbon skirts and shirts as connecting wearers with the moon and honoring the wearer's sacred role as a giver of life or protector of tradition.

In recent years in Montana, ribbon skirts or shirts have become visible in schools during homecoming week, spirit week, graduation, and athletic senior nights, when students are encouraged to wear them. Nationally, posts can be found across social media on January 4th as a celebration of the National Ribbon Skirt Day, and public officials like former Interior Secretary Deb Haaland sometimes wear their ribbon skirts during swearing in ceremonies.

Many tribes have specific traditions, stories, and conventions surrounding ribbon skirts and shirts, and learning about the specific significance to a local Tribe, perhaps by inviting a knowledge keeper into the classroom would be a powerful addition to this activity. Today, ribbon skirts are custom designed with colors or patterned fabrics that hold personal, cultural, or spiritual meaning to the wearer. Some makers make ribbon skirts to sell or share with their community, like Lola Wippert (Iniskimauki Designs), an enrolled member of the Blackfeet Tribe. Some communities work together across generations with younger members being guided by mentors in choosing designs, measuring, and sewing. This passing down knowledge from one person to the next preserves the tradition for future generations.

Task Description:

To introduce the task, the teacher may share examples of ribbon shirts or skirts using photographs, videos, literature, or examples provided by a local maker or Knowledge Keeper. Suggested resources include the book *What Your Ribbon Skirt Means to Me: Deb Haaland's Historic Inauguration* by Alexis Bunten, and the PBS Video: Indigenous Business (start at 22:03). The teacher should emphasize that these clothing items are symbols of identity and strength and that designs, stories, and traditions often vary by Tribe, family, or individual. If possible, the teacher may provide a ribbon skirt or shift for students to observe. As students engage with these materials, the teacher may prompt discussions with questions like: "What do you notice about the colors and patterns?", "How might clothing show something about who a person is or where they come from?", etc.

The teacher will then transition to the mathematical task by explaining that making ribbon shirts or skirts can require measuring and organizing ribbons of different lengths, colors, or patterns. Students will collect measurement data about ribbons and represent it in different ways.

Teacher notes: Ribbon skirts and shirts vary by size and design, so there is no single standard length for a garment and its decorative ribbons. Measurements depend on the intended wearer, garment dimensions, and design features. For this task, teachers may select or approximate ribbon lengths appropriate for their students' measurement skills and these to not need to necessarily correspond to a particular garment. The teacher should prepare strips of ribbon (or yarn or colored paper) in selected whole-inch lengths and ensure that some measurements are repeated to result

in meaningful data representations. For increased authenticity, consider connecting with a maker or Knowledge keeper to determine realistic lengths for different sized garments.

Distribute one or two strips to each student. Students should measure their strops using rulers or other appropriate measurement tools, then record their measurements in whole inches. Once measurements have been recorded, the teacher should facilitate a class sharing process so students can record the complete data set, including any repeated measurements. The teacher should not organize the data for students and instead, allow them to investigate how it might be represented through prompts like: “Do any measurements repeat?”, “Which lengths appear most often?”, or “How could we organize this information clearly?”

Representation Task

The teacher will guide students in considering how the same data can be organized and displayed in different ways. Prompts might include questions such as: “What should we include in this representation?”, “How can we make our data clear to someone else?”, “What should each symbol or square represent?”, or “How can we check that our representation includes all the data?”

Students may fold a piece of paper into four sections or use an alternative recording format to represent the class data set as follows:

(1) Data List: record the measurements collected by the class.
(2) Frequency Table: Use tallies, numbers, or both, to organize the measurements by length and record how many times each length occurred.
(3) Bar Graph: Display the frequency of each ribbon length using bars, with appropriate labels and a scale of one.
(4) Line Plot: Display the measurements on a number line marked with whole-inch units. Have students place a symbol (such as an X) above each measurement to show frequency.

As students construct representations, the teacher may encourage partner or group discussions about how to organize and communicate the information accurately.

Discussion and Comparison

Students will work in pairs or small groups to analyze and compare their representations. The teacher may use discussion protocols, independent reflections, or guiding questions such as: “How is the data the same in each representation?”, “How is each representation different?”, “Which representation helps you understand the data the most quickly?”, “Which one was the easiest or most challenging to create? Why?”

Reflection

To close the task, students might reflect using prompts such as: “How did measuring and recording ribbon lengths help us collect information for our data set?”, “How did different representations help us see patterns?”, “What information was easier to understand when we organized the measurements into a graph or table?”

Potential enrichment or extension opportunities might include coloring a picture of ribbon skirts or shirts, rearranging the data by color instead of length and repeating the task, or, with guidance from a local maker or Knowledge Keeper, explore how measurement is used when designing or making a ribbon skirt or shirt.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– Without context specific to a specific Tribe or Tribes, or individuals, this task would achieve the "contributions" level. With context relating to specific practices, beliefs, traditions, or stories, or engagement with a knowledge keeper or maker, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- The Story of the Ribbon Skirt – Seven Generations Education Institute
- *What Your Ribbon Skirt Means to Me: Deb Haaland's Historic Inauguration* by Alexis Bunten
- Ribbon Skirt Tutorial – Galt Museum
- Indigenous Business – Montana Public Broadcasting Station (PBS) (Time 22:03 includes an interview with maker Lola Wippert of Iniskimauki Designs (Blackfeet Tribe). It is recommended that teachers limit the use of this video with this task to the section highlighting Iniskimauki Designs.)

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** generate measurement data or present the data in multiple ways within contexts relating to Montana's Indigenous Peoples and local communities without **intensive support**.
2. **Developing:** The student **can** generate or present measurement data in multiple ways or engage both skills with **some support,** within contexts relating to Montana's Indigenous Peoples and local communities.
3. **Proficient:** The student **can** generate measurement data and present the data in multiple ways **with independence and accuracy,** within contexts relating to Montana's Indigenous Peoples and local communities.
4. **Mastery:** The student **can** generate measurement data and present the data in multiple ways **with independence and accuracy,** within contexts relating to Montana's Indigenous Peoples and local communities. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.10

Organize, represent, and interpret data with up to four categories. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

General Notes:

This standard builds off students' previous learning with data by extending their ability to organize, represent, and interpret categorical data up to four categories. Categorical data consists of information organized into distinct groupings or classifications (e.g., types of transportation, favorite activities, kinds of plants, etc.). Students begin to develop an understanding of how data can be organized and displayed in order to communicate information and answer questions of interest.

Instruction may provide opportunities for students to organize and represent categorical data by using displays such as, but not necessarily limited to, tally charts, tables, picture graphs, and bar graphs. Students may also interpret data by identifying quantities, comparing categories, and answering questions about the information presented. There should be some emphasis placed in understanding how representations communicate information and using the data to support mathematical reasoning. Instruction may introduce or reinforce common features of data displays, (e.g., titles, labels, axes, and keys) to help students understand how these features support interpretation. Teachers might choose to provide these features, model their use, or support students in developing them as appropriate for their readiness. Learning experiences should also incorporate cultural contexts that relate to Montana's Indigenous Peoples and local communities.

Proficiency in these skills strengthens students' data literacy, reasoning, and communication skills and supports student access to later learning that involves more sophisticated data analysis, statistics, and interpretation of information as informed citizens.

Instructional Examples:

- Students might conduct a classroom survey involving no more than four categories (e.g., preferred recess activities, favorite school lunches, favorite game, etc.). Students should organize their findings using tally charts or tables, represent the data using an appropriate graph, and answer questions about the quantities and differences between the categories. In smaller classrooms, teachers might provide additional survey responses or combine data from multiple classrooms to create large enough data sets for students to work with.
- The teacher might facilitate a *Notice and Wonder* or *Slow Reveal* routine using a picture graph or bar graph. Students may share observations they make about the display, including any quantities, labels, or other features. The teacher may then ask students to interpret the data by drawing comparisons between categories, identifying how many more or fewer are resented, and explaining how the graph supports their conclusions.

- Students might investigate categorical data related to their school, community, or Montana's Indigenous Peoples. Using information gathered from appropriate local resources, or community or state partners, students may organize and represent data and interpret their displays by answering questions about the information presented. They may be supported in interpreting their data through strategies such as *sentence stems* or *three questions* routine. As a possible extension, students might work as a class to summarize and share their findings with a school or local newspaper.

IEFA Integration Example: Traditional Games - Ring the Stick

Context and Connection:

Ring the Stick, or Ring and Stick, is a traditional game with variations appearing across many Tribal Nations. This task specifically engages the style played by the Ksanka/Ktunaxa (Kootenai) and Ne-i-yah-wahk (Plains Cree), however, variations of this game appear in several other Tribal Nations including the Niitsitapi/Amskapi Pikuni (Blackfeet), Nakoda/Nakona (Assiniboine), Lakota, Dakota (Sioux), and Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne). As explained by TJ IronBear of the Great Falls Indian Education Department, the game builds hand-eye coordination and focus. Traditionally, the Kootenai crafted the ring and stick from wood and sinew, while the Cree used bone, wood, and sinew. Although the goal is simple (swing the hoop upward and driving the stick through the opening) the challenge is in the high level of coordination and concentration required to achieve success. These games are still played today in a variety of contexts and applications in communities across Montana.

This task builds off of a task from Grade 1 and is accompanied by an OPI IEFA Lesson Plan: Data Analysis of Ring the Stick. In the activity, students learn about the traditional game while collecting measurement data, organizing their findings and presenting the results in multiple ways.

Task Description:

The teacher should introduce the game Ring the Stick, explain its cultural significance, and, if possible, show students replicas of the materials, the video by TJ IronBear and the Great Falls Indian Education Department, or invite local experts or Knowledge Keepers to present to the class.

Students should discuss why games like this require skill and why they might be enjoyed by peoples both in the past and currently. They might also discuss what practical skills this game might have historically helped develop (e.g., hunting, hand eye-coordination, focus, perseverance, etc.).

Students will then make predictions about the number of successes and total attempts, recording this prediction on paper. After predictions are made, students will play the game in small groups or pairs, tossing the hoop and recording successful attempts. As a class, students will represent the collected data in more than one way, such as:

- Line Plot (or Dot Plot): Showing how many students achieved each number of successes, using dots or other symbols above a number line.
- Bar Graph: Showing how many students achieved each number of successful catches.
- Pictograph: Using pictures or symbols to show how many students achieved each number of successes.
- Table: Organizing students predicted and actual numbers of successful catches by comparison.

Note that, if the teacher does not have access to the materials required to play the game, the activity could be easily modified by having students watch the video from TJ IronBear and the Great Falls Indian Education Department, and having students record the results from both the small and large materials.

The teacher should lead a discussion where students are welcomed to compare their chosen representation, using prompts such as “What do we notice?”, “Which display makes the data easiest to understand?”, “How many students had the same result?”, “Who was the most successful?”, etc.

Students should be invited to compare their initial predictions with the results, through questions such as “How many students predicted correctly?”, “Was the game harder or easier than expected?”, “What skills helped students improve accuracy?”, etc. Students can also reflect on the cultural aspects through questions such as “Why do you think Ksanka and Ne-i-yah-wahk children enjoyed this game?”, “Why do you think people still play this game to this day?”, “What skills or strengths did this game help you practice?”, “How is this game similar to other games you play?”, etc.

This activity could be optionally extended by repeating it with different numbers of total attempts, or results from different classes, then comparing how the data patterns change. Local relevance could be improved by introducing variations of the game specific to local Tribes or communities.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– This task rises to the contributions level through its engagement of the game through a generalization of Tribal traditional games. With context relating to tribally specific practices and the purpose of the game in specific societies, a slightly deeper depth and engagement might be engaged that would achieve the “additive” level.

Relevant Resources:

- Data Analysis of Ring the Stick Lesson Plan – Montana Office of Public Instruction
- Native American Traditional Games – Montana Office of Public Instruction
- Traditional Games Units – Montana Office of Public Instruction
- IEFA Traditional Game: Ring the Stick – Great Falls Public Schools Indian Education Department

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** organize, represent, or interpret data with up to four categories within cultural context relating to Montana Indigenous Peoples and local communities without **intensive support**.

2. **Developing:** The student **can** organize, represent, and interpret data with up to four categories within cultural context relating to Montana Indigenous Peoples and local communities with **some support**.
3. **Proficient:** The student **can** organize, represent, and interpret data with up to four categories within cultural context relating to Montana Indigenous Peoples and local communities **with independence and accuracy**.
4. **Mastery:** The student **can** organize, represent, and interpret data with up to four categories within cultural context relating to Montana Indigenous Peoples and local communities **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.MD.11

Solve addition and subtraction problems of all types using data presented.

General Notes:

This standard requires students to combine addition, subtraction, and data interpretation skills to problems solving problems using data presented to them. Students must therefore extend their mathematical reasoning by identifying relevant information, recognizing relationships between quantities, and determining appropriate operations to solve problems.

Instruction may provide students with opportunities to solve addition and subtraction problems of all types. These may include put together, take apart, and compare problems that engage data presented in displays such as bar graphs, picture graphs, tables, or other developmentally appropriate displays with no more than four categories. Students may use strategies such as drawings, equations, or other representations to organize information and communicate their reasoning. Students should be supported in learning to understand relationships between quantities and selecting appropriate operations instead of relying solely on keywords or computation in isolation.

Developing proficiency in this standard can strengthen computational flexibility, data literacy, and mathematical reasoning abilities while also supporting later, more sophisticated learning in data analysis, multi-step problem solving and informed decision making.

Instructional Examples:

- Students may solve addition and subtraction word problems based on information presented to them in data displays. Students may be asked to combine quantities, identify unknown parts, or compare categories. They may also be asked to identify relevant information from the display and select appropriate strategies to solve problems.

- The teacher might facilitate a *Slow Reveal Graph* routine by gradually revealing parts of a graph. At each stage, students may be asked to share observations, ask questions, or form predictions, or refine thinking about the information presented to them. Once the graph is fully revealed, students will use the data to pose and solve addition and subtraction problems.
- Students might investigate data about books available or borrowed from their local, school, or classroom library, limited to four categories. Using a graph or table displaying this information, student may solve addition and subtraction problems involving the different categories presented. As an extension, students may develop their own questions for classmates or use their findings to inform a class discussion about library resources or usage.

IEFA Integration Example: Veteran Populations

Context and Connection:

According to the United Service Organizations (USO), Indigenous Peoples serve in the United States' Armed Forces at a rate five times higher than any other ethnic group on a per capita basis (DeSimone, 2021). Native peoples from across the United States have a long history of military service and leadership, serving from the revolutionary war to present-day military operations. While many will be familiar with the Navajo Code Talkers, Tribal Nations within Montana also contributed to military communications during World War II, including the Apsáalooke (Crow), Nakoda/Nakona (Assiniboine), and Lakota, Dakota (Sioux) code talkers. Distinguished leaders such as Dr. Joseph Medicine Crow (Apsáalooke [Crow]) also played important roles in military history and veterans such as Jamie Fox (Nakoda [Assiniboine], Aaniiih [Gros Ventre], and Métis) represent the continued tradition of service among Indigenous communities today.

This task involves data related to civilian veterans currently living within reservation and off-reservation trust lands in Montana. The data was drawn from the United States Census Bureau's "My Tribal Area" resources and reflects estimates for populations of veterans living in these geographic areas of Montana. Therefore, it does not capture all veterans of Indigenous heritage living elsewhere in Montana or the United States, and some individuals recorded in the data set may not identify as Indigenous or hold Tribal citizenship through enrollment. Some reservation areas, such as the Flathead Reservation, include values that exceed Grade 2 number expectations. These larger quantities were intentionally included to honor and recognize the service and contributions of all Tribal veterans in the data set but may be more appropriately used for informal comparisons or extension opportunities rather than the core task. The limitations of this data set serve as an opportunity to introduce students to early data literacy by helping students understand that while data can teach us important information, we should also think about questions such as how the data was collected, who may not be represented, and what conclusions we can reasonably interpret from the information provided.

Task Description:

The teacher should begin by sharing some background information about the armed forces, what it means to be a veteran, and the role veterans and active-duty service members play in communities across Montana and the United States. Teachers may invite students to share whether they know any family or community members who have served, invite a local veteran or service member to speak, visit a local military memorial site, or utilize one of the resources, videos, biographies, or lesson plans linked below. Students should understand that Indigenous Peoples have participated in the

military history of this nation since before it was a nation, continue to serve at rates five times higher than any other ethnic group on a per-capita basis, and have played important roles in shaping the military history and leadership of both Montana and the United States.

The teacher will then share a simple bar graph displaying no more than four categories provided in the table here:

On-Reservation and Off-Reservation Trust Land (Tribal Nations)	Rocky Boy	Fort Peck	Blackfeet	Crow	Fort Belknap	Northern Cheyene	Flathead*
Civilian Veterans	82	425	309	210	169	142	2328

Data Source: (United States Census Bureau, 2024) * **Note:** As stated in the context and connections section, the Flathead value (2328) is not on par with grade-level expectations and should only be included for advanced students or to support informal comparisons.

The teacher should then lead a class discussion or reflection using prompts such as, “What did you notice?” and “What do you wonder?” while engaging students in a data talk about the graph or table. To increase engagement, the teacher may use a slow reveal graph to gradually introduce the data, (though this would need to take place prior to the lesson introduction). Students should develop primary understanding of the labels, categories, values, and what the data represents before solving problems with the information.

The teacher may then pose a comparison question such as, “Which reservation area has more veterans than the Fort Belknap area?” followed by a deeper question such as, “How could we figure out how many more veterans live in Fort Belknap than in Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne) territory?” Students should discuss possible strategies through a turn-and-talk, small-group discussion, or whole class conversation before solving. Teachers should provide access to tools that support mathematical thinking such as drawing materials, base-ten blocks, number lines, or place value manipulatives. Selected students or groups may share and compare strategies through a class discussion after solving.

Students should then generate their own addition, subtraction, compare, put together, or take apart questions about the data using teacher-provided sentence stems. Some examples include:

- How many more veterans live in ___ than ___?
- How many veterans live in ___ and ___ combined?
- How many fewer veterans live in ___ than ___?
- If we combine the veterans from ___ and ___, what would the total be?
- Which areas together would have more than ___ veterans?

Students will then work in groups to evaluate and solve student-generated questions about the data. First, each student should fold a piece of paper into four quadrants and write their own question in the first quadrant. Next, students will pass their paper to a peer, who will draw a representation of the problem in the second quadrant. The paper should then be passed to a third student, who will write an equation to match the scenario in the third quadrant. During the fourth round, another student will solve the problem and evaluate whether the representation and equation are accurate. Finally, the paper should be returned to the original student, who will review the work completed by the group and lead a discussion about whether the representations, equations, and solutions are correct and how they could be improved if needed.

The lesson should conclude with a whole-class discussion about the data and the math used to make sense of it. Discussion questions may include: "What did we learn from this data?", "What does this information tell us about veterans in Montana?", "Who may not be represented in this data set?", "What additional information would we want to know?", and "How might data like this be used in communities?" These conversations provide opportunities to build early data literacy and help students understand that while data can be informative, it can also have limitations based on how it was collected and who is represented.

Extension opportunities may include the National Indian Education Association Grade 2 poetry lesson linked below, a visit to a local memorial site, or a field trip or classroom visit with a local V.A., V.F.W., Tribal veterans' organization, or active-duty service member.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 4, EU 6.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to Indigenous perspectives, stories, or Montana-specific Tribal histories, this task would achieve the "contributions" level. With context relating to Tribally specific experiences, practices, or histories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task to reflection questions about representation and interpretation of data, Tribal voices, or community perspectives, activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Honoring our Native Veterans: Warriors in Uniform – National Indian Education Association
- Grades 1-2 Lesson Plan: Changing Perspectives – National Indian Education Association
- American Indians in the Military: A Warrior Spirit – Montana Office of Public Instruction
- Resources for Teaching about American Indians in the Military – Montana Office of Public Instruction
- Backroads of Montana: A Salute to Veterans – Montana Public Broadcasting Station (PBS)
- This Native American Veteran Carried Lessons – and a Pebble – Into War – Public Broadcasting Station (PBS)

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** solve addition or subtraction problems of all types using data presented without **intensive support**.
2. **Developing:** The student **can** solve addition and subtraction problems of all types using data presented with **some support**.
3. **Proficient:** The student **can** solve addition and subtraction problems of all types using data presented **with independence and accuracy**.

4. **Mastery:** The student **can** solve addition and subtraction problems of all types using data presented **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.G.1

Recognize and draw shapes having specified attributes.

General Notes:

This standard builds off students' previous geometric shape learning by extending their ability to recognize and draw shapes based on specified attributes. Relevant shapes for Grade 2 include triangles, quadrilaterals, pentagons, hexagons, and cubes. Defining attributes are characteristics that determine whether a shape belongs to a particular category (e.g., number of sides, angles, vertices, etc.). Non defining attributes are characteristic that do not change a shape's classification (e.g., size, orientation, color, etc.).

Instruction should provide opportunities for students to recognize and draw shapes that have specified attributes such as a particular number of sides, vertices, faces, etc., as appropriate to the shape. Students may be supported through the use of physical models, drawings, manipulatives, or examples from their surroundings.

Proficiency in this standard helps develop students' overall special reasoning, geometric vocabulary, and classification skills and encourages future success in geometric reasoning concepts such as those related to properties, measurement, relationships, constructions, and proof.

Instructional Examples:

- Teachers may provide students with a collection of two- and three- dimensional shapes in different sizes and orientations. They may invite students to identify these based on specified attributes such as three sides, or six square faces, and name the shapes they recognize.
- Students may play a game where they are paired back-to-back. One student in the pair should be provided with a card depicting a shape, or with a physical example of the shape. Without naming it, the student should describe the defining attributes of the shape to their partner while the partner attempts to draw the shape based on the provided description. Students can then turn and compare the drawing with the original shape and identify it by name. Partners can debrief about the process, particularly, whether defining attributes were accurately communicated, and refine their plan before switching roles and repeating with a new shape.
- The teacher may invite students to find examples of geometric shapes in their school or community, such as triangles in roof supports or rectangles in windows. They may identify shapes by defining attributes and draw examples of the shapes they recognize.

IEFA Integration Example: Historical and Cultural Dwellings

Context and Connection:

Indigenous Peoples across North America have lived in diverse types of dwellings at different points in their history. Each type of dwelling is shaped by the land, climate, and ways of life of the community. While traditional structures such as tipis, wigwams, longhouses, and earth lodges can be commonly associated with Native cultures, like other citizens of the modern age, Indigenous Americans live in contemporary homes. While no longer the primary form of housing used today, certain structures, like the tipi, remain important cultural symbols that can be used in artwork, modern architecture, and for practices related to culture preservation or celebration.

Many Plains Tribes in Montana, including the Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne), A'aninin (Gros Ventre), Apsáalooke (Crow), Niitsitapi/Amskapi Pikuni (Blackfeet), and Nakoda/Nakona (Assiniboine), used tipis. However, these were not the only structures used. Other forms of shelter such as earth lodges and lean-tos reflect the diversity of environments and ways of living across Indigenous communities of Montana. Different structures were used depending on factors such as season, mobility, available materials, and community needs.

Exploration of these dwellings, and the shapes present in their construction, can provide an opportunity for students to recognize and draw geometric shapes while developing an understanding of how design is connected to location, culture, and practice. The accompanying Historical and Cultural Dwellings Guide identifies selected swelling types, Tribal Nations historically associated with their use, and geometric shapes that may be observed in the structures. Teachers may use this guide, along with other resources included under Relevant Resources to select examples for the task. The guide itself is not an exhaustive list of dwellings used by Indigenous Peoples across North America.

Task Description:

Phase 0: Framing the Lesson

To introduce the task, the teacher should provide students with a brief background on the diversity of Indigenous dwellings. They might choose to incorporate children's stories featuring traditional structures such as *Tipi: Home of the Nomadic Buffalo Hunters* by Paul Goble or *Indian Festival, End of Summer,* or *Teepee Making* from the Indian Reading Series. They should emphasize that different tribes across Montana and North America have used a variety of structures at different times in their history and geographic location that have been shaped by the land, climate, materials, and ways of living. These structures are not interchangeable and should not be generalized to all Indigenous communities. They should also clarify that most Indigenous peoples today live in contemporary homes. Traditional structures remain important and continue to appear in cultural practices, artistic expressions, architectural design, and community events. Teachers may choose to connect this activity to local communities or resources to increase relevance.

Phase 1: Observe

Students will rotate through stations, each featuring a single dwelling. If appropriate in the local context, they should work collaboratively in small groups. Using images and brief descriptions of dwellings selected by the teacher from the Historical and Cultural Dwellings Guide and accompanying resource images, students will examine each structure and identify readily visible geometric shapes such as triangles, quadrilaterals, circles, etc. Students should record their observations using a method that supports representation and communication. Examples might include written descriptions in a math journal, drawings, or simple tables. As students work, the teacher should prompt students to justify their thinking with questions such as “How do you know that is a triangle?”, “What makes this shape a quadrilateral?”, or “What attributes of the shape helped you identify it?” During this phase, the focus should remain on shapes that are readily visible.

Phase 2: Explicit Shape Work

The teacher should bring students together to discuss their observations and highlight shapes they commonly identified across structures. Then, the teacher should introduce or revisit the defining attributes of shapes appropriate for Grade 2 students (e.g., triangles, quadrilaterals, pentagons, hexagons, and cubes). Students may be supported in this work by pattern blocks, drawings, physical models, or other tools. Students will then rotate through stations a second time, using the defining attributes to confirm, revise, or add to their initial shape identifications. Teachers may also emphasize that some shapes are directly visible, but others might be seen only from particular vantage points or representations of a structure.

Phase 3: Identify Shapes by Their Attributes

The teacher will display selected dwelling images on a whiteboard, digital display, or at classroom stations. They will challenge students (independently, or within groups) to identify shapes within the images based on specified attributes instead of the shape name. For example, the teacher might ask: “Which dwelling contains a shape with three sides and three vertices?”, “Can you find a shape with four straight sides and four vertices?”, “Where do you see a shape with more than four sides?”, “Can you identify a shape that has six faces?”, etc.

Students should identify the structure that features the shape, the shape within the image, name the shape, and explain their rationale. If cards are laminated, they may use dry-erase markers to trace or draw the shape to make their thinking visible. Teacher note: Some shapes may not be visible from the selected images. Teachers should choose examples that clearly illustrate intended attributes. Students should not be expected to identify shapes that are not supported by pictured structures.

Phase 4: Create

Students will work individually or in pairs to draw or construct a model inspired by one of the structures they observed. They might use materials available in the classroom such as modeling clay, magnetic tiles, paper shapes, popsicle sticks, or other classroom tools. Students might be challenged to incorporate at least two to three different shapes from the following list: triangles, quadrilaterals, pentagons, hexagons, and cubes. They may be prompted to also describe the defining attributes of the two or three shapes they used (such as number of sides, vertices, faces, or edges). As they engage in the design process, students should be encouraged to explain their design choices, which shapes they used, and which dwelling inspired their creation.

To extend, the teacher may connect this activity to a social studies lesson where students explore dwellings in more depth. Some examples of such lessons are listed in the resources section below. They may also engage students in a reflection conversation with prompts such as: “How do these structures show knowledge of materials, weather, or movement?”, “Why might different Tribes choose different structures?”, “What might matter when deciding how to build a home?”, or “How do these structures show how people lived with the land around them?”, etc.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 3, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions, Additive, or Transformation – Without context specific to a specific Tribe or Tribes, this task would achieve the “contributions” level. With context relating to tribally specific practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the “additive” level. Connecting this task to reflection questions about how worldviews, experiences with the land, or making decisions from a cultural lens effect dwelling creation activates a level of depth and engagement for learners that rises to the “transformation” level.

Relevant Resources:

- Stories of the Land – Chapters 2 & 5 – Montana Historical Society
- Housing Collection – Smithsonian, Natural Museum of the American Indian
- Native American Dwellings – Grades 2-3 Lesson Plan (History) – United States Census Bureau
- Grades K-2 Lesson Plan – How Native Americans Lives in the Past and Today – Montana Office of Public Instruction
- Indian Reading Series – Education Northwest
- Historical and Cultural Dwellings Guide – Montana Office of Public Instruction

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** recognize or draw shapes having specified attributes without **intensive support**.
2. **Developing:** The student **can** recognize and draw shapes having specified attributes with **some support**.
3. **Proficient:** The student **can** recognize and draw shapes having specified attributes **with independence and accuracy**.
4. **Mastery:** The student **can** recognize and draw shapes having specified attributes **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.G.2

Partition a rectangle into rows and columns of same-size squares and find the total number.

General Notes:

Students use their previous familiarity with shapes, equal parts, and spatial organization to learn to partition, or split, a rectangle into equal-sized squares, and to determine the total number of squares present within the rectangle.

Instruction can engage concrete and pictorial support such as square tiles, magnetic tiles, grid paper, geoboards, and drawings to help students visualize and construct these arrangements. Students may use a variety of counting strategies, including, but not limited to counting by ones, skip counting, or repeated addition, to determine the total. There should be some emphasis on maintaining equal sized squares arranged in complete rows and columns without gaps or overlaps.

When students become proficient in rectangular partitions of this kind, they begin to lay a foundation for multiplication, fractional reasoning, arrays, and concepts related to area and measurement.

Instructional Examples:

- The teacher may provide students with square tiles or magnetic tiles and a rectangular outline. Students should fill the rectangle with equal sized squares arranged in rows and columns and determine the total number using a strategy of their choice. As an extension, students may take the activity outdoors and use sidewalk chalk to draw or partition larger rectangles into equal sized shares.
- Students may be provided with rectangles of different sizes drawn on plain paper. They may also receive grid paper they can use to cut out equal sized squares. Students may then use the squares to fill their rectangles, determine the total number of squares, and compare their counting strategies with a partner or small group.
- The teacher may invite students to design a rectangular garden and divide the garden space into equally sized square planting spaces. They may use physical or pictorial representations to create rows and columns of planting spaces and determine the total number of spaces available in the garden.

IEFA Integration Example: Ledger Art

Context and Connection:

Throughout their history, Indigenous Peoples of the Plains have recorded important events, told stories, and expressed cultural identities through artwork. Historically, these records were created on materials such as bison hides. However, as colonization disrupted traditional ways of life and resources became scarce, artists adapted by using materials that became increasingly available, such as paper from counting ledgers. From this shift rose a new form of artistic expression called ledger art. The birth of this medium serves as an example of how Indigenous communities adapted to

preserve and express their histories and perspectives (Montana Historical Society, 2018). Ledger art continues to be practiced today as a cultural and contemporary artistic style. Artists use this medium to share personal experiences, honor traditions, and communicate stories through visual imagery.

The following task has been adapted from the "Native American Ledger Art" activity designed by the Smithsonian Institute.

Task Description:

To introduce the task, the educator will begin by asking students how they share stories with their friends, families, or communities. The teacher will then provide a brief introduction to ledger art and its place in storytelling. They might do this by showing images or short videos featuring artist such as recordings of Niitsitapi/Amskapi Pikuni (Blackfeet) artists John Isaiah Pepion or Terrance Guardipee. As students examine these examples, the teacher should explicitly prompt them to notice how the artwork is created on rectangular paper and consider how the space might be organized. Prompts might include: "How many rows or sections do you see?", "Are the spaces the same size?", "How might the artist have used the space to tell a story?", etc.

Students will then be asked to consider a story they would like to tell, ideally something meaningful that they believe is worth remembering. They should also consider what images, symbols, and colors they could use to represent that story or event. The teacher can then transition to the task by explaining to students "We are going to create artwork inspired by ledger art. As we do this, we will organize our paper into equal rows and columns to help us plan and represent our ideas."

Students will receive a piece of paper and will begin partitioning it into rows and columns to create equally sized squares to help plan and organize their artwork. Teachers can make this more accessible by modeling folding strategies, providing square tiles as guides, or using partially partitioned paper.

Before beginning their artwork, students should determine how many total squares they have created. The teacher can prompt students to think about how many rows there are, how many squares are in each row, how they can find the total number of partitions, and so on. Students should be encouraged to represent and justify their thinking, perhaps using strategies such as repeated addition, counting by rows, drawing, or other strategies. They could also compare their totals across groups or class.

Following their calculations and comparisons, students will create their artwork within the grid they formed, Teachers may support this process by providing traceable images from magazines or printed resources or encourage students to freehand their designs. After they have finished drawing, students can engage in discourse and reflection. Facilitated prompts might include: "How did the grid help you organize your artwork?", "Did the rows and columns make it easier or harder to plan your design?", "What story does your artwork tell?", "Why is it important to tell and remember stories?", "How did your artwork help you share your story with others?", "How can sharing stories help people understand each other or learn about a community?", etc.

As an extension, student artwork and accompanying stories could be displayed as a gallery exhibit in the school, local museum, or community space. Schools may also interview students about their art and share these interviews, as appropriate, in their school, community, or with families.

Alternatively, this context could also connect with the concepts of resourcefulness and reusing. Students could discuss how Indigenous ledger artists adapted available resources to continue expressing their stories, histories, and experiences. Students may consider questions such as: "How did artists make use of the materials available to them? And "How do we reuse or repurpose materials in our own lives?" Teachers may also invite students to create artwork using clean, previously used paper collected from classrooms or other school spaces (e.g., music sheets, scrap paper, flyers, etc.).

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 2, EU 3, EU 5, EU 6, EU 7.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Transformation or Social Action – Connecting this task to reflections about the importance artwork as a tool for communicating stories, traditions, histories, or connection, can activate a level of depth and engagement for learners that rises to the "transformation" level. Displaying student artwork in a public location, creating art to communicate about the community or local culture, or connecting stories to world or community issues could activate a level of depth and engagement for learners that rises to the "social action" level.

Relevant Resources:

- Native Ledger Art: Past and Present – Danforth Museum of Art
- The Art of Storytelling: Plains Indian Perspectives – Montana Historical Society
- Indigenous Beauty: Terrance Guardipee – Seattle Art Museum
- John Isaiah Pepion: Native American Ledger Artist – The Montana Experience
- Native American Ledger Art Video and images for activity – The Smithsonian

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** partition a rectangle into rows and columns of same-size squares or find the total number without **intensive support**.
2. **Developing:** The student **can** partition a rectangle into rows and columns of same-size squares and find the total number with **some support**.
3. **Proficient:** The student **can** partition a rectangle into rows and columns of same-size squares and find the total number **with independence and accuracy**.

4. **Mastery:** The student **can** partition a rectangle into rows and columns of same-size squares and find the total number **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

MT.2.G.3

Partition circles and rectangles into equal shares, recognize that equal shares need not have the same shape, and express the shares in two-halves, three-thirds, and four-fourths.

General Notes:

This standard advances students' previous experiences with dividing shapes into equal parts by extending their comprehension of equal shares to circles and rectangles. It also introduces early fractional vocabulary through the expression of shares as two-halves, three-thirds, and four-fourths. Students must recognize that equal shares of the same whole must represent equal amounts of the whole, even when these shares do not have the same shape.

Instruction may be supported by concrete and pictorial representations such as fraction circles, paper strops, pattern blocks, folded paper, transparent grid overlays, etc. These tools can help students investigate whether shares are equal and recognize that different partitions can produce equal shares of different shapes. A common misconception occurs when students attempt to transfer familiar horizontal or vertical partitioning strategies from rectangles to circles without considering whether the resulting shares are equal. Teachers can address this by presenting both equal and unequal partitions and inviting students to check work through strategies like folding, superimposing pieces, or informally comparing areas.

When students develop proficiency in this standard, they establish a foundation of later concepts such as unit fractions, fraction equivalence, fraction operations, and reasoning about area.

Instructional Examples:

- Students may be presented with images of pizzas or cakes partitioned into equal and unequal shares. The teacher may ask, "Which of these shows equal shares?" and "Would you rather have this piece or that piece? Why?" Student observations should be used to discuss fairness, equal amounts, and engage vocabulary related to halves, thirds, and fourths.
- The teacher may provide students with equal amounts of modeling clay or salt dough. Students can create circles or rectangles, then partition these into two, three or four equal shares. Students should be invited to identify the shares and consider whether equal shares have the same shape. They may also compare their results with classmates.

- Students may be provided with paper circles and rectangles. Students can fold these shapes to create two, three, or four equal shares, then unfold and trace the partition lines. Students should compare different ways of partitioning the same shape and identify the resulting halves, thirds, or fourths.

IEFA Integration Example: Fry Bread

Context and Connection:

Once flour was introduced to Indigenous Peoples through trade and commodities, breads were cooked on coals or ovens. Wheel Bread, Bannock, Frybread, and Pan Bread are all examples of flat, round breads that emerged within the last 150 years. There are unique recipes that have been shared among families and communities for generations. Wheel, Bannock, Pan, and Frybreads are widely regarded as a symbol of resilience and the ability of Indigenous Peoples to adapt to challenging situations. In the face of systemic injustices and the colonization of Indigenous diets, Native communities and individuals were able to take limited ingredients and transform them into a cultural staple that many enjoy to this day. Students from Indigenous and non-indigenous cultures may be able to relate to this task, considering that many global cultures have unique recipes that involve frying dough in disc shapes – from Mesoamerican tortillas to German roll kuchen and beyond.

Task Description:

The teacher will share a brief history of Indigenous breads common to Montana such as Wheel, Bannock, Pan or Frybread. They might read the book *Fry Bread* by Kevin Noble Millard and illustrated by Juana Martinez-Neal, ask a community member or Knowledge Keeper to share their experiences, or share images of different types of breads. As students engage with these resources, the teacher should prompt students to observe and discuss attributes such as shape, size, similarities, or differences across examples. As an optional enrichment, the teacher might provide opportunities for students to see, touch, or taste one or more of these breads to deepen their understanding and engagement.

The teacher will then introduce the task by posing a scenario such as: “Imagine you have a piece of frybread and want to share it fairly with a friend. How could you divide it, so each person gets an equal share?”

Students will work in pairs and receive a circular model representing fry bread. They should have access to a variety of tools such as scissors, rulers, grid overlays, pattern blocks, and other classroom materials to support their thinking. Students will determine how to partition the circle into two equal shares (halves) and explain how they know their shares are equal.

The teacher can circulate among groups and support students with various prompts such as: “How can you check that both parts are the same amount?”, “What could you do to prove your pieces are equal?”, etc. Once students have completed this task, the teacher can bring the class together, asking students to share their approaches. The teacher should lead a discussion where students can compare strategies and representations, paying attention to whether the shares were equal, and how the students justified their reasoning.

To explicitly explore the idea that equal shares need not have the same shape, the teacher may present a circular bread model divided into equal area portions of different shapes (for example, a circle and doughnut shape with equal-area proportions). They may invite students to consider “Which piece would you rather have? Why?”, “Do these pieces represent equal amounts of bread?”, and “How could we prove weather these are equal shares?” Students may use grid overlays, tracing paper, or cut and rearrange strategies to investigate and justify their thinking.

Students will then repeat the earlier process by partitioning new circles into three equal shares (thirds). The teacher might consider forming new groups, this time of three students, to further illustrate the connection to context. Again, students will engage in processes that involve representing and justifying their thinking. The teacher will bring students back together for a discussion that includes comparison of strategies, reasoning, and shape use.

Students will repeat the process one final time by partitioning new circles into four equal shares (fourths), perhaps in new groups of four students, or in pairs and encouraging discourse, reasoning, and representation.

Following the task, the teacher might demonstrate with tools such as circle fraction pieces or overlay strategies to drive the reasoning home, summarizing concepts learned during the lesson such as the vocabulary “two-halves, three-thirds, and four-fourths”, that equal shares need not have the same shape, and that equal shares must represent the same portion of the shape.

Throughout the task, students should express their thinking through drawings, labeling and verbal explanations. Comparison of methods should be encouraged heavily.

To close, students should reflect on both the mathematics and context through prompts such as: “How do you know your shares were equal?”, “Did everyone divide their bread in the same way?”, “Can equal shares have different shapes?”, “Why is it important to share things fairly?”, “What other objects could we divide into equal parts? Why would that be important”, etc.

Possible extensions include collaborating with high school Family and Consumer Science or science classrooms, school food service staff, or a community member to demonstrate how frybread is made or provide samples for students to enjoy.

Essential Understandings:

The following Essential Understandings have potential to be engaged during the task, dependent upon local application and integration of resources:

EU 1, EU 2, EU 3, EU 5.

Multicultural Approach:

The following Multicultural Approach(es) are likely to be engaged during the task, dependent upon local application and integration of resources:

Contributions or Additive– This task rises to the contributions level through its engagement of the context of frybread as an application of learning. With context relating to tribally specific practices, recipes, or a comparison of breads, added to the learning, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level.

Relevant Resources:

- Children's Story - *Fry Bread by Maillard & Martinez-Neal*
- Traditional Foods in Montana School Meals – No Montana Kid Hungry
- Indian Frybread History – Crazy Crow Trading Post
- Frybread: A look at the history of a popular Montana fair food

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** partition circles or rectangles into equal shares, recognize that equal shares need not have the same shape, or express the shares in two-halves, three-thirds, and four-fourths without **intensive support**.
2. **Developing:** The student **can** partition circles and rectangles into equal shares, recognize that equal shares need not have the same shape, and express the shares in two-halves, three-thirds, and four-fourths with **some support**.
3. **Proficient:** The student **can** partition circles and rectangles into equal shares, recognize that equal shares need not have the same shape, and express the shares in two-halves, three-thirds, and four-fourths **with independence and accuracy**.
4. **Mastery:** The student **can** partition circles and rectangles into equal shares, recognize that equal shares need not have the same shape, and express the shares in two-halves, three-thirds, and four-fourths **with independence and accuracy**. The student demonstrates an **advanced** understanding by being able to employ this skill in combination with other standards or by exceeding the developmental expectations.

Appendix A: Correlation with Common Core State Standards

An Important Note:

The Montana State Standards are distinct from the Common Core State Standards (CCSS). This correspondence information is provided as a reference tool to help educators understand the changes and similarities between the two sets of standards. It is important to note that this does not imply equivalence between the standards; rather, it is intended to support educators in evaluating their curriculum and mapping the Montana Standards to their instructional materials.

Many available curriculum resources are aligned to CCSS, and understanding where overlaps exist can assist educators in identifying areas of alignment or divergence. However, educators should assess each Montana State Standard individually for its specific requirements and application in curriculum and instructional materials. This includes analyzing how well the materials align with the intent and scope of the Montana Standards.

In some cases, teaching solely to the corresponding CCSS may not fully address the Montana Standard, particularly for standards that reference Montana's Indigenous Peoples and local communities. Conversely, certain CCSS may extend beyond the scope of the Montana Standards, necessitating careful consideration to avoid teaching content that exceeds what is developmentally or contextually appropriate for the Montana Standards.

This appendix is designed as a tool to support educators in navigating these distinctions and ensuring that their curriculum and instruction meet the expectations of the Montana State Standards.

Correspondence of Mathematical Practice Standards with Common Core Standards

Montana Standard Code	Correlated Common Core Standard(s)
MT.MP.1	CCSS.MP.1
MT.MP.2	CCSS.MP.2, CCSS.MP.7, CCSS.MP.8
MT.MP.3	CCSS.MP.3, CCSS.MP.6
MT.MP.4	CCSS.MP.4
MT.MP.5	CCSS.MP.5
MT.MP.6	**No Corresponding Standard**
MT.MP.7	**No Corresponding Standard**

Correspondence of Grade 2 Content Standards with Common Core Standards

Montana Standard Code	Corresponding Common Core Standard(s)
MT.2.OA.1	CCSS.2.OA.A.1
MT.2.OA.2	CCSS.2.OA.B.2
MT.2.OA.3	CCSS.2.OA.C.3
MT.2.OA.4	CCSS.2.OA.C.4
MT.2.NBT.1	CCSS.2.NBT.A.1
MT.2.NBT.2	CCSS.2.NBT.A.2
MT.2.NBT.3	CCSS.2.NBT.A.3
MT.2.NBT.4	CCSS.2.NBT.A.4
MT.2.NBT.5	CCSS.2.NBT.B.5
MT.2.NBT.6	CCSS.2.NBT.B.6
MT.2.NBT.7	CCSS.2.NBT.B.7
MT.2.NBT.8	CCSS.2.NBT.B.8
MT.2.NBT.9	CCSS.2.NBT.B.9
MT.2.MD.1	CCSS.2.MD.A.1
MT.2.MD.2	CCSS.2.MD.A.2
MT.2.MD.3	CCSS.2.MD.A.3
MT.2.MD.4	CCSS.2.MD.A.4
MT.2.MD.5	CCSS.2.MD.B.5
MT.2.MD.6	CCSS.2.MD.B.6
MT.2.MD.7	CCSS.2.MD.C.7
MT.2.MD.8	CCSS.2.MD.C.8
MT.2.MD.9	CCSS.2.MD.C.9
MT.2.MD.10	CCSS.2.MD.C.10
MT.2.MD.11	**No corresponding standard**
MT.2.G.1	CCSS.2.G.A.1
MT.2.G.2	CCSS.2.G.A.2
MT.2.G.3	CCSS.2.G.A.3

Appendix B: Addressing Financial Literacy in the Grade 2 Math Standards

Introduction

There is no single definition of financial literacy, as the concept requires personal connectivity and relevance. However, most agree that financial literacy is the knowledge of how to make smart decisions about your financial resources to achieve financial stability over a lifetime (OPI, 2024).

In 2023, Montana adopted statute 10.55.905, which mandates that students graduate from high school with a ½ credit in economics or personal finance. This requirement allows flexibility, as the course can be integrated into certain subject area curriculum, including mathematics.

Although this requirement targets graduating seniors, introducing financial literacy concepts at all grade levels can significantly enhance students' awareness and understanding of finances. According to the Federal Deposit Insurance Corporation (FDIC), “teaching kids about money early on will help them become more financially independent as they get older. Financial education has been linked to lower debt levels, higher savings, and higher credit scores as children mature into adulthood” (FDIC, 2020).

Research shows that children are capable of learning about financial literacy at young ages and are significantly impacted by observing the financial behaviors of the adults in their lives, influencing their economic behaviors throughout childhood and adulthood (Center for Financial Security, University of Wisconsin-Madison, 2012). This is supported by the findings of a study conducted by Grinstein-Weiss et al. (2009) which uncovered a significant correlation between parental teaching of money management and higher future credit scores. Furthermore, the financial literacy levels of students are closely linked to personal factors, such as socioeconomic background (Sherraden et al., 2011; Mandell, 2009). Schools therefore present a critical opportunity to help overcome these barriers and improve the financial literacy of all students.

While research on in-school financial education programs generally shows positive outcomes, much of the existing work has been conducted in small-scale studies. There is a growing need for further research to understand the long-term impact of embedding financial literacy concepts into elementary mathematics instruction and how it shapes students' economic behaviors over time.

This appendix aims to provide clarity regarding which Montana Mathematics Content Standards for Grade 2 address financial literacy themes. For further guidance on financial literacy and its integration across other content areas beyond mathematics, please visit the Career and Technical Education page on the Office of Public Instruction website.

Financial Literacy Themes:

The State of Montana has adopted six themes of Economic and Financial Literacy Instruction based on the National Standards for Personal Finance Education (2021). These themes will be referenced throughout this appendix.

Summary of Themes of Economic and Financial Literacy Instruction

Theme	Summary
I. Earning Income	Most people earn wage and salary income in return for work, and they can also earn income from interest, dividends, rents, entrepreneurship, business profits, or increases in the value of investments. Employee compensation may also include access to employee benefits such as retirement plans and health insurance. Employers generally pay higher wages and salaries to more educated, skilled, and productive workers. The decision to invest in additional education or training can be made by weighing the benefit of increased income-earning and career potential against the opportunity costs in the form of time, effort, and money. Spendable income is lower than gross income due to taxes assessed on income by federal, state, and local governments.
II. Spending	A budget is a plan for allocating a person's spendable income to necessary and desired goods and services. When there is sufficient money in their budget, people may decide to give money to others, save, or invest to achieve future goals. People can often improve their financial well-being by making well-informed spending decisions, which include critical evaluation of price, quality, product information, and method of payment. Individual spending decisions may be influenced by financial constraints, personal preferences, unique needs, peers, and advertising.
III. Saving	People who have sufficient income can choose to save some of it for future uses such as emergencies or later purchases. Savings decisions depend on individual preferences and circumstances. Funds needed for transactions, bill-paying, or purchases, are commonly held in federally insured checking or savings accounts at financial institutions because these accounts offer easy access to their money and low risk. Interest rates, fees, and other account features vary by type of account and among financial institutions, with higher rates resulting in greater compound interest earned by savers.
IV. Investing	People can choose to invest some of their money in financial assets to achieve long-term financial goals, such as buying a house, funding future education, or securing retirement income. Investors receive a return on their investment in the form of income and/or growth in value of their investment over time. People can more easily achieve their financial goals by investing steadily over many years, reinvesting dividends, and capital gains to compound their returns. Investors have many choices of investments that differ in expected rates of return and risk. Riskier investments tend to earn higher long-run rates of return than lower risk investments. Investors select investments that are consistent with their risk tolerance, and they diversify across a number of different investment choices to reduce investment risk.
V. Managing Credit	Credit allows people to purchase and enjoy goods and services today while agreeing to pay for them in the future, usually with interest. There are many choices for borrowing money, and lenders charge higher interest and fees for riskier loans or riskier borrowers. Lenders evaluate the creditworthiness of a borrower based on the type of credit, past credit history, and expected ability to repay the loan in the future. Credit reports compile information on a person's credit history, and lenders use credit scores to assess a potential borrower's creditworthiness. A low credit score can result in a lender denying credit to someone they perceive as having a low level of creditworthiness. Common types of credit include credit cards, auto loans, home mortgage loans, and student loans. The cost of post-secondary education can be financed through a combination of grants, scholarships, work-study, savings, and federal or private student loans.

VI. Managing Risk	People are exposed to personal risks that can result in lost income, assets, health, life, or identity. They can choose to manage those risks by accepting, reducing, or transferring them to others. When people transfer risk by buying insurance, they pay money now in return for the insurer covering some or all financial losses that may occur in the future. Common types of insurance include health insurance, life insurance, and homeowner's or renter's insurance. The cost of insurance is related to the size of the potential loss, the likelihood that the loss event will happen, and the risk characteristics of the asset or person being insured. Identity theft is a growing concern for consumers and businesses. Stolen personal information can result in financial losses and fraudulent credit charges. The risk of identity theft can be minimized by carefully guarding personal financial information.

Content Standards that Explicitly Address Financial Literacy:

The Grade 2 Mathematics Content Standards contain one standard that specifically addresses financial literacy themes:

MT.2.MD.8: Solve problems in context involving dollar bills, quarters, dimes, nickels, and pennies using $ and ¢ symbols appropriately.

- This standard explicitly addresses financial literacy and foundational knowledge.
- There are developmentally appropriate contextual examples within the themes of (I) Earning Income, (II) Spending, and (III) Saving such as: *Provide students with contextual problems involving currency that requires students to use the correct unit symbols of $ and ¢ . For example, "You are raking leaves in your community to fundraise for your local senior center. One neighbor makes a fifteen-dollar donation, and another donates ten dollars and two quarters. How much did you raise from raking leaves at the two houses?" ($25 and 50¢*, or $25.50) *Discuss how money can be earned, used to buy goods or saved for future purchases.*

Content Standards that Could Address Financial Literacy Through Problems in Context:

There are additional Grade 2 Mathematics Content Standards that may address financial literacy themes through specific instruction using problems in context.

These standards have the potential to address financial literacy themes when applied within problems in context. Incorporating context into the instructional delivery of a standard is an effective way to help students meaningfully connect to the content, drawing on their culture and lived experiences.

However, adding context to a standard in a way that exceeds its expectations in assessment can elevate an assessment question to Level 4: Highly Proficient or Mastery on a proficiency scale or rubric. Educators should be mindful of this distinction when designing assessments to ensure alignment with the intended standard.

The Montana grade 2 Content Standards that may address financial literacy through problems in context are:

MT.2.OA.1	MT.2.OA.4	MT.2.NBT.3	MT.2.NBT.6	MT.2.MD.10
MT.2.OA.2	MT.2.NBT.1	MT.2.NBT.4	MT.2.NBT.7	MT.2.MD.11
MT.2.OA.3	MT.2.NBT.2	MT.2.NBT.5	MT.2.NBT.8	

Appendix C: 1 – 3 Vertical Alignment

Introduction:

Mathematical concepts build progressively as students advance through their PK-12 educational experience. Concepts taught in younger grades quickly become fundamental to a student's success in subsequent grades. Understanding vertical alignment of standards provides valuable perspective into a student's progression of understanding and supports mastery at every grade level.

In 2021, EdReports emphasized that teaching redundant content or failing to address grade-level expectations can lead to significant gaps and imbalances in student learning. The inefficient use of instructional time hinders student progress and leads to student frustration and disengagement (Hicks & Potts, 2021). By understanding how content is scaffolded across grades, educators can make informed decisions about what content to review and when to introduce new concepts (Hicks & Potts, 2021).

This appendix aims to support educators in identifying the fundamental mathematical concepts that build a student's grade 2 understanding. It also provides a forward-looking perspective, outlining the progression of skills students will encounter in first grade. Suggested applications of this vertical articulation include:

- **Identifying prior knowledge**: Helping educators pinpoint foundational knowledge students may need to access when introducing new grade 2 concepts.
- **Supporting differentiation for struggling students:** Assisting educators in identifying and assessing prior-grade standards to address gaps in understanding for students progressing from "emerging" or "developing" to "proficient."
- **Supporting differentiation for highly proficient students:** Enabling educators to identify subsequent grade-level expectations, allowing advanced students to progress beyond the grade 2 standard when appropriate.
- **Facilitating cross-grade-level collaboration:** Encouraging discussions between educators of different grade levels to align curriculum, improve instructional outcomes, and foster consistency in student learning progressions.

Grade 1 – Grade 2 – Grade 3 Vertical Alignment Overview:

The following table provides an overview of an example of a kindergarten to second grade vertical alignment. Elaborations on these progressions are available as this appendix proceeds. It is worth noting that most mathematical concepts connect to each other and build over time. Therefore, there are multiple ways in which a vertical alignment table like the one provided below, might vary. This document aims to provide some support and guidance to individuals who seek to understand more about how standards connect to others across the grades 1-3 continuum.

Grade 1	Grade 2	Grade 3
MT.1.NBT.1	MT.2.NBT.3, MT.2.NBT.2	Foundational Skill
MT.1.OA.5	MT.2.MD.6	MT.3.NF.2
MT.1.OA.8, MT.1.NBT.3	MT.2.OA.4, MT.2.OA.3, MT.2.NBT.4	MT.3.OA.1, MT.3.NF.3
MT.1.OA.3, MT.1.NBT.2	MT.2.NBT.1	MT.3.NBT.1
MT.1.OA.4, MT.1.OA.9	Foundational Skill	MT.3.OA.6, MT.3.OA.4
MT.1.OA.6, MT.1.OA.7	MT.2.OA.2, MT.2.NBT.5, MT.2.NBT.6, T.2.NBT.7, MT.2.NBT.9	MT.3.NBT.2, MT.3.NBT.3, MT.3.OA.5, T.3.OA.7, MT.3.OA.9
MT.1.OA.1, MT.1.OA.2, MT.1.NBT.4, T.1.NBT.5, MT.1.NBT.6	MT.2.OA.1, MT.2.MD.5, MT.2.MD.11, T.2.NBT.8	MT.3.OA.3, MT.3.OA.8
MT.1.MD.1, MT.1.MD.2	MT.2.MD.1, MT.2.MD.2, MT.2.MD.3, MT.2.MD.4	MT.3.MD.8, MT.3.MD.2
MT.1.MD.5	MT.2.MD.9, MT.2.MD.10	MT.3.MD.3, MT.3.MD.4
MT.1.MD.4	MT.2.MD.8	Foundational Skill
MT.1.MD.3	MT.2.MD.7	MT.3.MD.1
MT.1.G.1, MT.1.G.2, MT.1.G.3	MT.2.G.1	MT.3.G.1
MT.1.G.4	MT.2.G.2, MT.2.G.3	MT.3,MD.5, MT.3.G.2, MT.3.OA.2, MT.3.NF.1

Grade 1 – Grade 2 – Grade 3 Vertical Alignment Elaborations:

Grade 1	Grade 2	Grade 3
MT.1.NBT.1 - Flexibly count, read, write, and represent numbers to 120.	**MT.2.NBT.3** - Flexibly count, read, write, and represent numbers to 1000. **MT.2.NBT.2** - Skip-count by 5s, 10s, and 100s.	Although no specific grade 3 standard is identified, these number sense skills are foundational to place-value reasoning, computational fluency, and numerical relationship understanding across many Grade 3 standards and beyond.

Elaboration:

Understanding related to number sequences and representations is foundational to students' ability to recognize patterns in the base-ten number system and reasoning about numerical relationships. This contributes to more sophisticated place-value reasoning, computation, and multiplicative thinking as students' progress in their mathematics education.

Grade 1	Grade 2	Grade 3
MT.1.OA.5 - Relate counting to addition and subtraction.	**MT.2.MD.6** - Represent whole numbers as lengths from 0 and represent sums and differences within 100 on a number line.	**MT.3.NF.2** – Understand a fraction as a number on a number line by: • Representing a unit fraction on a number line, • Representing a fraction as multiple copies of a unit fraction on a number line, and • Representing fractions on a number line.

Elaboration:

Students extend foundational understandings of addition and subtraction to using number lines as a visual representation of these operations. Once students gain this comprehension, they can extend it to fractions as students reason about equal intervals, distances from zero, and the placement of fractional quantities on number lines.

Grade 1	Grade 2	Grade 3
MT.1.OA.8 - Understand the meaning of the equal sign and determine if equations are true or false. **MT.1.NBT.3** - Compare two two-digit numbers using comparison symbols >, =, and <.	**MT.2.OA.4** - Use addition to find the total number of objects arranged in rectangular arrays. **MT.2.OA.3** - Determine whether a group of objects, up to 20, has an odd or even number of members. **MT.2.NBT.4** - Compare two three-digit numbers using >, =, and < symbols.	**MT.3.OA.1 –** Understand products of whole numbers as the total number found by multiplying a number of groups by the number of objects per group. **MT.3.NF.3 –** Understand the equivalence of fractions in special cases and compare fractions by reasoning about their size by: • Understanding two fractions as equivalent if they are the same size or the same point on a number line, • Recognizing and generating simple equivalent fractions and by demonstrating or justifying why the fractions are equivalent, • Writing whole numbers as fractions, recognizing fractions that are equivalent to whole numbers, and locating them on a number line, • Comparing two fractions with the same numerator or the same denominator by reasoning about their size and recognizing that comparisons are valid only when the two fractions refer to the same whole, and • Recording the results of fraction comparisons with the symbols >,=, < and justifying the conclusions.

Elaboration:

Understanding equality and comparing numbers evolves dramatically from kindergarten to third grade. Students begin by reasoning about relationships related to whole numbers and groups of numbers, comparing two- and three-digit numbers, and eventually comparing fractions and providing a justification of conclusions made about their relative size. Parallel to this progression, students are also developing an understanding of numerical structure through odd and even groupings and rectangular arrays, using repeated addition to determine the total number of objects in equal groupings and laying the foundation for multiplication, which is emphasized heavily in grade three. Fraction comparison and equivalence also build on students' understanding of number lines, connecting to the previous progression provided in this appendix.

Grade 1	Grade 2	Grade 3
MT.1.OA.3 - Flexibly compose and decompose numbers to add and subtract. **MT.1.NBT.2** - Understand that ten is a unit composed of ten ones and that a two-digit number represents tens and ones.	**MT.2.NBT.1** - Understand one hundred is a unit composed of ten tens and that three-digit numbers represent amounts of hundreds, tens, and ones.	**MT.3.NBT.1** – Use place value understanding to round whole numbers to the nearest 10 or 100.

Elaboration:

Students' ability to flexibly compose and decompose numbers is a foundational support to their understanding of the base-ten system. This comprehension of how numbers are composed of units of differing sizes provides the bedrock for reasoning about the relative value of digits and rounding whole numbers to the nearest ten or hundred.

Grade 1	Grade 2	Grade 3
MT.1.OA.4 - Understand subtraction as an unknown-addend problem. **MT.1.OA.9** - Determine the unknown number in an addition or subtraction equation relating to three numbers.	Although no specific grade 2 standard is identified, this strategy serves as a foundational tool across multiple grade 2 standards and is crucial for addition and subtraction problems and early algebraic reasoning in grade 2 and beyond.	**MT.3.OA.6 –** Use division as an unknown factor problem. **MT.3.OA.4 –** Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

Elaboration:

The ability to identify and determine unknown quantities requires students to reason about relationships between numbers and operations. This relational understanding becomes more sophisticated as students apply it to Grade 2 algebraic reasoning, and even more so, when students are asked to apply this reasoning to the problems involving multiplication and division in Grade 3.

Grade 1	Grade 2	Grade 3
MT.1.OA.6 - Flexibly, accurately, and efficiently add and subtract within 10. **MT.1.OA.7** - Use multiple strategies to add and subtract within 20.	**MT.2.OA.2** - Flexibly, accurately, and efficiently add and subtract within 20 using mental strategies. **MT.2.NBT.5** - Flexibly, accurately, and efficiently add and subtract within 100 using multiple strategies. **MT.2.NBT.6** - Add up to four two-digit numbers using multiple strategies. **MT.2.NBT.7** - Add and subtract within 1000 using multiple strategies. **MT.2.NBT.9** - Understand and make connections between different strategies for addition and subtraction.	**MT.3.NBT.2 –** Flexibly, accurately, and efficiently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **MT.3.NBT.3 –** Multiply one-digit whole numbers by multiples of 10 in the range 10-90 using strategies based on place value and properties of operations. **MT.3.OA.5 –** Apply the commutative property of multiplication, associative property of multiplication, and distributive property of multiplication over addition on whole numbers as strategies to multiply. **MT.3.OA.7 –** Flexibly, accurately, and efficiently multiply and divide within 100, using strategies such as the relationship between multiplication and division. **MT.3.OA.9 –** Identify arithmetic patterns and explain them using properties of operations.

Elaboration:

Across these standards, students are developing computational fluency as they build increasingly flexible, accurate, and efficient strategies for evaluating and reasoning. Across the progression, students are asked to select, apply, and often reason about their strategies while working with increasingly complex numbers and extending their reasoning from addition and subtraction to multiplication and division. Developing proficiency with these concepts and strategies also supports students' ability to recognize, explain, and generalize patterns and relationships across operations, as expected beginning in third grade.

Grade 1	Grade 2	Grade 3
MT.1.OA.1 - Use addition and subtraction within 20 to solve of all types. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. **MT.1.OA.2** - Solve problems in context that call for addition of three whole numbers with a sum less than or equal to 20 in context of all types. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. **MT.1.NBT.4** - Build a foundation for addition within 100 by: Adding two-digit to one-digit numbers, and Adding multiples of 10 to two-digit numbers. **MT.1.NBT.5** - Using place value, given a two-digit number, find 10 more or 10 less than the number. **MT.1.NBT.6** - Subtract multiples of 10 from a two-digit number.	**MT.2.OA.1** - Use addition and subtraction within 100 to solve one- and two-step problems in context involving all problem types. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. **MT.2.MD.5** - Use addition and subtraction within 100 to solve problems in context involving lengths that are given in the same units. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. **MT.2.MD.11** - Solve addition and subtraction problems of all types using data presented. **MT.2.NBT.8** - Using place value, add or subtract 10 or 100 from a given number.	**MT.3.OA.3 –** Use multiplication and division within 100 to solve problems in context in situations involving equal groups, arrays, and measurement quantities. **MT.3.OA.8 –** Solve two-step problems in context using the four operations, represent these problems using equations with a letter standing for the unknown quantity and assess the reasonableness of answers using mental computation and estimation strategies. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

Elaboration:

Across these standards, students are asked to apply their understanding operations and numerical relationships to make sense of and solve problems in varying contexts and applications. As this understanding evolves, the operations, quantities, and situations become increasingly complex. Eventually, students are asked to interpret relationships between quantities with respect to the context, select appropriate operations and representations, and reason about the meaning and reasonableness of solutions.

Grade 1	Grade 2	Grade 3
MT.1.MD.1 - Order three objects by length and compare the lengths of two objects indirectly by using a third object. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. **MT.1.MD.2** - Express the length of an object as a whole number of length units. Understand that the measurement of an object is the number of same-size length units that span it with no gaps or overlaps.	**MT.2.MD.1-** Measure the length of an object by selecting and using appropriate tools. **MT.2.MD.2**- Understand the relationship between unit sizes and number of units by measuring a single object using two different units of common measurement. **MT.2.MD.3** - Estimate lengths using units of common measurement. **MT.2.MD.4** - Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	**MT.3.MD.2 –** Measure and estimate liquid volumes and masses of objects using customary and metric units by adding, subtracting, multiplying, and dividing to solve one-step problems in context that involve masses or volumes that are given in the same units. **MT.3.MD.8** – Solve problems in context involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Elaboration:

Students develop measurement reasoning across these standards as they start by comparing lengths and progress to measuring and estimating quantities using standard units and tools. Understanding the relationship between the size of a measurement unit and the number of units required to describe a quantity provides a foundation for measurement of attributes that include length, mass, and liquid volume. As their understanding becomes more sophisticated, students apply these concepts to problems in context including those that involve perimeter.

Grade 1	Grade 2	Grade 3
MT.1.MD.5 - Organize, represent, and interpret data with up to three categories by: asking and answering questions about the total number of data points, identifying how many are in each category, and analyzing differences between categories.	**MT.2.MD.9** - Generate measurement data and present the data in multiple ways. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. **MT.2.MD.10** - Organize, represent, and interpret data with up to four categories. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.	**MT.3.MD.4 –** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch and show the data by making a line plot where the horizontal scale is marked off in appropriate units. **MT.3.MD.3** – Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

Elaboration:

These standards contribute to students' data literacy as they collect, organize, represent, and interpret data in contexts with meaning. As this understanding develops, the data sets and representations become more complex. These experiences strengthen students' ability to interpret and compare quantities, identify relationships, and use mathematical reasoning to answer questions about contextual situations relevant to their communities and Montana's Indigenous Peoples using data.

Grade 1	Grade 2	Grade 3
MT.1.MD.4 - Identify the value of coins.	**MT.2.MD.8** - Solve problems in context involving dollar bills, quarters, dimes, nickels, and pennies using $ and ¢ symbols appropriately.	Although no specific Grade 3 standard is identified, this standard serves as a foundational tool across multiple Grade 3 conceptual application standards and is crucial for developing financial literacy in Grade 3 and beyond.

Elaboration:

Across these standards, students begin to develop early financial literacy – specifically counting money and solving problems involving monetary amounts in context. Although no specific Grade 3 standard directly extends this learning, financial literacy provides a relevant context across other standards such as those relating to multiplication, division, and data interpretation.

Grade 1	Grade 2	Grade 3
MT.1.MD.3 - Tell and write time in hours and half-hours using analog and digital clocks.	**MT.2.MD.7** - Tell and write time from analog and digital clocks to the nearest five minutes using a.m. and p.m.	**MT.3.MD.1 –** Tell and write time on an analog and digital clock to the nearest minute and measure time intervals in minutes and solve word problems in context involving addition and subtraction of time intervals in minutes.

Elaboration:

Students' understanding of concepts related to time becomes increasingly precise as they progress through these standards. This understanding of how units of time relate to one another provides a foundation for measuring elapsed time and applying addition and subtraction to solve problems that involve the context of time.

Grade 1	Grade 2	Grade 3
MT.1.G.1 - Distinguish between defining attributes and nondefining attributes. **MT.1.G.2** - Build and draw shapes to possess defining attributes. **MT.1.G.3** - Compose new shapes using two- and three-dimensional shapes.	**MT.2.G.1** - Recognize and draw shapes having specified attributes.	**MT.3.G.1 –** Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Elaboration:

Across these standards, students are expanding their geometric reasoning skills as they recognize, describe, draw, compose and construct shapes based on their attributes. As this understanding continues to develop, students use these to eventually recognize relationships among shapes and classify them into categories. This progression supports sophisticated reasoning about how shapes can share attributes while belonging to multiple geometric categories.

Grade 1	Grade 2	Grade 3
MT.1.G.4 - Partition circles and rectangles into two and four equal shares. Describe the shares using the words: halves, fourths, and quarters.	**MT.2.G.2** - Partition a rectangle into rows and columns of same-size squares and find the total number. **MT.2.G.3** - Partition circles and rectangles into equal shares, recognize that equal shares need not have the same shape, and express the shares in two-halves, three-thirds, and four-fourths.	**MT.3.NF.1 –** Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts and understand a fraction a/b as the quantity formed by a parts of size $1/b$. **MT.3.G.2** – Partition shapes into parts with equal areas; express the area of each part as a unit fraction of the whole. **MT.3.OA.2** – Understand whole-number quotients of whole numbers: • As the number of objects in each group with the total quantity divided equally into a number of shares, and • As the number of shares when a total number of objects is partitioned into equal-sized groups. **MT.3.MD.5** – Recognize area as an attribute of plane figures and understand concepts of area measurement by: • Understanding that a square with side length 1 unit, called "a unit square," is said to have "one square unit" of area and can be used to measure area, and • Understanding that a plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. **MT.3.MD.6** – Measure areas by counting unit squares. **MT.3.MD.7** – Relate area to the operations of multiplication and addition by: • Finding the area of a rectangle with whole-number side lengths by tiling it, and showing that the area is the same as would be found by multiplying the side lengths, • Multiplying side lengths to find areas of rectangles with whole-number side lengths while solving problems in context and representing whole-number products as rectangular areas, • Using tiling and area models to represent the distributive property in finding area of a rectangle with whole-number side lengths a and $b+c$ is the sum of $a \times b$ and $a \times c$, and • Recognizing area as additive, finding areas of straight-line figures by decomposing them into nonoverlapping rectangles and adding the areas of the nonoverlapping parts. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

Elaboration:

In grade 2, students gain deeper understanding of equal partitioning as they divide shapes into shares and organize rectangles into rows and columns of equal-sized shares. Gaining proficiency in understanding the relationships between equal parts and wholes serves as the foundation for fractional reasoning in Grade 3 while organizing and counting equal-sized shares supports the development of area measurement and multiplication. These conceptual understandings also contribute to early reasoning about division through equal sharing and grouping.

Appendix D: Statement of Gratitude

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