MONTANA GRADE 1 MATHEMATICS STANDARDS EXPANDED GUIDANCE

MONTANA OFFICE OF PUBLIC INSTRUCTION (OPI)

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TABLE OF CONTENTS

TABLE OF CONTENTS 1

INTRODUCTION TO THE MONTANA GRADE 1 MATHEMATICAL PRACTICE AND CONTENT STANDARDS 2

MONTANA K-12 MATHEMATICAL PRACTICE STANDARDS 7

GRADE 1 MATHEMATICS CONTENT STANDARDS – OVERVIEW 36

GRADE 1 EXAMPLES AND ELABORATIONS BY STANDARD 38

APPENDIX A: CORRELATION WITH COMMON CORE STATE STANDARDS 124

APPENDIX B: ADDRESSING FINANCIAL LITERACY IN THE GRADE 1 MATH STANDARDS 126

APPENDIX C: K – 2 VERTICAL ALIGNMENT 130

APPENDIX X: REFERENCES 148

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INTRODUCTION TO THE MONTANA GRADE 1 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 1 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 1 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 1. This **grade 1-specific** guidance document aims to:

- Clarify the purpose and goals of the Montana Standards for grade 1 mathematics.
- Provide an overview of the standards for educators, families, students, and others invested in grade 1 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 1 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 1 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 (REL Southeast, 2020). Montana's mathematics content standards begin with kindergarten and continue through twelfth grade, providing a clear progression of learning that builds a strong foundation in mathematical concepts and procedures.

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 the 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 the Grade 1 Standards

All grade 1 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.

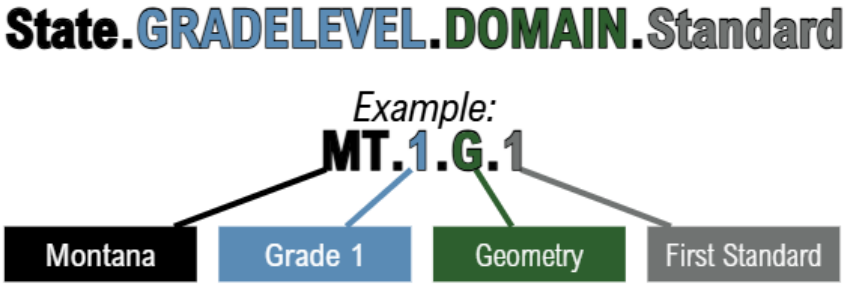
2. **Grade Level: 1**
   This element identifies the grade level of the standard:
   - Grade 1 is indicated by **"1"**

3. **Domain: Abbreviated Representation**
   Each standard is categorized within a domain, represented by a short abbreviation. A **domain** within the grade 1 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 the grade 1 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 1 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 1 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 outcomes 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 society becoming increasingly reliant on data and mathematics, offering a clearer vision of the skills students need to understand and apply mathematics in relevant contexts (NAGB, 2021). 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 1, 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 1 Applications:

Grade 1 students can begin to develop their problem-solving skills by engaging in activities and tasks that allow them to explore and discover strategies that work for themselves. These activities are often supported by a myriad of tools and resources, like manipulatives, patterns, comparisons, and representations (e.g., pictures, ten frames, number sentences, etc.). Grade 1 students are encouraged to persist through challenges with teacher support and explore alternative approaches when their initial solutions do not work. In first grade, students are beginning to approach problems with a trial-and-error mindset, are beginning to gain the ability to break down problems into manageable steps and still rely heavily on concrete tools and teacher guidance. They are developing the ability to stay engaged in problem-solving tasks and are often supported by adult modeling, questioning, and encouragement to persist when facing challenges.

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 1** students are provided opportunities to play and explore, engage with problems that have multiple solutions or strategies, and utilize 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 1** students guess or predict outcomes based on observations and are beginning to reason abstractly. For example, they might guess which object is longer by comparing two objects to a third object and drawing a conclusion.

- **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 1** students will be expected to make a plan and follow through with it. For example, they may decide to “count on” to solve a subtraction problem instead of using an alternative strategy, such as writing subtraction as an unknown addend problem.

- **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 1** students can demonstrate understanding by using developmentally appropriate vocabulary to describe why they chose a certain strategy, engaged in certain steps, or knew their answer made sense. For example, students may explain

how they identified an unknown value in a subtraction problem by explaining “I knew that I had six already, and there were ten total. I figured out that it takes four more to get from ten to six.”

- **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 1** 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 1** 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 asked to compose new shapes using two- and three-dimensional shapes, grade one students may create unique constructions from one another, despite having the same materials. Students in **grade 1** may also have opportunities to use a variety of strategies rather than being restricted to a single method. For example, when learning addition and subtraction, they should practice with flexible strategies beyond the traditional algorithm. During problem-solving tasks, students should be encouraged to apply different approaches or be exposed to discussions that highlight the various methods classmates used.

- **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 1**, students can engage in reflection by determining whether their answers align with the context of the problem, assessing the effectiveness of their chosen strategy, and exploring tools or manipulatives that could support their thinking. For example, when composing or decomposing numbers, a student might initially provide an incorrect decomposition. The teacher might guide reflection by asking, “Before, there were 12 total. Do the numbers you have written still equal 12? Does your answer still make sense? Why or why not?”

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 1 Applications:

Grade 1 students begin to abstract and generalize by identifying and describing patterns, relationships, and structures in familiar contexts. These activities help them connect concrete experiences to symbolic representations in developmentally appropriate ways. At this stage, students are focused on observing and describing specific examples of patterns or relationships, often relying on concrete manipulatives or visual aids. They are not yet generalizing broadly or applying abstract reasoning independently. 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.

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 represent contextual information in mathematical ways. Teachers may support this by providing materials, representations, or strategies that help students translate the information they are presented with. For **grade 1** students, this might involve using drawings, tallies, numerals, ten frames, or counters to help understand the meaning of an equal sign and determine whether equations are true or false.

- **Symbolic Representation:** Learning activities involve symbols, numerals, and visual representations of mathematical concepts to support forming connections between abstract and concrete thinking. In **grade 1**, students use visual representations, such as drawing lines, shapes, numeral, and early number sentences to express quantities and relationships. For example, drawing a number sentence such as 3 + 9 = 12 to represent a situation where three students were on the playground and later joined by nine students. Students might also represent the situation with pictorial drawings when trying to evaluate the sum.

- **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. **Grade 1** students work with simple patterns that may appear within number sequences to build numerical understanding, counting fluency, and to support the future development of skip-counting and place-value knowledge.

- **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 1**, students may be asked to work with patterns and structures in shapes (such as noticing all triangles have three sides), the composition and decomposition of numbers (such as 10 can be made from 3 + 7, 6 + 4, etc.), the counting sequence (such as the pattern by tens in the number system), etc.

- **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 1**, 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, generalizing simple addition and subtraction rules (e.g., “when I add ten, the numeral in the tens place goes up one”), or, noticing that shapes have consistent properties (e.g., “triangles always have three sides”).

- **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 1** students may work within simple and developmentally appropriate contexts such as identifying coins that might be used to buy items at a grocery store, adding up numbers of friends who attended a birthday party, or beginning to work with data that represents situations relevant to their communities, to bring meaning to abstract ideas.

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 (e.g. using "plus-ing" instead of "addition") 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 1 Applications:

Grade 1 students begin to justify and prove their ideas by explaining their reasoning and engaging in simple evaluations of mathematical claims using concrete examples and age-appropriate vocabulary. In grade 1, students begin to engage with reasoning but may not yet possess the ability to generalize or justify their thinking at elaborate levels. They are starting to explore patterns and repeated reasoning through specific examples and contexts, but not yet connecting them to overarching concepts, and they are relying on teacher guidance to learn how to provide explanations or correct reasoning. They may begin to explain their thinking using pictures, manipulatives, or concrete contexts. These activities help them build confidence in their thinking and develop skills foundational to reasoning, in ways that are developmentally appropriate.

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 1**, 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 1** students may use simple means to evaluate a claim, such as by using manipulatives, ten frames, or images to confirm thinking. These can also help develop justification skills. For instance, if a student is provided a statement such as “This equation is true,” they then might use counters, or any number of strategies to confirm or deny that the statement is true.

- **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 1** students will use simple language or tools such as drawings or ten frames. For instance, they might say, “I know that six minus two equals four because when I put six counters in the ten frame and takeaway two, four are left.”

- **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 1** students can recognize and explain mistakes, such as correcting a peer who claims ten can be deconstructed as 6 + 3 by providing reasoning. They may also reflect on their own learning, saying, "I thought that adding ten would change the ones place, but it changes the tens place!" At this age, students benefit from learning to disagree respectfully, and to form counter arguments.

- **Concrete Examples:** Tasks involve using manipulatives, drawings, or real-world objects to support students in developing their reasoning. For instance, in **grade 1**, students may be asked to decide differences between data related to a classroom or community context. In this scenario, they will examine the data presented, then likely count the number of points shown in the data and evaluate their claims. The concrete example helps students draw these connections and provide reasoning at the early developmental stages.

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 explanations, 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 them that 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 1 Applications:

Grade 1 students begin to model with mathematics by using objects, drawings, and early data models to represent contextual problems. These activities help students connect their everyday experiences to mathematical ideas in developmentally appropriate ways. At this stage, students rely heavily on physical tools and teacher guidance to explore mathematical concepts. They are learning how to translate situations into simple representations and how to test their models to see if they make sense. Common models and tools used in grade 1 include, but are not limited to, hundreds charts, bar models, tape diagrams, base ten blocks, place value charts, number lines, etc.

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 a person is using ingredients in cooking, **grade 1** students might be able to represent the situation as a subtraction problem to determine how many more items need to be added to the mixture.

- **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 1**, students use familiar contexts such as sharing snacks or connecting time on a clock to activities they engage in daily.

- **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, or other resources to help students make sense of scenarios visually, physically, verbally, symbolically, and contextually. In **grade 1**, students might be presented with a scenario such as “I went to the store yesterday and there were fifteen pumpkins on display. I bought two. How could we figure out how many I left?” Students might suggest different strategies, draw pictures, write equations with unknowns, or use any number of strategies to make sense of the situation.

- **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 1** students might recount 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 1** 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 counting how many donations they will need to collect, 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 1**, this may look like offering a play-based or story-driven activity that allows for varying levels of engagement and solving approaches, for instance, "What other shapes could we make out of four triangles and two squares?" or "How could we quickly count the number of dots shown in this image?"

- **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 1** students may be provided with tools such as ten frames or number lines to encourage them to try challenging problems, rather than quit or wait for a hint or support from the teacher.

- **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 1** students may be exposed to play-, art-, exploration-, or story-based activities that promote their natural curiosity and creative spirit, fostering a solid foundation of appreciation for and comfort with mathematical principles (NCTM, 2005; Parlakian (NAEYC), 2022).

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 1 Applications:

Grade 1 students begin to recognize and create representations of mathematical ideas using physical objects, drawings, contextual applications, and simple symbolic or verbal statements. At this stage, they focus on understanding how to use these representations to communicate their thinking and solve problems. They also start to explore how multiple representations (e.g., visual, symbolic, verbal, contextual, and physical) can show the same mathematical idea and how these representations relate to one another. Grade 1 activities should emphasize concrete, pictorial, and symbolic representations, as these form the foundation for higher-level, more abstract thinking. Physical tools such as counters, cubes, ten frames, base-ten blocks, number lines, dominoes, beads on a string, tangrams, fingers, and playdough help students explore math concepts in hands-on ways. Visual representations, such as tally marks, circles, simple graphs, and part-part-whole models, bar models, tape diagrams, and place value charts support number sense and problem-solving. Symbolic representations, such as numerals, mathematical symbols (e.g., =, +, -), and simple equations, introduce abstract reasoning. Students may also express mathematical ideas verbally through storytelling, word problems, explanations, and acting out scenarios. Using multiple representations provides essential opportunities for all learners to engage and build a strong mathematical foundation.

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 1**, students might be shown a number sentence that represents a picture of a relationship between quantities, for example, six bikes on one side and three on the other may be represented by the inequality 6 > 3. Students might then describe how these show the same relationship in different ways.

- **Multiple Representations:** Tasks incorporate recognizing or using visual, symbolic, verbal, contextual, or physical representations to deepen their understanding. For example, **grade 1** students might be presented with a verbal scenario, draw corresponding pictures, and then write the matching numerical statement. Using tools such as counters, drawings, and physical gestures, they can model mathematical concepts. Emphasizing 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 1** students might choose to draw pictures to represent quantities, arrange tangrams to form geometric figures, use simple diagrams like number lines or bar graphs, or use manipulatives to create representations.

- **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 1** student might be given a picture of fifteen items with six items being taken away and asked what this scenario represents. Students might answer in a variety of ways, such as "fifteen minus six," "9," write the expression "15 – 6," hold up nine fingers, or use multiple other ways to interpret the representation.

- **Translation Between Representations:** Tasks prompt students to connect and translate between different forms of representation. **Grade 1** students may match a drawing to a number sentence or ten frame representation or explain how their picture represents a problem. For example, in response to a verbal statement, "There are twelve huckleberries in a basket, you eat two, how many remain?" students might translate the situation by writing an expression (12 - 2), drawing twelve circles and crossing out two, giving a verbal response ("ten"), or using other forms of representation.

- **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 1**, this might mean asking students to try to come up with as many ways as they can to represent the number "52." When asked how they could represent it visually, students might draw personally relevant pictures, such as 10 hands and two fingers, using number rods and counters, or other means. When asked how they could represent it symbolically, students write an expression where the answer is five (e.g., 50 + 2), the numeral 52, etc. This can continue through all types of representation. The teacher should reinforce that all of these representations provide different ways to show the quantity or relationship.

- **Open-Ended Choices:** Tasks allow students to choose their preferred representation method, promoting creativity and exploration. In **grade 1**, this might look like providing students with options to demonstrate a numerical relationship by drawing, building with manipulatives, or writing numeric expressions. Students should have the flexibility to express their mathematical thinking in a way that makes sense to them.

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 1 Applications:

Grade 1 students begin to engage in collaborative mathematical activities through group work, discussions, and shared problem-solving experiences. At this stage, they are learning to listen to their peers, take turns sharing ideas, and build upon the contributions of others. Collaborative inquiry often involves simple, hands-on tasks where students explore mathematical concepts together, such as counting, solving, or exploring shapes. In grade 1, students are still learning to frame their ideas verbally and respectfully critique the reasoning of others. Special care should be taken to support the development of this mathematical practice by training young learners in appropriate communication and respectful discourse.

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 1**, students might work together to build a shape that matches a teacher-provided description of attributes.

- **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 1** students might be asked to partition shapes into two or four equal shares. They might decide together how to make equal shares and explain their methods to the class.

- **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 represent 87 as tens and ones, **grade 1** students might provide responses and the teacher may prompt "Do you agree or disagree, why?" Students can respectfully discuss why certain responses are accurate (e.g., 20 + 60 + 7) and others are not (e.g., 8 + 10 + 7).

- **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 1** classroom, students may engage in a story problem discussion where one student suggests: "If we have thirteen huckleberries and we get five more, we can count "14, 15, 16, 17, 18!" Another student may add, "Yeah! We would also think of it as ten plus three plus five!"

- **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 1** 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. While working with materials to represent numbers to 120, **grade 1** students may only have a certain number of number rods and counters requiring them to be strategic about how to allocate resources while keeping everyone involved.

- **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. For example, when ordering objects by length, **grade 1** students might share the responsibility of deciding on who should be responsible for each object, and which object should be the comparison object, ensuring that each student has a role and no one is left out.

- **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 1** 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 1 Applications:

Grade 1 students begin 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 and cultural expressions. At this stage, they develop an early awareness of diverse cultural applications in math and an appreciation for its significance in daily life, as well as in Indigenous, local, and global communities.

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 1**, 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 identifying the values of coins handed over at a grocery store, sales made at a vendor booth, weighing animals, adding competition scores, etc.

- 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 1** 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 1** might learn how different cultures perceive 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 1** students might engage in this practice by

considering how mathematical concepts are used as tools in their homes or lives. Some examples might include counting the number of toys they pick up, measuring food for pets or livestock, or checking how many minutes until school starts. 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 1** might include a presentation of a community problem, such as a school beautification project. Students might inquire how they can solve this problem using their content knowledge. They might engage math skills in counting the number of flowers to plant, or volunteers they will need. They might decide the best way to arrange plants in the flower bed, based on relative height, whether two rows contain an equal number of plants, or even determine the best shape to use for a planter.

- **Storytelling and Oral Traditions**: Leaning 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 1** students might be asked mathematical questions during reading time, such as “How do the animals on this page compare in length relative to the giraffe on the last page?” Students will use comparative language to respond such as (bigger, smaller, etc.). Alternately, they might listen to an Elder or community member share their perspective or experience 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 1** 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 1** students might explore counting with different languages or examine different numeral systems.

- **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 1** 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.

- **Ask Open-Ended, Reflective Questions**: Encourage thoughtful exploration by prompting students to analyze and connect mathematics to lived or cultural experiences. Questions such as *"What patterns do you see in this design?"*, *"How does your family use numbers at home?", or "How can counting help us figure out how many chairs we need for our guests?"* invite students to share personal experiences and recognize math in everyday 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 1 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 (REL Southeast, 2020). 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 1 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 20 to solve of all types. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. (MT.1.OA.1)
- 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.OA.2)
- Flexibly compose and decompose numbers to add and subtract. (MT.1.OA.3)
- Understand subtraction as an unknown-addend problem. (MT.1.OA.4)
- Relate counting to addition and subtraction. (MT.1.OA.5)
- Flexibly, accurately, and efficiently add and subtract within 10. (MT.1.OA.6)
- Use multiple strategies to add and subtract within 20. (MT.1.OA.7)
- Understand the meaning of the equal sign and determine if equations are true or false. (MT.1.OA.8)
- Determine the unknown number in an addition or subtraction equation relating to three numbers. (MT.1.OA.9)

Numbers and Operations in Base Ten (NBT)

- Flexibly count, read, write, and represent numbers to 120. (MT.1.NBT.1)
- Understand that ten is a unit composed of ten ones and that a two-digit number represents tens and ones. (MT.1.NBT.2)
- Compare two two-digit numbers using comparison symbols $>, =, and\ <$. (MT.1.NBT.3)

- 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.4)
- Using place value, given a two-digit number, find 10 more or 10 less than the number. (MT.1.NBT.5)
- Subtract multiples of 10 from a two-digit number. (MT.1.NBT.6)

Measurement and Data (MD)

- 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.1)
- 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.1.MD.2)
- Tell and write time in hours and half-hours using analog and digital clocks. (MT.1.MD.3)
- Identify the value of coins. (MT.1.MD.4)
- 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.1.MD.5)

Geometry (G)

- Distinguish between defining attributes versus nondefining attributes. (MT.1. G.1)
- Build and draw shapes to possess defining attributes. (MT.1.G.2)
- Compose new shapes using two- and three-dimensional shapes. (MT.1.G.3)
- Partition circles and rectangles into two and four equal shares. Describe the shares using the words: halves, fourths, and quarters. (MT.1.G.4)

END OF THE GRADE 1 STANDARDS (ELABORATIONS ON NEXT PAGE)

GRADE 1 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 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 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 1 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 1 standards can be effectively taught in classroom scenarios.
- **For Experienced Grade 1 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.

- **Essential Understandings:** According to the Implementation Framework for Indian Education for All:

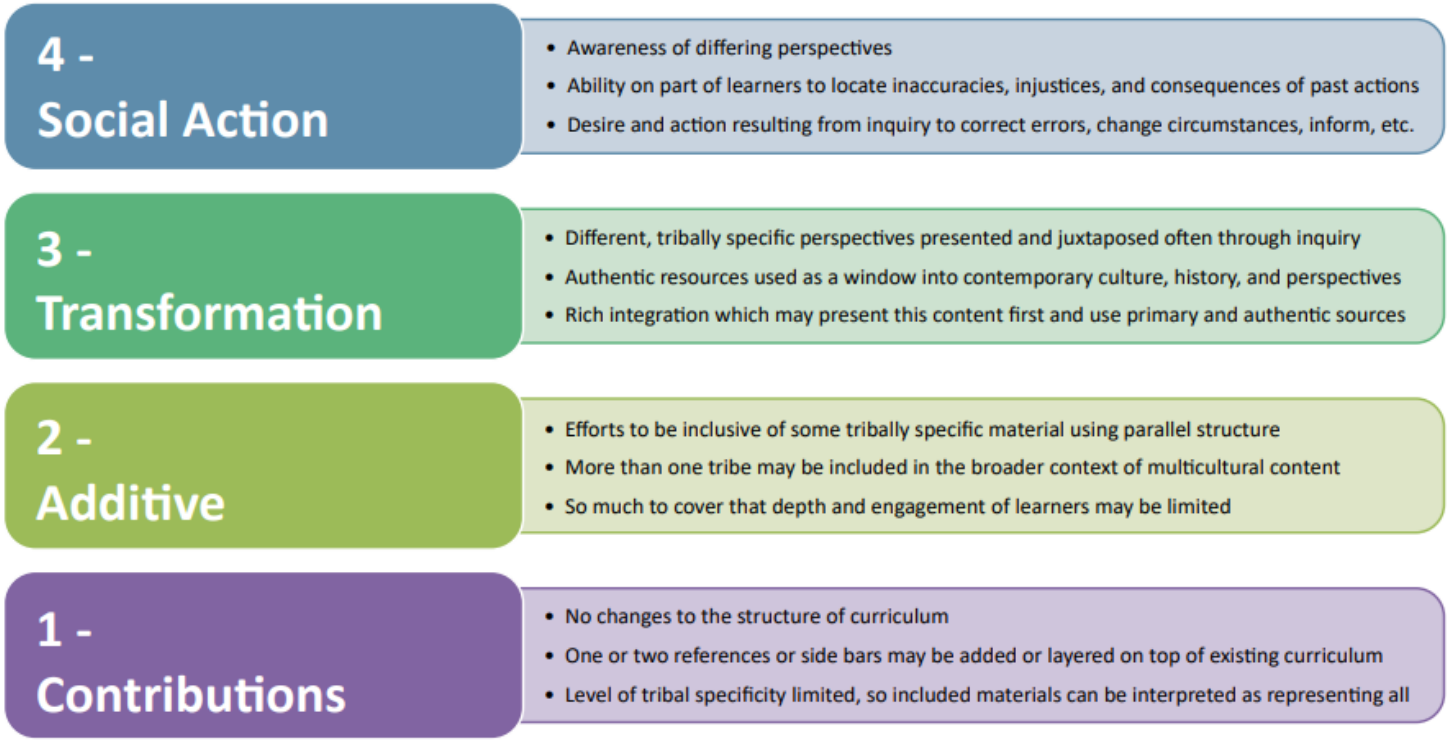
  > "The Essential Understandings were developed by a group of Indian educators representing each Montana tribe, who gathered to attempt to build consensus on a set of common core understandings. These Essential Understandings represent broad concepts common to Montana tribes all students should know. They are gateway standards, or entry points, into the rich histories, cultures, and perspectives of each Montana tribe. The 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.1.OA.1

Use addition and subtraction within 20 to solve problems of all types. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

General Notes:

While kindergarten students learned to add and subtract up to 10, first grade students extend this understanding from adding two numbers within 10 to 20 and expanding the types of problems they are exposed to. First grade students are expected to solve a variety of addition and subtraction problems involving two quantities including those where: a number is added to another (e.g., “What is 6+3”); a number is taken from another (e.g., “What is 20-10?”); two groups are put together (e.g., “How many do we have if we combine 5 and 6?”); a group is taken apart (e.g., “If we start with 12 and take 3 away, how many are left”?); or quantities are compared (e.g., "How does 8 compare to 10?” with responses like “8 is 2 less than 10” or “10 is 2 more than 8”). Students also begin working with problems that include unknowns in all positions, not just at the end of an equation. Students should have opportunities to represent these problems in multiple ways during learning, though their ability to represent in diverse ways should not be assessed in this standard. Examples of representations include using objects or counters, drawing pictures, writing equations with symbol of unknowns, or using verbal reasoning. Exposure to multiple ways of representing will expose students to a variety of strategies for solving and strengthen their tool kit. 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 says, “A rodeo is happening in a local community, there are 16 horses in a corral. Ryan and Skylar take their horses out of the corral to compete in team roping. If two horses were removed, how many are left?” Students solve the problem, using any appropriate representation, to determine that there are 14 horses remaining.
- The teacher shares a scenario: “Our school is preparing for the kindergarten graduation ceremony this weekend. There are two kindergarten classes. Mrs. Heidegger’s class has 9 students and Mr. Hoff’s class has 11 students. How many chairs will they need to arrange for every student to have a seat?” Students might use various methods to solve the problem and determine that 20 chairs will be needed.
- The teacher might provide students with an image of sixteen beads, a subtraction sign, a symbol, blank space, or variable representing the unknown, an equal sign, and five beads to represent the numerical expression “16 - ____ = 5.” They then may ask students how many beads would need to be used by an artist in a design to leave five remaining (subtraction). The teacher may also present this problem beginning with the numerical expression, then using the beads to add context and support problem solving strategies through representations that engage tools such as number bonds, tape diagrams, etc.

IEFA Integration Example: Traditional and Medicinal Plants

Context and Connection:

Varieties of wild mint, such as peppermint, have long been used by Indigenous Peoples across the state of Montana and the Northwest as both culinary and medicinal purposes. Many tribes have specific names for peppermint including: Annishinabe (Chippewa/Ojibwe) “ahmiskowikahskwan”, Ne-i-yah-wahk (Plains Cree) “wácask mícówin ᑲᑕᐦᑭᔭᐁᐧᐸᐩᓯᐠ”, Ksanka/Ktunaxa (Kootenai) “Mata”, Lakota, Dakota (Sioux) “tatedanseca”, Nakoda/Nakona (Assiniboine) “Waȟpé” or “Ceyágadaką”, Séliš (Salish) “xnx̣ éłp”, A'aninin (Gros Ventre) “Wɔɔswɔhɔɔʔ”, and Apsáalooke (Crow) “Shusshua” (Montana Indian Nations, 2023).

These reflect the wide usage and significance of mint in multiple Indigenous communities. Mint continues to be used today, whether harvested from the Montana landscape or purchased in local stores. It is known to support wellness by relieving digestive discomfort, soothing respiratory symptoms, strengthening vital organs, or freshening breath (University of Montana, n.d.).

Task Description:

The teacher begins with a class discussion:

- “Many people get colds during the winter… what happens to your body when you get a cold?” (Students might provide answers such as runny nose, sore throat, headache, etc.)
- “What do your loved ones do for you when you’re sick to help you feel better?” (Students might say: medicine, soup, rest, tea, etc.)

At this point, the teacher can ask students to consider what people did for medicine before grocery stores. They can then explain that people discovered that long ago the earth grows some medicine in the form of plants. While these natural remedies can’t fix every illness, plants like mint can help with tummy pain, stuffy noses, and headaches. The teacher can also share at this time that this Indigenous knowledge has been passed through loved one to loved one for generations and are still used by some today. They may explain traditional or practices of specific tribes or communities, make time for an Indigenous Knowledge Keeper or Elder to speak to the class, briefly share the Harvesting Wild Mint video from the Alberta Professional Learning Consortium, or read the book *Dad is it Time to Gather Mint?* by Tyna Legault Taylor. Then, the teacher will move on to explain that one common traditional medicine used by cultures across the world and Montana includes making mint tea which involves boiling mint leaves in water then drinking the broth.

Then, students are introduced to the idea of helping someone feel better by making mint tea. They solve addition and subtraction problems using mint leaves in a variety of problem types, for example:

- You need 15 mint leaves for your tea. You’ve already added 12. How many more do you need? *(15 - 12 = 3)*
- You had 17 leaves and now only 2 remain. How many have you added to the pot? *(17 - 2 = 15)*

- You added 6 leaves, then added 8 more. How many are there in the pot now? *(6 + 8 = 14)*
- Extension (introduce MT.1.OA.2): Each cup of mint tea uses 7 leaves. You picked 18 leaves. Do you have enough for 2 cups? How many for 3 cups? How many more would you need to collect from your garden? *(7 × 2 = 14; yes, enough for 2 cups. 7 × 3 = 21; need 3 more leaves.)*

This task can be extended with a conversation about the importance of family knowledge and caring for others through shared traditions. Students may also be encouraged to share their own family wellness practices. As a potential extension, bringing in a sample of peppermint tea for students to smell or taste can increase student's ability to store the learning long term.

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:

Additive or Transformation – 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. Engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Montana Indian Nations Sacred Plant Guide – Rocky Mountain Tribal Leaders Council
- Ethnobotany Gardens: Chippewa Cree Tribe – University of Montana
- Harvesting Wild Mint – Alberta Professional Learning Consortium

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** use addition and subtraction within 20 to solve problems of all types without **intensive support**.
2. **Developing:** The student **can** use addition and subtraction within 20 to solve problems of all types with **some support**.
3. **Proficient:** The student **can** use addition and subtraction within 20 to solve problems of all types **with independence and accuracy**.
4. **Mastery:** The student **can** use addition and subtraction within 20 to solve problems of all types **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.1.OA.2

Solve problems in context that call for addition of three whole numbers with a sum less than or equal to 20. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.

General Notes:

This standard extends students' understanding of addition by asking them to combine three whole numbers, rather than just two, with the total sum being less than or equal to 20. This helps build a foundation for flexible and fluent thinking about number combinations and will help reinforce strategies such as making ten, counting on, and grouping known sums in future standards and concepts. This standard does require a contextual application in assessment and instruction – specifically, contexts that relate to Montana Indigenous Peoples and local communities. This provides opportunities to connect math to students' lived experiences and the cultures of Montana to support deeper engagement and comprehension. During instruction, students should be encouraged to show their thinking in multiple ways (e.g., using physical objects, drawings, or equations with a symbol for an unknown value. During assessment of this standard however, it is not required for students to be required to use multiple representations unless a learning target (like mastery) specifically calls for it. This standard supports the development of a strong foundation for complex addition and subtraction, flexible number sense and problem solving, and even working with variables in algebra!

Instructional Examples:

- The teacher introduces 4-H as a youth organization many Montana students participate in. The teacher highlights a variety of events students can engage in such as animal care, baking, crafts, and archery. The teacher focuses on how archery events are scored – each ring on the target has a point value, with the bullseye worth 11 points. Students are given practice scenarios to solve problems involving three addends with sums under 20. For example: a student practicing for a 4-H archery context earns 6,4, and 7 points on three shots. Students determine how many total points were scored using tools like bar models, number bonds, equations, drawings, manipulatives, or number lines.
- According to the Montana Field Guide (n.d.), Rainbow Trout are a common fish found in Montana lakes and rivers, though they are only native to Lincoln county. The average fish can weigh about 10 pounds and the state record fish weighed at 33 pounds! Students can practice adding and subtracting to calculate how many pounds of fish were caught on a fishing trip (e.g., "three rainbow trout were caught on a catch-and-release fishing trip weighing 8, 7, and 5 pounds. How many pounds of fish were caught total?")
- In a collaborative group task, students work in teams of three and are given sets of classroom manipulatives such as counters or connecting cubes. Each student receives a different quantity, and the group is asked to determine the total number of objects. For example, if one student

has 4 cubes, another has 6, and the third has 5, they work together to find the sum. Students explain their thinking using words, pictures, or equations.

IEFA Integration Example: Traditional Games

Context and Connection:

Among some tribes, such as the Séliš (Salish) and Qlispé (Pend d'Oreille/Kalispel), traditional games may involve similar materials but are played using different rules. For example, the Qlispé game *Hoop and Arrow* assigns point values to colored beads on a hoop, and players score based on which bead lands closest to their arrow. In contrast, the Séliš game *Hoop and Dart* awards one (1) point for hitting the netting and three (3) points for passing through the center hole. Both games involve rolling a hoop and aiming a stick or arrow at it. These games were traditionally taught in early spring when food stores were low and men left the camp to hunt large game, leaving youth responsible for securing small game. The games taught essential values such as truth, integrity, and survival skills. In the Qlispé version, point values for each of the six beads are agreed upon by players before beginning the game. Players then work in teams to accumulate the highest total score. Variations of hoop and arrow games are found in other tribal communities across Montana with different interpretations, strategies, and rules. Traditional games, including variations of Hoop and Arrow, are not merely historical – they are played to this day and continue to teach traditions and values to children across Montana communities.

Task Description:

The teacher begins by explaining the cultural context and rules of the *Hoop and Arrow* game. Students work together to agree on point values for the six colored beads, and the teacher records these visibly for reference. Students form teams of three and take turns playing the game, recording their scores after each turn. They then use addition to calculate the total number of points earned by their team in a round, adding three values together with a total not exceeding 20. The teacher may provide scaffolding if students' scores go beyond 20 or if differentiation is needed. If the physical materials are not available, teachers may instead show a segment from the *Native American Traditional Games* video (04:44–07:02) and provide hypothetical score scenarios for students to solve. Teachers are encouraged to reference the *IEFA Traditional Games Unit* for further guidance.

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:

Additive or Transformation – 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. Creating opportunities for students to engage with the game allows students to consider the perspectives, traditions, and teachings of specific Tribes or Indigenous individuals, supporting connections to contemporary experiences and activating a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Traditional Games Unit – Montana OPI IEFA
- Native American Traditional Games – Montana OPI IEFA – YouTube
- International Traditional Games Society

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** solve problems in context of all types that call for addition of three whole numbers with a sum less than or equal to 20 without **intensive support**.
2. **Developing:** The student **can** solve problems in context of all types that call for addition of three whole numbers with a sum less than or equal to 20 with **some support**.
3. **Proficient:** The student **can** solve problems in context of all types that call for addition of three whole numbers with a sum less than or equal to 20 **with independence and accuracy**.
4. **Mastery:** The student **can** solve problems in context of all types that call for addition of three whole numbers with a sum less than or equal to 20 **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.1.OA.3

Flexibly compose and decompose numbers to add and subtract.

General Notes:

This standard requires students to demonstrate strong sense of number by working with numbers in flexible and strategic ways. Flexibility, in this context, refers to a student's ability to adjust how they break apart (decompose) or put together (compose) numbers to make addition and subtraction more manageable based on the numbers involved.

For example, if presented with a problem such as 1 + 6 + 9, a student may recognize that 1 + 9 = 10 and choose to use combinations that are easier to compute by rewriting the problem as 10 + 6 = 16. In subtraction, a student solving 12 – 2 might notice that 12 is equal to (10 + 2) – 2 = 10. These strategies may be utilized mentally or with support of tools like counters, ten frames, number lines, or other visual diagrams, and students may not always write their steps formally. This is acceptable when a student can explain or show their process or reasoning.

The ability to engage in this standard with accuracy is dependent on the students' emerging understanding of the communitive property of addition (a + b = b + a), and the associative property of addition [a + (b + c) = (a + b) + c]. Students are not expected to name these properties within this standard, but they should be able to apply them intuitively. Teachers should take care to clarify that these properties do not apply to subtraction, as this is a common source of misconception for students (e.g., 6 – 3 ≠ 3 – 6).

The ability to flexibly compose and decompose numbers to add and subtract is essential to students' ability to work with multi-digit numbers quickly and efficiently in later grades. These skills also foster adaptive mathematical thinking by equipping students with the ability to identify when certain strategies may be more effective or efficient.

Instructional Examples:

- A teacher might ask students a simple question such as "What is 8 + 5?" However, rather than explicitly state how students should solve the problem, they encourage students to try different strategies and explain their thought process. Students might share a variety of solutions, such as "I took 2 from 5 to make 10 + 3 and got 13," "I rewrote the problem as 3 + 5 + 5 to make 3 + 10 and got 13," or other methods.
- A teacher might ask students to evaluate 13 – 4 and show as many strategies as they can. Example responses might include "I made 9 + 4 – 4 = 9," students might show their thinking using counters or manipulatives to form pairs to determine the final answer, or students might use other compositions or decompositions.

IEFA Integration Example: Hoop Shoot

Context and Connection:

Basketball is a popular sport among many Montana communities, including Montana Indigenous communities. It is played recreationally, in schools, and in tournaments. It fosters teamwork, strategy, and physical activity. Many annual events in Indigenous communities, such as Crow Fair, the Arlee Celebration, the Kiyiyo Powwow, and beyond host basketball tournaments and “hoop shoot” competitions.

In the interest of making the task simple for students, it will engage the context of hoop shoots rather than basketball games or tournaments. Many powwows across the state of Montana host these events and, to increase local relevancy, teachers are encouraged to seek out local Indigenous celebrations that may engage the context. These events are a popular part of celebrations because of their ability to bring together players and spectators from the local and wider community. Hoop shoots can also serve as a context for mathematical thinking, including addition and subtraction.

Task Description:

The teacher introduces a hoop shoot-themed activity and discusses the importance of basketball to some members of Indigenous communities. They may select a state event, such as the Crow Fair, Arlee Celebration, High School Powwows, or other local events. Students can explore how hoop shoots have become a modern tradition at many powwows and community events, connecting cultural events to everyday experiences and math skills like keeping score or counting attempts: "At the [insert appropriate event] hoop shoot, your team made 25 attempted shots but only successfully made 15 shots. How many shots did your team miss?”, “You make four shots, your teammate Noah makes eight, and your other teammate Makayla makes six. How many shots did your team make total?” or any other contextual problems.

To support the flexible composition and decomposition of numbers in this task, the teacher might ask students to record the addition and subtraction problems using numerical sentences (e.g., 25 – 15) and provide manipulatives such as counters or blocks to support thinking. They may also encourage students to share unique strategies to foster mathematical discourse and appreciation of alternative approaches.

The teacher might also consider extending the activity by asking questions that have students reflect on the nature of traditions, such as “Why do you think basketball and hoop shoots have become such a big part of cultural events like powwows?”, “How do traditions grow and change over time?”, or “What is your favorite tradition of your family or our community? What makes it a tradition?” Alternatively, the teacher might take students into the school gym or use a trashcan or small basketball hoop to have students model the scenarios physically.
For extended practice, the teacher could provide a worksheet of examples for students to worth through, provide an error analysis example for students to correct, or provide multiple strategies and have students discuss which strategy showed the most flexibility.

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:

Additive or Transformation – 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. Creating opportunities for students to engage with the game and reflective questioning allows students to consider the perspectives, traditions, and teachings of specific Tribes or Indigenous individuals, supporting connections to contemporary experiences and activating a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Native Ball: Legacy of a Trailblazer – Montana PBS
- Experts say basketball enlivens old traditions on contemporary reservations – Montana State University

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** flexibly compose and decompose numbers to add and subtract without **intensive support**.
2. **Developing:** The student **can** flexibly compose **or** decompose numbers to add **or** subtract with independence and accuracy **or** can engage all skills with **some support**.
3. **Proficient:** The student **can** flexibly compose **and** decompose numbers to add **and** subtract **with independence and accuracy**.
4. **Mastery:** The student **can** flexibly compose **and** decompose numbers to add **and** subtract **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.1.OA.4

Understand subtraction as an unknown-addend problem.

General Notes:

In this standard, students begin to lay the foundation for multiple algebraic reasoning concepts such as working with unknowns and recognizing the relationship between addition and subtractions. In general, subtraction problems have three parts, the minuend (the starting quantity), the subtrahend (the amount being taken away), and the difference (the result of subtraction). While students are not expected to learn or use these terms, understanding the relationship between these values can help educators explain why subtraction can be solved by identifying the unknown addend. For instance, in the problem 10 – 8 = ___, students can consider: "What do I add to 8 (subtrahend) to get 10 (minuend)?" The unknown addend, 2, is the difference. Students may also choose to reinterpret the equation as an additive expression 8 + ___ = 10, to determine that the unknown value is 2.

This understanding can be supported by the use of visual aids, such as number lines, number blocks, counters, ten frames, or number bonds. Teachers can also guide students to rewrite subtraction problems as related addition equations. These skills encourage strengthening of number sense and create a foundation for concepts involving inverse operations, negative values, and solving for unknowns in algebraic contexts.

Instructional Examples:

- A teacher presents the equation 12 – 8 = ___ and asks, "What number fills in the blank?" Instead of telling students to subtract, the teacher might prompt "What number do you add to eight to get twelve?" Students might use a variety of resources to show that 8 + 4 = 12, so the missing number is 4.
- During a story problem, the teacher might say, "There are ten cows in a pen. The rancher moves some to a trailer. There are six left. How many did the rancher put in the trailer?" Students might discuss how they can think of the problem as 10 - ___ = 6 or 6 + ____ = 10 to show understanding that subtraction can be seen as finding an unknown addend.
- The teacher might post a number sentence such as __ + 7 = 15 and ask students to describe a subtraction problem it represents. Students might say "That's like fifteen minus seven equals blank," connecting symbolic representations with verbal statements and recognizing that subtraction can be solved by thinking about what number completes the addition.

IEFA Integration Example: The Bitterroot (Spe᷂m)

Context and Connection:

The Bitterroot is the state flower of Montana and many Séliš (Salish), Ksanka/Ktunaxa (Kootenai), and Qĺispé (Pend d'Oreille/Kalispel) people traditionally gather the roots of these flowers in the mid-to late spring between April and June, during the two-week window that roots are tender and

ready for harvesting. The harvest is guided by important traditions and ceremonies, and many communities request that people seek permission before harvesting these plants (Bleeker & Aldrich). During the event, harvesters take great care to protect the plant's survival by leaving younger plants to grow and selecting only mature roots. These traditions continue today in St. Ignatius, Montana, where community members of all ages share the practice with younger generations at an organized dig every year (Bleecker & Aldrich, 2024). These days, harvesting camps can include traditional or modern camping gear, meaning that some families or individuals may choose to continue to erect teepees in the traditional way, while others may opt for campers or tents.

This task is based on an Elder, Oshanee Cullouyah Kenmille's experience as a young girl at a bitterroot harvest event in the Mission valley as a young girl in the 1920s. Both historic and contemporary practices, traditions, and stories related to the bitterroot flower exist among multiple tribes across Montana and Idaho. To increase local relevance, teachers may consider adapting this activity to engage practices and contexts specific to Tribes that are relevant to the local community.

Task Description:

The teacher will begin by sharing the video: Oshanee Cullooyah Kenmille: A Joyful Spirit with students. They may also read the story *The Gift of the Bitterroot* by Antoine Sandoval, illustrated by Johnny Arlee. In the video, Elder Oshanee Cullooya Kenmille describes seeing many teepees gathered during the Bitterroot harvest in Missoula, and how once the harvest was done, families packed up and traveled back to Arlee. The teacher will emphasize this detail of the families leaving after the harvest to set the context for this activity and clarify that these practices continue today among certain communities, but that teepees are not always used today.

The teacher will then help students think mathematically about this situation, asking how one could figure out how many families remain when some leave. For example, "Imagine you are there with Oshanee in Missoula all that time ago. You can see the teepees and the families leaving. Suppose there were twenty families in the camp, and six families decided to head home. How can we find out how many families are staying?" Students should generate initial ideas through discussion and should have access to visual or physical tools (ten frames, tiles, counters, drawing tools, etc.) to support thinking. Some students might provide methods that show "20 – 6 = ___" while others might provide methods that show "6 + ___ = 20." The teacher will encourage all methods, allowing the class to explore the different strategies in a "number talk" fashion.

The teacher guide students to recognize that both 20 – 6 = ____ and 6 + ____ = 20 yield the same answer for the unknown, or "variable" part of this problem. They should help students make a conjecture about how they could use this observation for other problems and provide additional examples for students to test (e.g., "Do 15 – 10 = ____ and 10 + ____ = 15 give us the same answer for the unknown?"). After exploring a few examples, students should see how subtraction can be thought of as an unknown addend problem, and the teacher should provide an adequate number of practice problems to solidify this understanding.

For a wrap up task, students will draw a picture of their own scenario (e.g., a camp with teepees, some families leaving, some staying, or a context that is personally relevant). Then under the picture, students will write number sentences that represent their picture and match their drawing, one sentence should use subtraction, the other, addition.

For reflection, the teacher might ask questions such as: "Which way do you like better for finding how many are left? Subtracting? Or adding the missing number? Why?", "If you count how many are staying, what does that tell you?", "Why is it helpful to know that subtraction can be written as 'something plus something equals total?'", "How might people in Oshanee's time have used ways like this when watching who stayed or who left during a harvest?", "What would it feel like if you were there and saw many families leaving – how would you figure out how many were left quickly?", etc.

Additional note: Some students may suggest it is easier to just count the number of items remaining instead of using subtraction or addition. If this is the case, remind the student that we don't always work with numbers that represent things we can see, and that sometimes, we work with numbers that are much too big to count ourselves. This is why we practice addition and subtraction.

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:

Transformation - Engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Oshanee Cullooyah Kenmille: A Joyful Spirit – Montana Women's History
- The Bitterroot (Spe̓x̱m) – Mathkind
- *The Gift of the Bitterroot* (Children's Story by Antoine Sandoval) – Salish Kootenai College
- The Story of the Bitterroot: Part 1 – Big Sky Pictures and Montana Film Office

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** understand subtraction as an unknown-addend problem without **intensive support**.

2. **Developing:** The student **can** understand subtraction as an unknown-addend problem with **some support**.
3. **Proficient:** The student **can** understand subtraction as an unknown-addend problem **with independence and accuracy**.
4. **Mastery:** The student **can** understand subtraction as an unknown-addend problem **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.1.OA.5

Relate counting to addition and subtraction.

General Notes:

In this standard, students must begin to connect the concepts of counting to addition (counting on) and subtraction (counting back). For example, in the problem 10 + 3, students may determine the solution by counting on "11, 12, 13", while in a problem such as 12 – 4, students might count back "11, 10, 9, 8."

Relating the concept of counting to operations provides students with accessible and strategic tools for problem-solving and reinforces students' understanding of number sequence, cardinality, and one-to-one correspondence. These lay the foundation for later skills like identifying missing addends and recognizing fact families. As students become more fluent in addition and subtraction by gaining the ability to work flexibly, accurately, and efficiently, they may begin to understand that subtraction is the inverse of addition, specifically that counting forward makes a value larger while counting backward reduces it.

This understanding can be supported with the use of visual tools such as number lines, fingers, ten frames, hundreds charts, and other concrete representations.

Instructional Examples:

- The teacher models a problem such as 5 + 3 using counters. As students count, the teacher highlights that one way to add is to count on: "Start at five, then count six, seven, eight." Students will notice that when you add, you count forward.
- In a subtraction story, the teacher might say: "You have nine stickers and you give away three to your friends. Let's figure out how many you have left by counting back… eight, seven, six." Students should connect subtraction with counting back and be able to describe what happens to the town as they count down.

- Students might play a number line game where they roll a die on each turn to move their marker forward (for addition) or backward (for subtraction). The teacher can encourage students to explain how counting on or counting back helps them solve problems like 7 + 2 or 10 – 3 without needing to write an equation.

IEFA Integration Example: Traditional Games – Rock in the Fist

Context and Connection:

"Rock in the Fist" is a hiding game for children that builds skills necessary to learning adult stick games. This game was played by children in many plains tribes across Montana, and the Niitsitapi/Amskapi Pikuni (Blackfeet) way of playing is shared by Buffalo Jump State Park. Traditionally, players sit across from one another and take turns hiding a small rock in one hand, and the other player attempts to guess which hand is hiding the rock. If the second player guesses incorrectly, the hider earns a stick. If the second player guesses correctly, they earn a stick. The first player to collect three sticks wins. Once players understand the basics of the game, a tournament can begin.

Task Description:

Students will first learn how the game Rock in the Fist is played. The teacher or a Knowledge Keeper will explain the rules and demonstrate the process to students. To play, students will need a small rock, three counting sticks (craft sticks, straws, or rods work well), a sheet to record scores, and potentially a visual number line or ten frame, if support is needed.

Students will begin to develop comfort with the game by playing in pairs. To practice number sentences, have students count and record how many sticks they have after teach round. For example, "You had one stick then you won another, how many do you have now?" (1 + 1 = 2), or "You need three sticks to win. You have 2. How many more do you need?" (3 – 2 = 1).

Once students are familiar with the game, have them engage in a bracket tournament. As students move forward, have them track the number of rounds they have won and relate it to cumulative addition. For example, "I played two rounds and won 1. If I win one more, how many wins will I have in total?" Alternatively, the teacher could have students keep track of the number of successes and incorrect guesses to total how many rounds they played. For example, "I guessed correctly six times but incorrectly four times. I guessed ten times total." (6 + 4 = 10). Students could also form number sentences to represent their net number of sticks. For example, "I guessed correctly six times but incorrectly four times, so I ended up with two sticks." (6 – 4 = 2).

Students may be encouraged to model their game play in many ways, including tallies, ten frames, pictures, counters, number sentences, etc. At the end, students can choose from small classroom rewards as part of a generosity-based "giveaway." This too can serve as an opportunity to connect counting to addition and subtraction, by having students count the items they are giving or receiving and describing the exchange mathematically. For more information on how to conduct a mini giveaway, please review the OPI Traditional Games Unit.

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:

Additive or Transformation – 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. Creating opportunities for students to engage with the game allows students to consider the perspectives, traditions, and teachings of specific Tribes or Indigenous individuals, supporting connections to contemporary experiences and activating a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Traditional Games Unit – Rock in the Fist – OPI IEFA
- Tie-Up Game and Rock in the Fist – First Peoples' Buffalo Jump State Park

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** relate counting to addition and subtraction without **intensive support**.
2. **Developing:** The student **can** relate counting to addition **or** subtraction with independence **or** can engage both skills with **some support**.
3. **Proficient:** The student **can** relate counting to addition **and** subtraction **with independence and accuracy**.
4. **Mastery:** The student **can** relate counting to 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.1.OA.6

Flexibly, accurately, and efficiently add and subtract within 10.

General Notes:

This standard is a crucial fluency benchmark for Grade 1 as a foundation for working with larger values and more complex operations in the future. Students are expected to demonstrate flexibility, accuracy, and efficiency when adding and subtracting within 10.

- **Flexibility** refers to a student's ability to choose and strategically use meaningful, creative, and innovative problem-solving strategies, relations, 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 skills including but not limited to counting on or counting back, applying the relationship between addition and subtraction (e.g., using 8 + 2 = 10 to solve 10 – 2), create equivalent but easier known sums (e.g., solving 3 + 4 by reimagining it as 2 + 5), or using known doubles or make-ten strategies. While concrete or visual aids such as counters, ten frames, number lines, or fingers can support this early understanding and accuracy, students should gradually move toward more advanced strategies as their numerical fluency increases. For example, although finger counting may be accurate and easy to employ within 10, it will not remain efficient as problem solving complexity increases.

Instruction should support students in developing a multitude of strategies and recognizing which approaches are most efficient in particular contexts. Mastery of these skills will support students in grade 1 and beyond by equipping them with the skills required to confidently approach multi-digit operations and problem-solving in later grades.

Instructional Examples:

- The teacher presents a problem such as 7 + 3 and asks students to show as many ways as they can to find the sum (total). Students might use a variety of methods, such as fingers, ten frames, counters, mental strategies, etc. The focus should be on choosing strategies that make sense, not just ones that are quick.
- During small groups, students solve problems such as 9 – 6 using different approaches, such as counting back, using known facts, modeling with cubes, etc. The teacher will highlight that being flexible means knowing more than one way, and that being accurate and efficient means choosing a method that works best to give the right answer.
- Students might play a quick game, such as "make ten" with cards numbered 0-10. They can draw two cards and decide whether to add or subtract to get as close to ten as possible. The students should provide reasoning such as "Eight plus two is ten" or "10 – 7 = 3."

IEFA Integration Example: Traditional Foods – Wheel Bread

Context and Connection:

Once flour was introduced to Indigenous Peoples through trade and later through commodities, breads were cooked on coals and later ovens. Wheel Bread, Bannock, Frybread, and Pan Bread are flat, round breads that are very versatile. There are unique recipes 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 on multiple levels, 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 Wheel, Bannock, Pan or Frybread, read the book *Fry Bread* by Kevin Noble Millard and illustrated by Juana Martinez-Neal, or ask a community member or Knowledge Keeper to share their experiences with Indigenous breads. The teacher should then share a recipe from the *OPI Traditional Foods Recipe Book* that was provided by Elder Myra Walker from Fort Belknap. Ms. Walker's recipe provides Nutrient Content per Serving. Students will use this context to exercise fluency of addition and subtraction within ten while also developing a baseline understanding of nutrition. To support this understanding, the teacher should ensure that students understand that a serving is a recommended amount of food to eat for one person to get the nutrition they need. The teacher might front load this lesson with a basic nutrition lesson to help students understand the concepts like "fat," "protein," "fiber," and "servings."

The teacher might explain a scenario students will understand. For example, "Imagine that your friend's mom has invited you over for dinner and she is serving Myra's wheel bread. It is so good, you eat multiple servings. We are going to do some math to figure out how much nutrition you got from this meal." Then, the teacher will present a number of examples using information from Ms. Walker's recipe. Examples may include:

- Each serving has two fats. You ate three servings of bread. How many grams of fat did you eat? (2 + 2 + 2 = 6).
- Four servings of wheel bread have four fiber; you think you'd rather eat two pieces instead. How much fiber will you have eaten? (4 – 2 = 2)
- The bread is supposed to be cooked for ten minutes on each side. You have only cooked one side for six minutes. How much longer do you need to cook the bread? (10 – 6 = 4).
- Three batches of wheel bread require nine cups of flour. You have poured three cups of flour. How many more do you need? (9 – 3 = 6)

Students should feel comfortable employing multiple methods and strategies for solving problems such as counting on/back, rewriting subtraction as addition, using visual aids, etc. For a fun extension, consider ways to bring the recipe to students so they can try the food themselves.

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:

Additive or Transformation– Describing the specific experiences of Indigenous individuals, drawing connections between traditions**,** policies, or stories associated with multiple Tribes, or including tribally specific resources would achieve the level of "additive." Alternatively, engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- *Fry Bread* by Maillard & Martinez-Neal (Children's Story)
- My Plate Lessons for Grades 1 & 2 - USDA
- Traditional Foods in Montana School Meals – No Montana Kid Hungry
- Indian Frybread History – Crazy Crow Trading Post

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** flexibly, accurately, and efficiently add and subtract within 10 without **intensive support**.
2. **Developing:** The student **can** flexibly and accurately add **or** subtract within 10 with independence **or** can flexibly and accurately add **and** subtract within 10 with **some support**.
3. **Proficient:** The student **can** flexibly, accurately, and efficiently add **and** subtract within 10 **with independence and accuracy**.
4. **Mastery:** The student **can** flexibly, accurately, and efficiently add **and** subtract within 10 **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.1.OA.7

Use multiple strategies to add and subtract within 20.

General Notes:

This standard emphasizes the use of multiple strategies (flexibility) to evaluate addition and subtraction within 20. Unlike MT.1.OA.6, this standard allows students to focus on accuracy and flexibility without expecting them to select the most efficient strategy. The goal of this standard is to provide space for students to explore and compare strategies, develop an understanding of how different approaches work, and begin to recognize which methods are most helpful in certain situations or contexts. This exploration supports the development of the ability to engage multiple strategies and operate with efficiency across lower elementary grades.

Instruction should expose students to a variety of strategies such as: counting on or counting back, making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 - 8 = 4); creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13); using known doubles; or making ten strategies. Students may also utilize manipulatives and visual aids such as number lines, counters, ten frames, or diagrams to support their understanding and ability to accurately compute the sum or difference. These tools can be particularly useful as students build mental strategies and begin to transition toward more abstract or internalized thinking.

Instructional Examples:

- The teacher might pose equations such as 14 – 8 = ____ and ask, “How can you figure this out?” Students can use a variety of strategies and should be encouraged to describe their chosen method. The class, or small groups might compare which strategies felt the easiest or most efficient. Students might begin to recognize that what feels ‘easy’ for one student, may not feel ‘easy’ for another, and develop the ability to value alternative approaches.
- Students might solve problems such as 9 + 7 and compare the strategies they used. The teacher might highlight how using multiple strategies builds flexibility and deep understanding about the connections between numbers.
- The teacher might lead a game called “Strategy Swap” where students solve an equation using their preferred strategy, then switch with a partner and try to solve it a new way. Examples might include using a number line, manipulatives, mental math, counting on, counting back, etc.

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). 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 drive 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.

Task Description:

This task will engage a 3-Act Math Task protocol. For those unfamiliar, this method was made famous by Dan Meyer as a strategy for engaging students in problem solving and critical thinking. There are three stages or "acts" to these tasks. The following activity engages these acts in a manner appropriate for grade 1 students in the context of the Kootenai and Cree game commonly called "Ring and Stick" or "Ring the Stick."

Background & Introduction – The teacher should describe the purpose and overview of the task. They should show the video from Great Falls Public Schools - IEFA Traditional Game: Ring the Stick (time 0:00 – 3:00), describe the game themselves, or have a community Knowledge Keeper describe or demonstrate the game, if appropriate. The teacher should explain to students that they will be encouraged to think of mathematical questions during the task, explain what a mathematical question is, and provide some examples and non-examples.

Act 1 "Notice and Wonder" – Present a clip of the video from Great Falls Public Schools - IEFA Traditional Game: Ring the Stick (time 3:00 – 4:37). It is recommended that you mute this video while playing, so students may form questions without distraction. In the video, students will observe TJ IronBear playing the "Ring & Stick" game with the small and large sticks.

After watching, the teacher should ask students: "What did you notice?", "What did you wonder?" While non-mathematical questions are ok and should be acknowledged, the teacher should encourage students to think of questions that can be answered with math. The teacher might prompt questions like "How many times did he try with the small hoop? How many times with the large hoop?" or "How many did he make (successful hits) and how many did he miss?", "How many total times did he try?", etc.

The teacher should settle on a single question with the class. For example, "How many do you think he made all together?" How many did he miss? How many more did he make than miss?" and let students estimate. Note that these answers will likely be all over the map. The students are making a conjecture that they will test in the second act. The teacher should ask students "What would we need to know to find the answer?" Example responses might include "How many he tried", etc.

Act 2 – "Gather Information and Solve" – The teacher should have students rewatch the video, asking them to count the following using tallies:

- Total attempts with small stick
- Total attempts with large stick
- Total successes with small stick
- Total successes with large stick

Using these numbers, students should try multiple strategies to answer the following questions:

- How many attempts did TJ try total?
- How many more misses than hits? Hits than misses?
- If TJ tried ten more times, how do you think his hits and misses might change (conjecture only)?

The teacher can support the above thinking by offering tools like ten frames, counters, tally marks, drawings, etc. Students might also work in pairs or small groups if appropriate.

Act 3 – "Reveal, Reflect, Extend" – The teacher should reveal correct totals and show methods used by different students. The class might compare strategies such as counting on, adding in parts, drawing pictures, using ten frames, etc. The teacher could also ask extension questions if students seem to be gaining understanding, such as "What if he played 20 more times with the small hoop? How many misses and makes do you think he would have if the pattern stayed the same? Why do you think this?"

To extend learning, the teacher might have students play the game themselves using the materials TJ IronBear recommended.

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:

Additive or Transformation– Describing the specific experiences of Indigenous individuals, drawing connections between traditions**,** policies, or stories associated with multiple Tribes, or including tribally specific resources would achieve the level of "additive." Creating opportunities for students to engage with the game allows students to consider the perspectives, traditions, and teachings of specific Tribes or Indigenous individuals, supporting connections to contemporary experiences and activating a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- IEFA Traditional Game: Ring the Stick – Great Falls Public Schools
- Traditional Games Unit – OPI IEFA
- 3 ACT Math Tasks – Tap into Teen Minds

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** use multiple strategies to add and subtract within 20 without **intensive support**.
2. **Developing:** The student **can** use multiple strategies to add **or** subtract within 20 with independence **or** can engage both skills with **some support**.
3. **Proficient:** The student **can** use multiple strategies to add **and** subtract within 20 **with independence and accuracy**.
4. **Mastery:** The student **can** use multiple strategies to add **and** subtract within 20 **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.1.OA.8

Understand the meaning of the equal sign and determine if equations are true or false.

General Notes:

This standard requires students to understand that an equal sign implies that two expressions represent the same quantity. They must then use this understanding to determine whether an equation shows a true relationship between two expressions or a false one. In this context, true implies that both sides of the equation are in fact equivalent (e.g., 6 + 1 + 3 = 5 + 5) while false indicates that the two sides of the equation are not equivalent (e.g., 2 – 1 = 1 – 2). In first grade, these expressions will only involve addition (+) and subtraction (-).

Equations may be presented in a variety of formats (e.g., 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 4, 6 – 1 = 1 – 6, etc.), yet in keeping with grade level expectations.

Instructional Examples:

- In the beginning, a teacher might write a sentence like 7 = 7 and ask, “What does the equal sign mean?” Students might answer a variety of ways, such as “It shows both sides are the same.”, “The amount is balanced.”, “The two values are the same.”, etc. Students should understand that the equal sign does not necessarily mean “The answer is.” The teacher then shows problems such as 7 = 5 + 2 and asks students if the statement is true or false. This can be strengthened by using scales to make the abstract more concrete.
- Students will begin to explore more complex equations like 3 + 4 = 2 + 5 and 6 + 1 = 8 using counters or balance scales. They should test whether both sides have the same total. When the scales are balanced, students see that both sides are equal and can begin to describe why some equations are true and others are false.
- During a true or false warm up, the teacher might display statements such as 9 = 9, 4 + 3 = 8 – 1, and 5 + 2 = 3 + 3. Students should first predict, then prove their thinking using drawings or manipulatives. A class discussion should focus on understanding that an equal sign shows the relationship between two expressions, not just the result of an operation.

IEFA Integration Example: Trade and Traditional Foods – Pemmican

Context and Connection:

Across the Plains, pemmican was a vital food source that was used for both survival and trade. It is typically made by combining dried meat, animal fat, and dried berries. While nearly every tribe is known for making pemmican, one tribe in particular was well known for trading it – the Annishinabe/Métis (Little Shell Chippewa). Because the Métis were often fluent in both Indigenous and European languages, and knew how to navigate multiple cultural systems, they played an important role in trade relations and economies. In trade, equality and fairness matter. Traders

negotiated exchange rates to ensure what was given and what was received were equivalent in perceived value. In this task, students will explore how trade equity might be analyzed using mathematics.

Task Description:

The teacher might begin by providing a brief history of trade between the Metis and other Tribes or trading companies. They might emphasize pemmican as essential to this trade by describing how it was produced and used. Using images, maps, videos, short readings, or the “P is for Pemmican” coloring page can support this understanding.

Then, the teacher should prime mathematical thinking by asking questions such as: “What does ‘equal’ mean in trade?”, “Why would a trade feel unfair?”, “How could we use equations to decide if a trade is fair?”, etc. The teacher should then present a series of trade scenarios involving only two items: bags of pemmican and hides. For simplicity, treat one bag of pemmican equal to one hide in value, so that combinations can be compared directly. Example problems might include:

- 8 bags of pemmican + 4 hides = 12 items. Is this true or false?
- 6 bags of pemmican + 2 hides = 10 items. Is this true or false?
- 3 + 15 = 18. True or false?
- 4 + 3 = 1 + 5. True or false?

Students should have access to counters, drawing tools, or pictorial representations so they can model both sides of the equation and check whether they match. Teachers might extend the activity by inviting students to design their own trade: pick some number of pemmican bags and hides, write to equations, then swap with a classmate. Each student should then check whether their partner’s equation is fair and justify their thinking using modeling or reasoning. To wrap up, students should be brought back together to share methods, discuss which trades seemed fair or unfair, and reflect on what they learned about the equal sign and about trade fairness.

For a social action or social-emotional learning tie in, students could be engaged in a discussion about whether equality is the same as fairness. Examples of reflection questions might include:

- “Does equal mean fair? If two trades both have the same numbers, do they always feel fair to both people? Might one person feel hurt even if the numbers match? Encourage thinking: maybe a person has less to give, or one person values hides more than pemmican, etc.
- “Why might someone agree to a trade that is not exactly equal in number?”
- “Can you imagine a trade that is equal in numbers but unfair in life? What would that look like?”
- “How is this idea of fairness in trade similar to fairness in your classroom or community?”
- “If you were making rules for trading in class, how would you make sure trades are fair (not just equal) for everyone?”

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:

Additive, Transformation, or Social Action – Describing the specific experiences of Indigenous individuals, drawing connections between traditions associated with multiple Tribes, or including tribally specific resources would achieve the level of "additive." Alternatively, engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level. There is also a possibility of reaching the "social action" level of the multicultural framework through the exploration of themes like "fairness" through the context of making rules for fair trade or treatment in the class or community.

Relevant Resources:

- MT OPI - Traditional Foods Recipes
- Manitoba Metis Federation – Pemmican Videos, Recipe, and History
- Virtual Museum of Metis History and Culture – The Hudson Bay Company Trading System
- Virtual Museum of Metis History and Culture – P is for Pemmican Coloring Page
- Mariah Gladstone, Indigikitchen – Recipe for Pemmican

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** understand the meaning of the equal sign and determine if equations are true or false without **intensive support**.
2. **Developing:** The student **can** understand the meaning of the equal sign and determine if equations are true or false with **some support**.
3. **Proficient:** The student **can** understand the meaning of the equal sign and determine if equations are true or false **with independence and accuracy**.
4. **Mastery:** The student **can** understand the meaning of the equal sign and determine if equations are true or false **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.1.OA.9

Determine the unknown number in an addition or subtraction equation relating to three numbers.

General Notes:

In this standard, students will be exposed to equations with an unknown value – often represented by a box, question mark, blank line, or variable. Students are expected to determine the value that makes the equation true. Examples might include: 8 + ? = 11; 5 = ___ - 3; 6 + 6 = [ ], etc.

Students must have a solid understanding of MT.1.OA.8 to engage productively with this standard and ensure that they understand the meaning of the equal sign and possess the ability to determine whether equations are true or false. Although problems of this nature will grow increasingly more complex as the student advances, in grade 1 problems should involve only addition (+) and subtraction (-), be limited to three numerical values, use only whole numbers (no decimals or fractions), and remain consistent with grade level expectations.

To engage productively with this standard, students benefit from instruction that moves intentionally from concrete to pictorial to abstract representations. Tools and strategies such as number bonds, counters, scales, and number lines help students model the relationships among known and unknown quantities in concrete and developmentally appropriate ways. These scaffolds enable students to make sense of equations with an unknown value and build the conceptual understanding necessary to work accurately with symbolic representations.

Instructional Examples:

- The teacher might write an equation, such as 8 + ___ = 13 and ask, “What number makes this true?” Students could use different strategies, such as counting on, using a number line, or recall to find the missing number. The teacher should prompt students to justify their thinking, not just tell the answer.
- In a small group game, students might draw cards with equations like 15 = ____ + 9 or 12 - ___ = 6. They can then use a variety of tools and strategies to make both sides of the equation equal.
- The teacher might share a story problem such as: “During a community feast, there were 14 loaves of bread made in the morning. After the dinner, there were only three loves left. How many were eaten?” Students might represent the situation as an equation and reason to find and justify their answer.

IEFA Integration Example: Traditional Stories – Inktomi

Context and Connection:

Minerva Allen (also known by the name *Sunk Pa*) was a respected A'aninin (Gros Ventre) and Nakoda/Nakona (Assiniboine) poet, linguist, storyteller, and elder who passed on in 2024. She often told stories of Inktomi (Iktomi) in her work, including her *Assiniboine Series*. In those works, Inktomi is not the Creator or Great Spirit but a being who shapes the world. Some cultures also tell stories of Inktomi as a trickster. In the Nakoda/Nakona (Assiniboine) creation story told by Minerva Allen, Inktomi helps form the Nakoda people and the land.

The story itself involves many numbers, that can support student connections between the story, and quantities, especially in the application of addition and subtraction. Given that many cultures have stories of the figure Inktomi, comparing those versions can help students develop an appreciation for cultural diversity and worldview.

Important note: In many Indigenous cultures, stories can carry sacred or timing protocols. Before sharing traditional creation stories, teachers may want to consult cultural committees of local Knowledge Keepers to ensure appropriateness. The Inktomi story as told by Minerva Allen has already been vetted and is appropriate to share with students at any time of the year.

Task Description:

The teacher should frame the lesson by sharing that many cultures and faiths have creation or origin stories and emphasizing that sharing these stories helps understand different cultural beliefs and worldviews. Teachers might invite an Elder or Knowledge Keeper to further discuss this, if appropriate, or may show a clip such as the beginning of the recording of Elder Duane Hollow Horn Bear's Lakota origin narrative to underscore that many people look to stories to understand the world.

Once students understand the intent of sharing the story, the teacher will tell the Nakoda creation story as told by Minerva Allen, will have a guest tell the story, or will utilize an alternative culturally vetted resource. After hearing the story, the teacher may pose mathematical questions from the story, having students write number sentences for each and determine the unknown. Examples may include:

- Inktomi made seven men and seven women. How many people did he create in total? (7 + 7 = ___)
- Inktomi made fourteen people. Seven of them were men. How many women did he make? (14 – 7 = ____ or 7 + ____ = 14)
- Inktomi called on eleven animals to search for mud to help him create land. He called on a muskrat, mink, beaver, and fisher to help, and also asked birds to help. How many birds did he ask? (4 + ___ = 11 or 11 – 4 = ____)
- The birds searched for seven days, and the other animals searched for four days. How many days in total did the search go on? (7 + 4 = ____)
- The animals searched for eleven days, but the birds only searched for seven. How many days did the muskrat, mink, beaver, and fisher search? (11 – 7 = ___ or 7 + ___ = 11)

Students might use manipulatives or drawings to represent these addition and subtraction situations. The teacher might also encourage students to show both the addition and subtraction methods for finding an unknown and compare strategies. If students need extra practice, additional math problems may be generated and evaluated. To extend learning, students might be encouraged to create their own story problem inspired by the narrative by having them pick a character in the story (e.g., Inktomi, the people, the animals, etc.) and invent a small problem involving three numbers where one number is unknown. They could then share their problem with classmates to solve, draw pictures to represent their problem, or create number sentences to represent the scenario they created.

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:

Transformation – Creating opportunities for students to engage with the traditional stories or oral histories allows students to consider the perspectives, traditions, and teachings of specific Tribes or Indigenous individuals, supporting connections to contemporary experiences and activating a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Montana Tribal Histories Interview – Minerva Allen and Inktomi Creation Story – OPI IEFA
- Biography: Minerva Allen: Educator, Linguist, Poet – Montana Historical Society
- Lakota Origin Story by Elder Duane Hollow Horn Bear – Wo Lakota Project

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** determine the unknown number in an addition or subtraction equation relating to three numbers without **intensive support**.
2. **Developing:** The student **can** determine the unknown number in an addition or subtraction equation relating to three numbers with **some support**.
3. **Proficient:** The student **can** determine the unknown number in an addition or subtraction equation relating to three numbers **with independence and accuracy**.

4. **Mastery:** The student **can** determine the unknown number in an addition or subtraction equation relating to three numbers **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.1.NBT.1

Flexibly count, read, write, and represent numbers to 120.

General Notes:

In this standard, students are expected to count, read, write, and represent numbers to 120 in flexible ways. In general, flexibility refers to a student's ability to choose and strategically use meaningful, creative, and innovative problem-solving strategies, relations, or mathematical representations based on the numbers or context involved (Hickendorff, et al., 2022).

- **Flexible counting** includes starting from different points (e.g., 73, 74, 75…), counting backward (e.g., 8, 7, 6…), or counting by multiples (e.g., 10, 20, 30…). In later grades, flexible counting strategies will become more expanded as students progress.
- **Flexibility in reading numbers** involves being able to recognize numbers presented in different formats, such as numerals (e.g., 84), words (e.g., "eighty-four"), or quantities (e.g., subitizing dot patterns or recognizing ten-frame groupings). Students begin to interpret and make meaning from numbers presented in multiple contexts and formats.
- **Flexibility in writing** requires the ability to represent numbers in multiple ways, such as numerals, written words, or through tactile/kinesthetic methods (e.g., "sky writing", sensory trays, finger tracing). While many Grade 1 students may no longer require the early tactile supports, they can remain appropriate for students who require intervention support or multisensory supplementation.
- **Flexibility in representing numbers** means using a variety of representations, such as visual, symbolic, verbal, contextual, or physical, to express numbers (NCTM, 2014). Students should begin to choose representations that best match the context or task.

The ability to flexibly engage in counting, reading, writing, and representing numbers supports deeper number sense and develops a strong foundation for future mathematical reasoning and problem solving.

Instructional Examples:

- The teacher might display a partially filled out hundreds chart and ask students to predict and fill in the missing numbers. The teacher can encourage students to verify their thinking multiple ways.

- Students might use base ten blocks to model numbers they draw from a deck (e.g., 83 or 106). They can record these numbers in standard form, expanded form, with words, or with manipulatives, or other methods.
- Using the context of a Homesteader Days or County Fair event, students might imagine helping organize an exhibit of farm animals or other entries. They might count and record items such as "56 goats" or "94 ribbons awarded." Students can practice writing the numbers, reading them aloud, and representing them with objects or tallies. The teacher might also ask questions such as "If you count by tens from 70 to 120, how many groups of ten will you pass?" as an extension to skip counting and efficient methods of counting.

IEFA Integration Example: Winter Counts

Context and Connection:

Winter counts were used by many plains tribes to record the history of important events, including the Niitsitapi/Amskapi Pikuni (Blackfeet), Tsitsistas (Cheyenne), Nakoda/Nakona (Assiniboine), Lakota, Dakota (Sioux). A winter count keeper was chosen by the community to mark the major events that happened each year from the first snowfall in one year, to the first snowfall in the next. These were initially recorded on rocks or walls, then eventually hides and paper (South Dakota PBS, n.d.). Today, the Lakota of the Cheyenne River Sioux Tribe in South Dakota keep this tradition alive through contemporary means – through the art of graffiti in their community.

The keeper used pictographs (symbols) to remember events and then used those symbols to share stories during oral tradition. These records are invaluable to preserving the histories, culture, and identities of communities and tribes. Some winter counts also include numbers or tallies to record quantities relevant to an event. This activity will draw on that tradition to help students practice counting, reading, writing, and representing numbers to 120.

Task Description:

The teacher might frontload this lesson with the Montana Historical Society K-3 Lesson on Winter Counts to build a baseline of student understanding. When transitioning to this math task, they may begin reviewing this information by showing pictures or videos of or about winter counts and ensure that students understand the following: (1) that winter counts are a tool for preserving the history of a community, (2) they were used by many Montana tribes including the Niitsitapi (Blackfeet), Tsitsistas (Cheyenne), Nakoda (Assiniboine), Dakota, and Lakota, (3) one person was typically chosen as the keeper of the winter count, (4) a winter count year runs from first snowfall of one year to the first snowfall of the next, and (5) the keeper records a pictograph for one important event each year and these records are shared orally across generations. These points serve as the basis for this activity.

The teacher will frame the task: "Because winter counts tell the story of a community, our class will tell the story of our class community for a time. We will record events that matter and use numbers to show how many. We will choose a class 'keeper of the record' to help us collect data, keep it safe, and tell our story. For the communities that made winter counts, being appointed as keeper was an honor, so make sure you choose someone

wisely." The teacher helps the class choose the keeper. The keeper might: help the teacher safely collect and store students' individual winter count papers during transition times, help distribute resources or materials, lead counting of tallies or pictures for class totals with teacher support, help write numerals on the collective class chart, label pictographs, help tell the class's oral history, etc.

Then the teacher asks students to suggest events to include. These events should have numbers so they can be counted and recorded. For example: How many books were read, number of field trips taken, holidays celebrated, etc. The class should pick three to five events to record.

Students will each create their own winter count on paper (or on a printed image of a hide), recording their own data for each of the events their classmates record (e.g., for the event "books read," student A may record three, student B may record six, etc.). For each event, they will: Draw tallies or pictures to show amounts, write the numeral, and write the word form if appropriate. They will also draw their own pictograph symbol for each event.

After individual work, the class works together to count the total tallies or pictures from all students for each event, representing these totals with pictographs and numerals, and develop an oral story that tells of the class's events over the period. The teacher might display this collective winter count where the wider school community can see it, or record students delivering oral histories of the events recorded.

Reflection questions might include: "Which event was easiest for you to count? Which was harder? Why?", "Did drawing tally marks or pictures help you understand the number better? How?", "Why is it important that everyone records the same events? What happens if someone misses counting or isn't counted at all?", "How does it feel to see the class totals? Did your number make a difference?", "How is telling our class's story like how the winter counts tell a community story?", "Why is it important to keep a record of what happened in the past?", "How can history be recorded?", 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 6.

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– Describing the specific experiences of Indigenous individuals, drawing connections between traditions associated with multiple Tribes, or including tribally specific resources would achieve the level of "additive." Alternatively, engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Native Hope – Winter Count, Then and Now – Video
- Smithsonian Institution – Lakota Winter Counts – Video
- Timothy S. Y. Lam Museum of Anthropology – Plains Indian Tries: Create a Winter Count
- Montana Historical Society – The Winter Count: Marking Time – Grades K-3
- South Dakota PBS – Winter Count Lesson Plans

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** flexibly count, read, write, and represent numbers to 120 without **intensive support**.
2. **Developing:** The student **can** flexibly count, read, write, **or** represent numbers to 120 with independence **or** can engage all skills with **some support**.
3. **Proficient:** The student **can** flexibly count, read, write, **and** represent numbers to 120 **with independence and accuracy**.
4. **Mastery:** The student **can** flexibly count, read, write, **and** represent numbers to 120 **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.1.NBT.2

Understand that ten is a unit composed of ten ones and that a two-digit number represents tens and ones.

General Notes:

This standard begins to introduce students to the structure of our base-ten number system by helping them recognize that ten ones make one ten and that two-digit numbers represent a combination of tens and ones. For example, students should understand that 47 composed of four tens (40) and seven ones instead of the digits 4 and 7 placed side by side (a common misconception in early grades). Students should know that "ten" is both a number and a unit and that two-digit numbers reflect quantities of ten and leftover ones. This helps set the base line for place value understanding and supports efficient computation with multi-digit numbers. These concepts can be supported with visual representations like base-ten blocks, ten frames, linking cubes, drawings, etc.

Instructional Examples:

- The teacher might show ten connecting cubes or straws and ask students "How many cubes are here?" students might count to ten and the teacher might bundle these with a rubber band saying, "This isn't just ten cubes (or straws), it is one ten," presenting them as a group. Students can continue grouping additional tens and leftover ones to build numbers like 34 (three tens and four ones).
- The teacher might give students a pile of single-linking cubes and ask them to count them. Once counted, the teacher might say, "Now, instead of separate cubes, lets connect them into one set of ten." The class can then discuss how the ten ones now represent one ten.
- The teacher might bring in a small basket of pinecones, leaves, or other items collected from the schoolyard. Students can count and group these items into bundles of ten and prepare for a class craft project. The teacher might ask, "How many tens and ones do we have?" and the students can record their thinking in many ways. Depending on student abilities, the teacher might also extend this to a discussion involving addition such as "if we found four more, how many tens and ones would we have then?" Students can explore how adding ones can create a new ten to reinforce the idea that ten ones make one unit of ten.

IEFA Integration Example: Tribal College Programs

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 workforce training, degree pathways, and serve as cultural and educational anchors for their communities through adult and community learning courses. At many Tribal colleges, students can study their heritage languages, traditional arts, and cultural histories alongside academic and professional subjects.

These colleges 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. By bringing together traditional and contemporary knowledge, they integrate culture, language, and traditions, conduct valuable research, and strengthen community identity, preserve heritage, and foster innovation for future generations.

A note on accuracy: Program listings change. For the most accurate information, consider checking each college's current website/catalog to confirm counts before instruction.

Task Description:

The teacher will begin by explaining the role of Tribal colleges as educational hubs that help people meet their learning and life goals. They will perhaps show pictures of a specific college with local relevance, show images from a catalog page listing degree requirements, or invite a representative of the college to join them in the classroom. They should make sure students understand that a person can earn a degree or certificate at a Tribal college that can help them with their career goals.

The teacher will then present the following information to students, perhaps including the school logos or location on a map to make it easier for students to understand.

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)
Number of Programs (Workforce Certificates, Undergraduate, and Graduate Degrees) (2025)	48	24	26	17	30	17	27

Note: Data was gathered during the 2025-2026 academic year from college websites and course catalogs.

Have students build each number using base ten blocks, bundles of straws, Unifix cubes, graph paper, ten frames, or any other age-appropriate manipulatives. Then, have students write how many tens and ones each number is composed of (e.g., 48 = 4 tens and 8 ones). Consider having students compare colleges with prompts such as: "Which college offers the most programs? How do you know?", "How many more does College A offer than College B?" (extension), "What would happen if we added one ten to this number?" (extension), etc.

Teachers could increase the engagement of this task by presenting the data with a slow reveal picture graph, connect to data standards by having students represent the information as a graphical representation, or engage cross-curricular integration by having students draw a picture of what they might learn at a Tribal or Community College, or a career they'd like to have some day.

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:

Additive or Transformation– Describing the offerings of a single Tribal college, drawing connections between requirements between multiple institutions, or including tribally specific resources would achieve the level of "additive." Alternatively, engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals, consider the benefits that Tribal colleges offer to communities, or draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- 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)

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** understand that ten is a unit composed of ten ones and that a two-digit number represents tens and ones without **intensive support**.
2. **Developing:** The student **can** understand that ten is a unit composed of ten ones **or** that a two-digit number represents tens and ones **or** can engage all skills with **some support**.
3. **Proficient:** The student **can** understand that ten is a unit composed of ten ones **and** that a two-digit number represents tens and ones **with independence and accuracy**.
4. **Mastery:** The student **can** understand that ten is a unit composed of ten ones **and** that a two-digit number represents 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.1.NBT.3

Compare two two-digit numbers using comparison symbols $>, =, and\ <$.

General Notes:

This standard asks students to draw comparisons between just two numbers with two digits (e.g., 56 and 34) using the symbols > (greater than), = (equal to), and < (less than) with accuracy. While students may begin reasoning about the size of numbers and drawing comparisons using informal language such as "56 is bigger than 34," proficiency in this standard means expressing comparisons using the correct mathematical symbols (e.g., 56 > 34). Students should be able to therefore connect each symbol to its corresponding vocabulary:

- > means "greater than"
- = means "equal to"
- < means "less than"

To support this connection, it is important for students to learn that mathematical comparisons are written and read from left to right, similar to the standard English written language. For example, the statement 56 > 34 is read as "fifty-six is greater than thirty-four." Students must also begin to understand that the symbols reflect a relationship between quantities and are not just shortcut notation. Using tools and strategies, such as place value and concrete visual aids can support learning and instruction. In first grade, students should draw comparisons between two numbers and two-digit numbers (e.g., 10 – 99). It is also important to note that a common introduction to this topic involves the use of the comparison of the inequality symbols to an "alligator" or "crocodile" that "eats the bigger number." While this can support beginning students in transitioning from pictorial to abstract thinking, students must be exposed to the actual vocabulary terms "greater than" and "less than" as showing a relationship to support long term success. Over reliance on the animal analogy can prevent student comprehension of the true meaning of the comparison statement, leading to misconceptions as students advance in their mathematical use of these symbols.

Instructional Examples:

- The teacher might write two numbers, such as 47 and 2 and ask, "Which number is greater, how do you know?" Students can use a variety of methods to justify their reasoning, including base-ten blocks, place-value charts, number lines, etc. They should be able to reason that 47 < 52 because 4 tens are less than 5 tens.
- Students might play a card game where each student draws two cards to make a number (for example, drawing a 6 and 8 might make 68). They can then compare these numbers with that of their partner and place a comparison symbol between them, then read it aloud. For

example, “68 is less than 72.” Students might also be able to use place value reasoning to create the largest number (e.g., 86) in order to beat the opponent.

- The teacher might introduce a story problem, such as “Two dog mushers are racing in the Race to the Sky in Lincoln, MT. One sled team traveled 47 miles, while another has gone 53 miles. Which team has traveled further along the trail?” Students might model the numbers with tens and ones, or use a number line, then write the inequality 47 < 53. The teacher can extend this with additional distances to track different sled teams’ progress through the trails.

IEFA Integration Example: The Prairie Turnip (Ma’s or Timpsina Ba’Gay)

Context and Connection:

The Prairie Turnip (Pediomelum Esculentum) is a tuberous root with blue-purple flowers that grows on plains lands stretching from Canada, through Montana, and down to Texas. In Montana, it can often be found in grasslands and sagebrush slopes, especially in the central and eastern regions. Plains tribes such as the Nakoda/Nakona (Assiniboine) and Niitsitapi/Amskapi Pikuni (Blackfeet) harvested this seasonally, typically around June. In Nakoda, it is *Timpsina Ba’Gay* and, to the Niitsitapi, it is called *Ma’s*. The Niitsitapi tell a story, “*The Girl Who Married a Star*,” which features *Ma’s* and teaches many lessons, including how Ma’s came to earth. In a video for OPI, Rodger White briefly shares that *Timpsina Ba’Gay* was braided and delivered to the earth by a woman who lived in the stars and missed her family. In this video, he also goes on to explain how the Nakoda harvest the Prairie Turnip mindfully by leaving seed tops, offering thanks to the earth (traditionally with natural tobacco), and ensuring that the land is “reset” after harvest. These practices highlight the values of reciprocity, responsibility to future generations, and care for the earth.

Important note: In many Indigenous cultures, stories can carry sacred or timing protocols. Before sharing traditional creation stories, teachers may want to consult cultural committees of local Knowledge Keepers to ensure appropriateness. The Niitsitapi story, “The Girl Who Married a Star” has already been vetted and is appropriate to share with students at any time of the year.

Task Description:

Students will listen to the Niitsitapi Star Story “*The Girl Who Married the Star.”* The teacher will call their attention to the significance of *Ma’s* / Prairie Turnip. The teacher will also clarify that people across several Tribes harvest this plant to this day, that harvesting is done mindfully, and that offerings are made in gratitude. Part of the OPI video, “Gathering Prairie Turnips” will be shown, or a local knowledge keeper will be invited in the classroom. If showing the video, the teacher should ensure students see the parts where Rodger White discusses how harvesters give thanks, leave some parts of the plant for future growth, and reset the earth, as these frame the context for the math activity.

For the math task, students will work with comparisons of two-digit numbers where one number represents the roots harvested and the other number represents the number of holes or seed tops replaced. The teacher should frame the context: “You have been invited to join a Nakoda family in

harvesting Prairie Turnips. Part of the harvest work is making sure that when we take turnips, we also refill the holes so plants can grow back. We need to check: Are the roots harvested equal to the holes refilled?"

Students will compare pairs of numbers using comparison symbols (>, =, <). For example: 27 roots harvested, and 20 holes refilled (e.g., 27 > 20), 62 vs 62 (62 = 62), 17 vs 22 (17 < 22), etc. Where appropriate, teachers might choose to extend by asking "How many more holes would need to be filled to match the number of roots harvested?" or "How many fewer roots than holes are there?"

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:

Additive or Transformation – With context relating to tribally specific practices, beliefs, traditions, or stories, depth and engagement might be engaged that would achieve the "additive" level. Connecting this task with reflections about the specific practices, traditions, and histories of sustainable and respectful harvesting practices from Knowledge Keepers, Elders, or drawing connections to contemporary experiences, activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Pediomelum Esculentum – Montana Field Guide
- Ma's the Prairie Turnip: Digging into the "Original Root" of Blackfeet Mythology – Montana Natural History Center
- The Girl Who Married a Star – OPI IEFA
- Gathering Prairie Turnips with Roger White – OPI IEFA

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** compare two two-digit numbers using comparison symbols >, =, and < without **intensive support**.
2. **Developing:** The student **can** compare two two-digit numbers using comparison symbols >, =, **or** <, **or** can engage all skills with **some support**.
3. **Proficient:** The student **can** compare two two-digit numbers using comparison symbols >, =, and < **with independence and accuracy**.
4. **Mastery:** The student **can** compare two two-digit numbers using comparison symbols >, =, and < **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.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.**

General Notes:

This standard contains two distinct components that collectively support the ultimate goal of building a foundation for addition within 100. Therefore, students must become proficient in both:

1. Adding a two-digit number and a one-digit number (e.g., 28 + 9)
2. Adding a multiple of ten and a two-digit number (e.g. 28 + 50)

Instruction should provide opportunities for students to explore these types of problems using any of the flexible strategies developed throughout grade 1. These may include:

- counting on or counting back (e.g., to solve 52 + 4, a student counts on “53, 54, 55, 56”)
- making ten (e.g., 28 + 9 implies 28 + 2 + 7 = 30 + 7 = 37)
- decomposing numbers (e.g., 28 = 20 + 8, so 28 + 50 = 20 + 50 + 8 = 70 + 8 = 78)
- using place value (e.g., to solve 34 + 50, a student separates by tens and ones (30 + 50) + (4 + 0) = 80 + 4 = 84
- applying properties of operations (e.g., a student uses the associative property to solve in tandem with another strategy, such as the example provided for decomposing numbers)
- or other known strategies.

Students may also utilize manipulatives and visual aids such as number lines, counters, ten frames, or diagrams to support their understanding and ability to accurately compute the sum. This standard presents a great opportunity for students to engage the mathematical practice of justifying and proving, by having the student explain their process and decision making.

Instructional Examples:

- The teacher might write 46 + 3 = ____ on the board and ask students "How can we add these numbers without counting starting at zero?" students might discuss a variety of methods or representations they can employ to determine the answer.
- Students might solve questions such as 52 + 20 using a variety of methods, such as ten blocks, ten frames, place value awareness, decomposing or composing numbers, etc. The teacher should emphasize that that when adding multiples of ten, the tens place changes while the ones place stays the same.
- The teacher might bring in a local context, such as a potato harvest and present a contextual problem. For example, "A farmer gathered 36 sacks of potatoes from one field and 40 sacks from another field. How many sacks did he harvest in total?" Students might employ a myriad of strategies and representations to determine that the farmer gathered 76 sacks of potatoes.

IEFA Integration Example: Beaded Dresses

Context and Connection:

The tradition of beadwork has persisted among the unique tribes of Montana for generations. The practice has endured despite challenges faced by these peoples, adapting to the materials available, popular items, and technological advancements. While historically, beadwork could be found on items like moccasins, bags, and jewelry, and these items are still produced to this day, you may also find beadwork featured on graduation caps, key lanyards, and basketball shoes. This shows the tenacity and resilience of Native peoples, as well as the versatility of this form of artwork. Though the list of mediums has been expanded, what remains consistent are the motifs and traditional design features unique to each tribe. While some techniques and styles have been shared among plains artists, certain design elements, stitches, and color combinations are unique to each Tribe.

For instance, Joyce, Juanita, and Jessa Rae Growing Thunder are three generations of Dakota (Sioux) and Nakoda/Nakona (Assiniboine) beadwork artists from Poplar, MT. In this task, students learn about their perspective and experiences, examine their artistry, and apply mathematical thinking to this context.

Task Description:

The teacher should play the recording of Joyce, Juanita, and Jessa Rae Growing Thunder speaking about their beadwork, the meaning behind their work, and their experiences growing up as multi-generational artists. They may also choose to summarize some of the information from the Smithsonian resource "A Life in Beads: The Stories a Plains Dress Can Tell," invite a local Indigenous Knowledge Keeper to the classroom to share their experiences, or read the story *What's in a Bead?* by Kelsey Borgford and Tessa Pizzale.

Once students have had exposure to the perspectives of Indigenous artists, they should examine images of the Give Away Horses dress provided in the resources. Focusing on the beadwork panels and patterns, the teacher should ask students questions such as: "What do you notice about the

beadwork?", "Do you see rows, lines, or repeating designs?", etc. The teacher should locate a section of the dress pattern, or another example of a pattern from a local Tribe, that appears to be a consistent row of beads. Then, the teacher can set up the problem by telling students, "Juanita and Jessa Rae learned how to bead from their grandmother, Joyce. Imagine you are beginning to learn how to design a dress pattern. One row is going to have 20 beads. Then, we want to add 7 more beads beside it for decoration. How many beads will that row have in total?" (20 + 7 = 27). Using numbers specific to a dress section would make this example more concrete for students. Other visual aids like ten frames, counters, beads, and drawings can also support this understanding.

The teacher may extend this learning by asking more questions where they must add two-digit and one-digit numbers, or where they need to add multiples of tens (e.g., "Another row currently has 35 beads, but we would like to add 10 beads to make the border wider. How many will that row have now?" (35 + 10 = 45), "If someone instead added 30 beads, (three tens), what would that be?" (35 + 30 = 65), etc.). Problems can be presented verbally at first, then they switch to different representations (e.g., number sentence, ten frames, number lines, etc.) once students begin to demonstrate baseline understanding.

To extend the activity to an artistic component, the teacher might provide students with a blank band or stripe template (rectangular) divided into bead positions (dots, small circles, or graph paper). They may ask students to design two bands using mathematical scenarios provided at the beginning of this task (e.g., 20 + 7, 35 + 10, 35 + 30, etc.). Opportunities for mathematical discourse might also be engaged by offering opportunities for students to share different strategies they used to solve the problems and allow students to make comparisons among classmates. Students might also engage in reflection, answering questions such as: "When we added 10 to 35, which digit changed? Which stayed the same?", "Which problem felt easier? Why?", "Why do you think beadwork artists might use rows and patterns instead of just picking random beads?", or "How does knowing bead counts help someone making a dress or other beaded design?", etc. Variations to this task might also include resources such as pattern strips or pony beads to bring designs to life.

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:

Additive or Transformation– Describing the specific experiences of Indigenous individuals, drawing connections between traditions associated with multiple Tribes, or including tribally specific resources would achieve the level of "additive." Alternatively, engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- National Museum of the American Indian – A Life in Beads: The Stories a Plains Dress can Tell – Smithsonian Museum
- Joyce, Juanita, and Jessa Rae Growing Thunder's Give Away Horses – Smithsonian Art Museum
- Minnesota PBS – What is the Difference between Dakota and Ojibwe Beadwork?

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** build a foundation for addition within 100 by: adding two-digit to one-digit numbers and adding multiples of 10 to two-digit numbers without **intensive support**.
2. **Developing:** The student **can** build a foundation for addition within 100 by: adding two-digit to one-digit numbers **or** by adding multiples of 10 to two-digit numbers or can engage all skills with **some support**.
3. **Proficient:** The student **can** build a foundation for addition within 100 by: adding two-digit to one-digit numbers **and** adding multiples of 10 to two-digit numbers **with independence and accuracy**.
4. **Mastery:** The student **can** build a foundation for addition within 100 by: adding two-digit to one-digit numbers **and** adding multiples of 10 to two-digit numbers **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.1.NBT.5

Using place value, given a two-digit number, find 10 more or 10 less than the number.

General Notes:

This standard supports the development of understanding place value by asking students to find ten more or ten less than a provided two-digit number (e.g., 10 to 99). For example, students may be asked questions such as “what is ten more than 46” (56) or “what is ten less than 78?” (68). This skill will support future work in adding and subtracting two-digit numbers as students begin to identify that increasing or decreasing by ten changes only the tens place unless the operation crosses a place value boundary.

Instruction should expose students to using concrete models (e.g., base-ten blocks or linking cubes), drawings or diagrams (quick tens and ones sketches), place value reasoning (e.g., “I have seven tens and eight ones, so if I take away one ten, I will have six tens and eight ones”), or number lines or hundreds charts as visual aids. Problems should be limited in grade 1 to those that result in positive whole numbers or zero. Students are not expected to be introduced to negative numbers at this grade level.

Instructional Examples:

- A teacher displays a number, such as 54, and asks, “What is ten more?” Students could use their awareness of place value, or other resources such as a hundreds chart, to move a row down and notice that only the tens digit changes. When the teacher asks, “What is ten less?” the student is able to utilize similar strategies to determine the answers and notice patterns.
- Students might use base-ten blocks to model a number like 78. They may then add one more ten stick to show 88, then remove one to make 68. The teacher might ask guiding questions such as “What changed?” or “What stayed the same?”
- The teacher might introduce a scenario with context such as “A Montana carpenter is building a fence and counts that 40 posts have been installed before lunchtime. After lunch, the carpenter adds a section of ten posts. How many are up now?” Students can apply reasoning and representation methods to determine and justify their answer. The teacher might then ask a follow up question, such as “The carpenter notices that ten of the posts installed by their apprentice weren’t done correctly and need to be removed. How many would be left?” Again, students might solve using a variety of methods and justifications of reasoning.

IEFA Integration Example: Native Trout Restoration

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 its native trout conservation while also providing locally sourced protein to the community and offering an affordable and sustainable option for shoppers over imported fish options (Native Fish Keepers, 2025). This task takes the context of this current initiative and applies it in ways that help students understand the concept of calculating ten more or less.

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 their increasing population has had to native trout species like Bull Trout and Cutthroat Trout. The teacher will explain that the Confederated Salish and Kootenai Tribes (CSKT), concerned about this, established an organization called Native Fish Keepers, Inc. to protect native fish populations. This organization manages the population and funds its efforts through the sale of Whitefish 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 will imagine they are helping with this conservation effort. The teacher will prepare a “catch tracker” chart. The chart will have several two-digit numbers that represent how many lake trout have been caught in different nets by different boats this week (e.g., 34, 47, 65, 79, 52, etc.). Then, the teacher calls out “ten more” or “ten less” instructions, one at a time. For example, “take 10 more than 48” or “10 less than 65.” Students will mark on their chart the new number. Laminated ten frames or tens blocks could support this work.

Students should compare their answers with a class display (e.g., whiteboards, projected screen, Desmos, etc.) that shows responses **anonymously**. There should be a discussion about strategies and tools used by the students to find the answers in a number-talk style discussion. For example, “I see a lot of you got ____, can anyone share a strategy they used?”, “Someone got ____ instead of ____... what might they have done?”, “What could they do differently?”, etc.

Students can also discuss questions like “Why did the tens digit change?”, “What stayed the same?” and the teacher can use base ten models or place-value visuals to support comprehension. As an extension, if students are comfortable, the teacher can have them imagine the lake trout catch goal for the year (143,000) and ask: “If one boat catches 10 fewer fish every day, over many days, how will that affect meeting this goal? How many “10 less” days would it take to drop by, say, 100 fish?” The teacher should keep these extension numbers simple for grade 1 and avoid four-digit numbers.

Reflection questions might include: “How does catching more Lake Trout help native Bull Trout in Flathead Lake? Why is it important?”, “Why do you think the CSKT tribes work so hard to reduce Lake Trout even though catching fish is hard work?”, “What is one thing you could do to protect native species in our 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 6.

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 specific practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates 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* – Children's Story authored by the Confederated Salish and Kootenai Tribes (CSKT)
- History of the Bull Trout – Confederated Salish and Kootenai Tribes (CSKT)

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to,** given a two-digit number, use place value to find 10 more or 10 less than the number without **intensive support**.
2. **Developing:** The student **can,** given a two-digit number, use place value to find 10 more or 10 less than the number with **some support**.
3. **Proficient:** The student **can,** given a two-digit number, use place value to find 10 more or 10 less than the number **with independence and accuracy**.
4. **Mastery:** The student **can,** given a two-digit number, use place value to find 10 more or 10 less than the 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.1.NBT.6

Subtract multiples of 10 from a two-digit number.

General Notes:

This standard extends understanding of place value through subtraction of multiples of ten (e.g., 10, 20, 30…) from a two-digit number (e.g., 10 to 99). For example, "What is 62 – 30?" (32). Students will once again use flexible strategies learned in first grade (e.g., place value, use number relationships, or decomposition) to evaluate these problems with accuracy. Instruction may involve place value strategies, visual models, drawings, or number lines. In alignment with grade level expectations, differences should be limited to those that result in positive whole numbers or zero since introducing negative results is not expected in Grade 1.

Instructional Examples:

- The teacher might present a problem such as 73 – 20 = ____ and ask students to visually represent what happens to the tens and ones. Students might use base-ten blocks to remove two tens rods from seven tens and three ones, leaving five tens and three ones (53).
- Students might use a hundreds chart to solve problems like 96 – 30 by moving up three rows and landing on 66.
- The teacher might present a contextual scenario, such as: "The Montana National Guard is testing communication devices. They start with 80 radios and send 30 to another base. How many are left?"
- Students might play a game in class called "Race to Zero" where students start at 100 on a number line or hundreds chart. They then take turns rolling a die with tens on each side (10, 20, 30…etc.). On each turn, the player subtracts the number they rolled from the current total (e.g., a student rolling 20 on their first attempt would write 100 – 20 = 80). Players record their equations as they go and the first player to reach zero wins.

IEFA Integration Example: Ribbon Skirts

Context and Connection:

Ribbon skirts are symbols of cultural identity, pride, and resilience for many Indigenous people across North America, including in Montana. Though ribbon skirts 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 the skirt vary in ways unique to each tribe, many traditions describe ribbon skirts 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 senior night, 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 wear their ribbon skirts during swearing in ceremonies. Many tribes have specific traditions, stories, and conventions surrounding ribbon skirts, 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 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:

The teacher will begin the activity by showing examples of ribbon skirts specific to a tribe or local community in the form of images, books, or videos. The teacher will explain the significance of these skirts, using resources such as the story, "What Your Ribbon Skirt Means to Me: Deb Haaland's Historic Inauguration" by Alexis Bunten (readings can often be found on YouTube), or interviews with Montana Indigenous women or girls (such as a local knowledge keeper, if appropriate). Emphasize that these skirts are symbols of identity and strength and that designs, stories, and traditions often vary by tribe. Bringing in a physical ribbon skirt for students to see, touch, and feel would elevate their ability to understand and engage with the context. Classrooms that do not have access to physical ribbon skirts to share with students might instead show pictures or ask community members to bring in examples.

The teacher will then set up the math challenge, using linking plastic cubes or a similar non-standard measurement tool as an aid. "You have been given several colors of ribbon to design your own ribbon skirt! Each skirt panel uses 30 linking cubes of ribbon. You want to make a skirt with two panels, so you'll 60 linking cubes of ribbon total. Let's figure out which colors you have enough of, and how much would be left over."

The teacher will display a chart of ribbon colors and lengths, similar to the one below:

Ribbon Color	Cube Length Available
Red	84
Orange	35
Yellow	100
Green	62
Blue	16
Purple	98

Students will determine which ribbons have enough length to be used for the skirt (60 cube lengths needed). For all the usable colors, subtract 60 from the total and record how much ribbon should be left. Then, have students choose which colors they would want to use for their ribbon skirt,

write number sentences, and explain their choices (e.g., “I used red and purple ribbon 84 – 60 = 24 and 98 – 60 = 38.”). The teacher might provide students with a ribbon skirt template or coloring page to show their design.

Teachers might ask reflection questions such as: “How did you decide which ribbons to use?”, “Why do you think ribbon skirts are important to some people?”, “Why do you think it is important to have the freedom to wear something meaningful?”, “Can you think of something you wear that shows something special to you?”

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 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 specific practices, beliefs, traditions, or stories, a slightly deeper depth and engagement might be engaged that would achieve the “additive” level. Engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the “transformation” level.

Relevant Resources:

- The Ribbon Skirt Project
- Story of the Ribbon Skirt – Seven Generations Educational Institute
- Ribbon Skirt Tutorial – Galt Museum

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** subtract multiples of 10 from a two-digit number without **intensive support**.
2. **Developing:** The student **can** subtract multiples of 10 from a two-digit number with **some support**.
3. **Proficient:** The student **can** subtract multiples of 10 from a two-digit number **with independence and accuracy**.
4. **Mastery:** The student **can** subtract multiples of 10 from a two-digit 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.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.

General Notes:

This standard includes two related but distinctive skills:

1. Ordering three objects by length, from shortest to longest, or, from longest to shortest based on direct comparison.
2. Comparing two objects indirectly by using a third object as a point of reference. For example, if object A is shorter than object C, and object B is longer than object C, students can infer that object A is therefore shorter than object B. This may not ever require a direct comparison of objects A and B (e.g., "An eraser is shorter than a pencil and a ruler is longer than a pencil, how does the length of an eraser compare to the length of a ruler?" Answer: the eraser is shorter than a ruler.)

This thinking begins to develop transitive and abstract thinking in students, which will become increasingly essential in future math concepts such as measurement, conversions, and algebraic reasoning. Importantly, this standard requires educators to integrate cultural contexts to make learning more meaningful and relevant to students and to help students understand length measurement in familiar or Montana-specific contexts.

Instructional Examples:

- The teacher might give students three classroom items (e.g., a pencil, a crayon, and a marker), asking students to line them up, side by side in order from shortest to longest. Then, the students will use one item, such as they crayon, to compare the two others indirectly. Students will form reasoning statements such as: "The pencil is longer than they crayon, and the crayon is longer than the marker, so the pencil is longer than the marker." Using sentence stems during such activities can be a powerful support mechanism for students who are still working to grasp sentence structure.
- The teacher might engage students in a contextual task, such as "Families in our community often go camping or fishing near the river (or lake). Let's imagine we found three fishing poles, one for a child, one for a parent, and one for a grandparent." The teacher might introduce indirect comparison statements such as "If the parent's pole is longer than the child's, and the grandparent's pole is longer than the parents, which one is the longest?"

IEFA Integration Example: Crow Language Animals

Context and Connection:

Indigenous languages are being revived among many communities through preservation programs across Montana. Despite historical barriers, Indigenous languages live on through immersion programs, tribal colleges, native language preservation programs, and the tenacity of native speakers. In this activity, students will gain some basic familiarity with one of these languages, Apsáalooke (Crow), is spoken by approximately 30% of tribal members. Students will learn Apsáalooke animal names and compare the animals by lengths in application of this standard. This activity was adapted from the activity "Crow Animals," written by Terry Lawton and Reva Littleowl-NotAfraid in the text "Creating A Sacred Place for Students in Mathematics." This task could be easily adapted to any of the languages spoken by Indigenous communities in Montana, and teachers are encouraged to work with language speakers and resources to increase the local relevancy of the task.

Task Description:

The teacher should provide images or models of any of the following animals, along with their Apsáalooke (Crow) language names:

Horse – iichiile	Mouse – iisuukaate	Cat – iishbiiwishke	Eagle – deaxkaashe
Wolf – cheetexiila	Cow – bisheeichiile	Rabbit – iisashpite	Duck – biaxaake
Dog – bishkakaashe	Coyote – buattee	Buffalo – bishee	

Teachers spend time sharing the relevance of language to communities across the globe, taking time to explain how important language is to cultural expression. The teacher may ask students what they imagine it would feel like not being able to use their language, how they think that would affect their daily lives, connection with others, and ability to do basic tasks. The teacher may add that Indigenous children were required to learn a new language – English – as part of their required schooling during the boarding school era. It may be developmentally inappropriate to dive any deeper into the policies and trauma that emerged from this era for this grade level, however, this brief, age-appropriate, explanation could build a foundation of familiarity as students progress in maturity and explore the topic in later grades. Alternatively, the teacher could simply express that students will experience what it is like to try to learn a new language, which is a practice many people engage in, for both practical and personal reasons.

The teacher will then explain that students will have an opportunity today to see what learning a new language can feel like – sometimes exciting, sometimes frustrating. We will use these words to compare the sizes of three different animals and try using the Apsáalooke (Crow) language. Because mastery of the language is not the focus, the teacher should provide scaffolded support like having the words printed or playing the recordings of the words during the activity. For the activity, the teacher will present three animals with pictures and Apsáalooke names. These pictures may need to vary in size to provide additional context for students to support their ability to reason.

For example:

- The iisuukaate (mouse) is shorter than the iichille (horse)
- The cheetexiila (wolf) is longer than the iisuukaate (mouse).
- So, without measuring directly, we can figure out that the cheetexiila (wolf) is shorter than the iichiile (horse).

Students may practice making these statements using both English and Apsáalooke words. They may say something like "The iisuukaate is shorter than the cheetexiila. The cheetexiila is shorter than the iichille. So, the iisuukaate is shorter than the iichille." This can also be adapted for linguistically diverse students by allowing them to make these statements using their heritage language and Crow language. The teacher should encourage students to repeat the comparisons aloud, reinforcing that they are learning how to both order by length and how to use a new set of language vocabulary in context.

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, 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 with a school event 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:

- Apsáalooke Dictionary Online (with pronunciation) – Crow Language Consortium
- Native Language Resources – MT OPI

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** order three objects by length and compare the lengths of two objects indirectly by using a third object without **intensive support**.
2. **Developing:** The student **can** order three objects by length **or** compare the lengths of two objects indirectly by using a third object with independence and accuracy **or** can engage in both skills with **some support**.

3. **Proficient:** The student **can** order three objects by length **and** compare the lengths of two objects indirectly by using a third object **with independence and accuracy**.
4. **Mastery:** The student **can** order three objects by length **and** compare the lengths of two objects indirectly by using a third object **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.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.

General Notes:

In this standard, students will begin to understand what it means to measure length. They learn to express the length of an object as a whole number, based on how many same-sized units it takes to span an object from end to end without gaps or overlaps (e.g., lining up same-sized paperclips end to end to measure the length of a pencil in units of paperclips and reporting the length as “four paperclips long”).

In grade 1, students work mostly with informal or non-standard units and familiar objects (e.g., paper clips, blocks, cubes, popsicle sticks, hands, string, etc.) during activities. Although standard units (e.g., inches, centimeters, feet, etc.) may be introduced during instruction for familiarity, they are not a requirement of proficiency because the emphasis is on developing conceptual fluency through hands-on activities with familiar informal units before progressing to formal standard units. Furthermore, students do not work with fractional parts of units, conversions between units, or formal tools like rulers and measuring tapes as part of standard expectations in first grade.

This standard provides an opportunity for students to attend to precision by being specific about the units they are using in their measurement (e.g., “four paperclips”) and teachers can prompt this accurate description by asking for clarification when students give a numerical answer lacking units. This practice strengthens students’ understanding that the meaning of a measurement depends on the unit used (e.g., Four paperclips and four baseball bats are not equivalent in length.)

Instructional Examples:

- The teacher may give students a strip of paper and a handful of same-sized paper clips. Students line up paper clips end-to-end in order to measure the strip and count how many are used. The teacher should emphasize that the clips must touch but not overlap and have students record their measurements.
- Students might explore measuring classroom items using any number of resources, such as connecting cubes, inch tiles, magnetic tiles, etc. They should record their findings on a chart and compare which objects are longer or shorter. The teacher might prompt reflection around the measurement items used by asking questions such as "If we use bigger cubes, will the number be the same? Why or why not?" They can also drive this home by having students use their feet to measure a single item and having students explore why some students counted less feet than others. This will help students understand the beginning concepts of unit measurement and the importance of measurement accuracy.
- The teacher might engage students in a "How We Measure Up" activity where the teacher takes students outside on a sunny day and invites them to trace their own outlines in chalk. The students then choose a nonstandard unit to measure themselves – such as leaves, crayons, pinecones, pebbles, etc. After measuring, students should create a small sign to display next to their outline statements such as: "I am as all as 26 leaves!" or "I am 40 crayons tall.", etc.) Photos of these outlines can be posted on display in the hallway or classroom. Alternatively, if going outdoors is not an option, students can trace themselves on butcher paper and display their real-life cutouts in the hallway.

IEFA Integration Example: Red River Carts

Context and Connection:

The Métis people, who traveled the northern prairies – including parts of Canada, North Dakota, Montana, and Minnesota – to trade, crafted hardy wagons called "Red River Carts." These carts were made entirely of materials that could be found easily on the plains – like wood, rope, and sinew – so they could be repaired easily on the trail without metal (Canadian Geographic, n.d.). There were no standardized measurements for these carts, but, according to the Canadian Geographic (n.d.), they were typically about 2 meters (~6.6 feet) long, one meter (~3.3 feet) high, and 84 centimeters (~2.8 feet) wide. The Métis used these carts for a multitude of purposes from harvesting goods, transporting trade and hunting materials, migrating to new locations, and as shelter from the weather and danger (Canadian Geographic, n.d). These carts were so vital to the Métis people that they are represented as symbols in many Métis communities and insignia, including on the logo for the Métis Nations of Alberta and British Columbia (Canadian Geographic, n.d.). This task takes inspiration from Chris LaTray's description of the Red River Carts in his book *Becoming Little Shell* as the cultural and environmental anchor for this activity.

Task Description:

Following a brief introduction to the Métis and their innovative Red River Cart using one of the resources provided below, the teacher should set the scenario: "Imagine you are journeying with a Métis family across Montana, and one side of the cart breaks. The measuring tools seem to be missing!

what natural items around you could help measure the broken piece so you can make a repair?" Students brainstorm natural, easily found items (e.g., their hands or feet, ponderosa pinecones, grass stems, or bark strips) that could be laid end to end without gaps or overlaps. If using items that are not the same size every time, students might need to discuss how they will overcome this barrier (e.g., cutting grass stems to be the same size).

Students will then choose one item and model the measurement. The teacher might lay out two-meter sticks, string, or a virtual model to represent the size of the broken part or use other forms of representation. The students will then line up their items to count how many items form the length of the broken side (e.g., "17 pinecones long"). Students might gather multiple forms of informal measurement to express the length in different ways, such as comparing the number of pinecones needed to number of hands, feet, or other manipulatives. The students should then reflect on the benefits and challenges of using these items as non-standard units of measurement. They also might discuss how the Métis choice to use materials that could be found with ease on the trail demonstrates ingenuity – it is not that they didn't have access to metal nails, gears, and oil – they simply chose not to use these. Students might reflect on the question "Why might the Métis have made this choice, and how does it show ingenuity (or cleverness)?"

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:

Additive or Transformation – 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. Engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Métis Red River Carts – Canadian Geographic
- The Métis and the Red River Ox Carts – PBS Documentary
- Métis Minute – Red River Carts – Métis National Council
- Buffalo Economy and Red River Carts 6th Grade Lesson – Resource Bank (pictures, readings, videos, etc.) – OPI IEFA

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** express the length of an object as a whole number of length units and does not yet understand that the measurement of an object is the number of same-size units that span it with no gaps or overlaps without **intensive support**.
2. **Developing:** The student **can** express the length of an object as a whole number of length units **or** understands that the measurement of an object is the number of same-size length units that span it with no gaps or overlaps with independence and accuracy or can engage in both skills with **some support**.
3. **Proficient:** The student **can** express the length of an object as a whole number of length units **and** understands that the measurement of an object is the number of same-size length units that span it with no gaps or overlaps **with independence and accuracy**.
4. **Mastery:** The student **can** express the length of an object as a whole number of length units **and** understands that the measurement of an object is the number of same-size length units that span it with no gaps or overlaps **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.1.MD.3

Tell and write time in hours and half-hours using analog and digital clocks.

General Notes:

This standard provides exposure to an important life skill for students – measurement of time. Students will be expected to tell and write time in hours and half hours whether they are provided with an analog or digital representation of time.

Students should be able to:

- Read and interpret analog clocks (e.g., understand that when the minute hand is on the 6 and the hour hand is halfway between 4 and 5 it is 4:30 or half past four).
- Read digital clocks that display times like 4:00 or 4:30.
- Express time in multiple formats such as verbal (e.g., “four thirty” or “half past four”) or written (e.g., “4:30 or “four thirty”).

Instruction at this stage helps students distinguish between the hour and minute hand, recognize that the minute hand pointing to six represents 30 minutes past the hour, and understand that hour hand will lie between two numbers at a half hour increment.

While assessment tasks measuring proficiency should remain within the bounds of this standard (e.g., hours and half hours), students who demonstrate proficiency may benefit from enrichment that explores related reasoning with other partial time measurements like quarter hours to expand understanding, demonstrate mastery, and prepare for future grade-level expectations.

Instructional Examples:

- The teacher might introduce an analog clock and explain the purpose of each hand. Students then practice setting the clock to full hours and reading them aloud, then switch to half-hours. Students should record both analog and digital forms. These times could be connected to specific events that occur at different times of the day. For example, if lunch is served at 11:30, students might record what this time looks like written out, and what it looks like represented on an analog clock.
- During a classroom routine, students might read the time together throughout the day. The teacher might ask questions such as: "It's 8:30, what happens at 9:00?", or "The end of the school day is 3:00, how much longer until then?" This can be supported by having pictures of the routine set up in the classroom for students to reference.

IEFA Integration Example: Powwow Schedule

Context and Connection:

Before clocks became the primary method of telling and recording time, Indigenous Peoples across the globe developed unique ways of understanding it. The Tribal cultures that resided in what is now Montana often understood time through natural cycles such as the seasons, sun, and task orientation (e.g., the task is completed when finished, rather than when a clock says time is up.) Modern life, including organizing major community events requires adherence to a clock.

At times in history, the concept of "Indian Time" has varied in level of importance. Yet many Indigenous cultures and individuals possess a world view on time that differs from the colonial-clock-centric view of the United States. For example, within the Lakota (Sioux) worldview, Elders such as Albert White Hat Sr and Duane Hollow Horn Bear emphasize "readiness" at spiritual, physical, psychological, or natural levels, as opposed to the time shown on a clock. The following task invites students to listen to these perspectives and then connect them to the contemporary context of planning a Powwow schedule.

Task Description:

The teacher might begin the lesson by asking students to think about time, prompting them to consider questions such as: "Are there ever situations where the clock tells us it is time to do something, but we don't feel ready to do it?" Students might generate responses like "My bedtime is 8 o' clock but I'm never tired!" or "Sometimes it's time to go back inside but I am not ready to stop playing." etc. The teacher can explain that Lakota people sometimes think about time as readiness rather than just what a clock says. The teacher should show the video of Duane Hollow Horn Bear if

possible, or, have a knowledge keeper from the community join the class to discuss their perspectives on time to increase local relevancy.

Students should have an opportunity to reflect on this video, by considering questions such as: “Why might someone not feel ready even if it is the right time according to the clock?”, “Talk about a time when the clock said you should do something, but you didn’t feel ready. What happened?”, “Why do you think Lakota Elders talk about ‘readiness’ instead of always following the clock?”, “How is the Lakota perspective different from how we plan things in our lives, like when school starts?” “What do you think the world would look or be like if we didn’t do things when the clock said we should?”, etc.

This final question can serve as a transition to the clock-telling task. The teacher can explain that there are times in our society when having a schedule based on a clock can be tremendously helpful. They will give an example of a large community event and ask students to consider events that happen in their community where time is an important factor. The teacher might ask “Why is setting a clock-based time for an event to start helpful to members of the community?”

The teacher might transition to the importance of clock-base scheduling in community events, introducing a real local Powwow schedule. Using this schedule, students can engage in clock-time tasks such as:

- Draw hands on an analog clock to show the time Grand Entry begins.
- If the Flag Raising Ceremony is scheduled for eight o’clock (8:00), write the time you would see on a digital clock.
- If the Afternoon Grand Entry is at one o’clock (1:00), express this time on the analog clock.
- A dancer looks at the clock and sees the hour hand is halfway between ten and eleven, and the minute hand is on the six. What time is it?
- If the tiny tots category begins at noon (12:00) and usually lasts half an hour, what time will be shown on the analog and digital clock after it is over?

To connect the Lakota (or local perspective) concept of readiness to the context of the Powwow schedule, a teacher might ask students to imagine they are helping plan the event. Have them pick one activity on the schedule and create a short plan including: What time the event will start (clock time) and how they know participants are ready (physical, emotional, or task-oriented readiness) before beginning. They will also consider questions such as “What would happen if the event started at a clock time, but people weren’t ready? What would happen if we waited until everyone was ready, but the clock said they were late?”

The teacher might encourage students to write, draw, or share their ideas about both the clock and readiness and can help make events meaningful and respectful to everyone.

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:

Additive or Transformation – 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. Engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Lakota Time by Elder Duane Hollow Horn Bear – Wo Lakota Project
- The Real Meaning of Indian Time – Tribal College Journal
- Decolonizing Time Regimes: Lakota Conceptions of Work, Economy, and Society – American Anthropologist

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** tell and write time in hours and half-hours using analog and digital clocks without **intensive support**.
2. **Developing:** The student **can** tell **or** write time in hours **or** half-hours using analog **or** digital with independence and accuracy **or** can engage in all skills with **some support**.
3. **Proficient:** The student **can** tell **and** write time in hours **and** half-hours using analog **and** digital **with independence and accuracy**.
4. **Mastery:** The student **can** tell **and** write time in hours **and** half-hours using analog **and** digital **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.1.MD.4

Identify the value of coins.

General Notes:

Students will begin to identify U.S. coins and state their values. Specifically, students will know that the penny is worth one cent, a nickel is worth five cents, the dime worth ten cents, and a quarter is equal to 25 cents. Instruction may include opportunities for students to examine the physical characteristics of each coin to help with distinguishing values. For example, students often confuse nickels and dimes because of their size, so explicit attention to this is helpful.

Students who demonstrate proficiency in this standard may benefit from opportunities to engage their understanding of the values of coins in connection with other standards such as addition and subtraction, equivalency concepts, measurement, etc., to expand understanding, demonstrate mastery, and prepare for future grade-level expectations.

Instructional Examples:

- The teacher might introduce plastic coins such as pennies, nickels, dimes, and quarters. They may then discuss each coin's appearance, name, and value with students. Students sort these into groups, practice naming them aloud, and connecting their values to quantities. They may even connect quantities between coins (e.g., ten pennies = one dime).
- Students might play a coin match game where they must draw coins with different values and match them to pictures, real, or replica coins. The teacher might prompt: "Can you show 15 cents using more than one combination?"
- The teacher might have set up a pretend store in the classroom where students take turns being shoppers and cashiers using play food, baskets, and coins. A student might "buy" an item and count out the correct coins. Another student might act as the cashier and check to verify the amount is correct.

IEFA Integration Example: Powwow

Context and Connection:

In many Indigenous cultures, reciprocity is a core value that means not just reciprocating physical gifts, but honoring the gifts of knowledge, performance, community, and culture shared among people. Powwows provide many examples of this value in action, and one way this is shown is by placing money at the feet of dancers as a sign of respect and honor for their performance or spiritual offering. The dancer then dances over the money to acknowledge the gift, and that money may be picked up later by an arena director and given to an elder or someone in need.

Task Description:

Students will begin by viewing a video or pictures from a local or Montana powwow. The teacher may also include a short, age-appropriate story that highlights the significance of powwows, such as *Jingle Dancer* by Cynthia Leitich Smith, *Powwow Day* by Traci Sorell, or *Bowwow Powwow* by Brenda J. Child. The teacher will explain, in age-appropriate ways, that many Indigenous dances and ceremonies were once banned under laws like the Code of Indian Offenses, but that traditions are being brought back and celebrated today. The teacher will share that sometimes, people place money at the feet of dances to honor them and may ask students why they believe people might do this, then share a simple explanation: that it is a way to show respect and to say thank you. The teacher might have also asked students to reflect on how it might feel to have something they loved doing with family or friends made illegal for many years.

After this introduction, students will pretend they are helping an arena director at the powwow. The teacher will provide real, replica, or picture coins arranged in different groups at several dancers' feet. Students count how many of each coin there are (e.g., pennies, nickels, dimes, quarters) and determine the values of the coins in these groups (e.g., "There are three dimes that equal ten cents each"). Some students may be able to determine totals by coin type (e.g., "Three dimes are equal to 30 cents"), depending on the number of coins, the time of year, and level of mastery of other content standards. The teacher might also include dollar coins if students have familiarity.

To reflect, students may consider responses to the following questions: "How did you figure out how much each coin was worth?", "Why do you think honoring someone is important?", "What are other ways you could honor someone for sharing their gifts with you?", "What does it mean to bring back something people weren't allowed to do for a long time?", and so on.

Finally, students can be prompted to consider a non-tangible gift someone in their life has given them recently (e.g., shared knowledge, kindness, encouragement, help, or a story someone told them). They will then consider how they would like to thank that person. Alternatively, they can think of one small thing they could do to help keep traditions alive or honor someone who shares culture in their community (e.g., telling a story, making a drawing or thank you card, helping at a cultural event, or simply listening and learning). Some guiding questions might be: "What is something kind someone did for you that wasn't a thing you can hold?", "How can you show you are thankful?", "What is one part of your culture, like a special holiday, celebration, story, or a family tradition you like, and how can you help make sure it isn't forgotten?", 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 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:

Transformation, or Social Action –Engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level. There is also a possibility of reaching the "social action" level of the multicultural framework through the exploration of themes like "reciprocity" and retention of culture through the context of reflecting on non-tangible gifts and preservation of traditions in families and communities.

Relevant Resources:

- Your guide to Understanding and Enjoying Pow Wows – OPI IEFA
- Songs from the Indian Reading Series (Specifically "The Dance of Life", Page 13) – OPI IEFA

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** identify the value of coins without **intensive support**.
2. **Developing:** The student **can** identify the value of coins with **some support**.
3. **Proficient:** The student **can** identify the value of coins **with independence and accuracy**.
4. **Mastery:** The student **can** identify the value of coins **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.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.**

General Notes:

This standard serves as the foundation for data literacy by engaging them in organizing, representing and interpreting data within up to three categories. A category refers to a non-numerical trait used for sorting or comparing (e.g., favorite color, type of pet, preferred sport.). This standard contains three distinctive components that students must become proficient in to attain proficiency in the entire standard:

1. Ask and answer questions about the total number of data points. For example, after surveying favorite sports in the class, a student might be able to create a data-driven question about the survey such as “How many students preferred football?” or answer a question posed by the teacher using the data, such as “How many students liked football the most?”
2. Identify how many are in each category. For example, given a data set with categories like football, basketball, and golf, students should be able to state the number of responses in each category.
3. Analyze the differences between categories. For example, students may compare data points across categories, making statements such as “three more students liked basketball over golf” or may draw simple conclusions from the data such as “We should plan more basketball time at recess because more students like it.”

Though this standard does not require students to create complex graphs, instruction might incorporate simple representations such as tally charts, bar charts or pictographs to help students visualize data, though the total number may be provided to the student. Representations should be straightforward, used as a visual aid, and focused on supporting comparative reasoning and number sense instead of interpreting the representations itself.

Instructional Examples:

- The teacher asks students a contextual question such as: “What is your favorite recess activity – swings, slides, or tag?” Students will raise their hands, and the teacher will tally responses on the board. Together, the class might create a picture graph or bar graph with each category labeled and the number of students who chose each represented. The teacher should guide the discussion with questions such as: “Which activity has the most votes?”, “Which has the fewest votes?”, “How many more students like swings than slides?”, etc.

- Students might collect data in small groups by surveying classmates about topics such as favorite classroom pets or types of fruit. They will record data using tallies or simple bar graphs and interpret their results in developmentally appropriate ways (e.g., “There are eight who chose apples, five who chose bananas, and three who chose oranges.”).
- The teacher might introduce a class survey titled “Who Do You Cheer For?” featuring popular college teams such as the University of Montana Grizzlies, Montana State University Bobcats, Montana Tech Orediggers, UM Western Bulldogs, etc. The teacher might present these pictorially with their mascots and ask student to place a sticker or mark under their favorite team. Then, the class might represent the results using a pictograph or bar graph. The teacher might model how to label categories, count votes, and record totals. Then, the teacher might lead a discussion to help the class interpret the data. This could also be engaged as a slow reveal graph where the school staff is polled, and the teacher slowly reveals details of the graph to get students comfortable with interpreting results. (For more information, research slow reveal graphs).

IEFA Integration Example: Wildlife Watch

Context and Connection:

Seven Tribal Nations Fish and Game Departments operate in Montana: The Blackfeet, Chippewa Cree, Confederated Salish & Kootenai, Crow, Northern Cheyenne, and the Fort Peck and Fort Belknap Tribes (Montana, 2014). These organizations work to enforce fish and wildlife laws, manage natural resources and animal populations, and educate the public. In its five-year (2021 – 2026) conservation plan, the Fort Belknap Fish and Wildlife has identified multiple species as being key to the ecosystem. These species have been identified for protection because of their relation to the social, economic, and cultural well-being of the Aaniiih and Nakoda people and for the sustainability and restoration of habitats and wildlife populations. This task asks students to imagine they are observing wildlife and reporting their observations to the Fish and Wildlife department and could easily be adapted to increase local relevancy by engaging conservation plans or Fish and Wildlife experts or scientists from any of Montana’s Tribal Nations.

Task Description:

The teacher will introduce the big idea: “Many Tribal Nations within Montana manage wildlife populations and land. The Fort Belknap Fish and Wildlife Department has created a plan for keeping an eye on certain animal species to make sure the population stays healthy. These animals include certain bird species, prairie dogs, black-footed ferrets, swift foxes, pronghorn antelope, deer, elk, bighorn sheep, and moose. They also monitor bison populations through the Buffalo Management Program. Scientists keep track of these animals by counting what they see in a habitat. Today, we will imagine we are helping by counting and recording what we ‘see’.”

The teacher should then provide pictures of three species (e.g., swift foxes, pronghorn antelope, and prairie dogs). They may hide these around the room or along a hallway or track to mimic a short “nature walk.” Students should record what they ‘see’ in a simple field journal using tally marks and labels.

Back in class, the teacher should work with students to build a table through prompting such as “How many foxes did you count?” and record responses students share. For example:

Animal	Swift Foxes	Pronghorn Antelope	Prairie Dogs
Number of Animals Observed	3 foxes	12 antelope	26 prairie dogs
Translations	Swift Foxes	Pronghorn Antelope	Prairie Dogs
Aaniiih/Gros Ventre Source: Fort Belknap Language Preservation Program, Aaniih Dictionary.	noouh-eh̲	noosityehi	beeθ-oniiih
Nakoda/Assiniboine Source: Indiana University, Assiniboine Dictionary	tʿokʿána	tʿatʿókana	bistʿą́ka

Suggested Activities:

1. Build visual representations. For example:
    - Bar Graphs: Students place cubes or stickers to match the total.
    - Picture Graphs: Use one picture icon per animal with a consistent scale.
    - Graph Paper: Have students fill in one square per student enrolled to visualize totals.
    - Cubes or Counters: Have students build piles of objects to match each category.
2. Ask and Answer Questions:
    - Use Notice/Wonder and a slow-reveal graph (reveal one category at a time, invite predictions, then reveal the rest).
    - Student-friendly stems:
        - “How many antelope did we see?”
        - “Which animal had the most / least?”
        - “How many more prairie dogs than foxes did we see?”
        - “I see that __ has more because __.”
    - Encourage concrete comparison with counters for bigger differences (e.g., 26 – 3).
3. Analyze Differences
    - Support student understanding comparison by posing prompts such as: “Let’s count how many more antelope were observed than foxes.” then using pairing strategies to visualize the difference. If the difference is greater than 20, ensure there are manipulatives or greater teacher scaffolding rather than formal equations.
4. Wrap up Activity:

- Read a brief excerpt from a tribally vetted story connected to plains ecology—such as *Inkdómi (Iktomi) and the Buffalo* or *How the Summer Season Came* from the Indian Reading Series. Then connect the story to your graph:
  - "What lesson from the story fits why communities count and care for animals?"
  - "In the summer story, the land changes with the season. When might we see more or fewer of our animals, and why?"
- Students create a quick three-panel story strip:
  - Where we looked and which animals we tracked.
  - A picture/bar graph showing their counts.
  - One sentence about what they learned (e.g., "We watch animals so they stay healthy," or "Seasons change what we see, so we count again later").

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:

Transformation, or Social Action –Engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level. There is also a possibility of reaching the "social action" level of the multicultural framework through the display of learning in the wrap up activity and link to caring for animal populations.

Relevant Resources:

- Inkdomi and the Buffalo – Indian Reading Series, Education Northwest
- How the Summer Season Came – Indian Reading Series, Education Northwest
- Five-Year Conservation Plan – Fort Belknap Indian Community Fish and Wildlife Department
- Montana Field Guide
- Wildlife and Habitat Junior Ranger Workbook – Bureau of Land Management

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** 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 without **intensive support**.
2. **Developing:** The student **can** organize, represent, **or** interpret data with up to three categories by: asking **or** answering questions about the total number of data points, identifying how many are in each category, **or** analyzing differences between categories with independence and accuracy **or** can engage all skills with **some support**.
3. **Proficient:** The student **can** 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 **with independence and accuracy**.
4. **Mastery:** The student **can** 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 **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.1.G.1

Distinguish between defining attributes versus nondefining attributes.

General Notes:

This standard requires students to understand the definition of a defining and nondefining attribute (in developmentally appropriate ways). A defining attribute is a characteristic that determines what kind of shape it is. Examples include the number of sides, the length of sides in relation to others, the number of angles, and whether the figure is closed (meaning all sides connect) or open (meaning there is a gap or break between sides). A nondefining attribute, on the other hand, does not change the type of shape. Examples include color, the way the shape is rotated or flipped, or the overall size of the shape. Students should be able to use these understandings to tell whether an attribute will change the kind of shape a figure is. This supports their ability to identify shapes as the same regardless of their size, color, or the way they are turned on the page. This understanding helps students develop precision and reasoning skills and builds a base for classifying shapes, comparing geometric properties, and understanding that mathematical definitions depend on specific criteria, not appearance or presentation.

Instructional Examples:

- The teacher might display a set of a single shape, such as rectangles, that vary in color, size, and orientation. Students then discuss what makes them all rectangles, using developmentally appropriate language such as “They all have four straight sides and four right angles.” The teacher should reinforce that the number of sides and types of angles are defining attributes, while color, size, and orientation are nondefining attributes. These change how the rectangle looks, but not what shape it is.
- Students might engage in a “Shape Detective” activity where each student receives a bag of cut out groups. They must then sort these shapes into groups based on type of shape, using clues. After sorting, the class should reflect on which features determined the group (defining) and which did not (nondefining).
- The teacher might present pictures of local or classroom items (such as a stop sign, a door, a window, etc.) and ask students to describe the shapes. Students might identify the defining and nondefining attributes of these shapes.
- The teacher might present the students with a “Which One Doesn’t Belong?” task displaying four shapes with shared defining or nondefining attributes, such as a red rectangle, a blue rectangle, a red smaller rectangle, and a red trapezoid. The students might then form arguments for which shape doesn’t belong. Some students might say the blue rectangle (because of its color; a non-defining attribute), others might say the small red rectangle (because of the size; a non-defining attribute), others still may say the trapezoid (the internal angles; defining attribute). The teacher might discuss with the class which shape is not a rectangle (the trapezoid).

IEFA Integration Example: Contemporary Artwork

Context and Connection:

Indigenous artistry is often showcased as historical artifacts, but Native American creative expression is very much alive today in ways unique to each artist, their culture, experiences, and expressive style. Examples of modern artwork can be found across multiple mediums such as traditional regalia, murals, fine art, and contemporary beadwork. Artwork by Montana Indigenous Peoples can be found at local venues such as museums, heritage centers, or Tribal colleges or online via digital databases or exhibits. By examining contemporary pieces by artists like David Dragonfly (Blackfeet-Assiniboine), Molly Murphy Adams (Oglala, Lakota), or Jaune Quick-to-See Smith (Salish-Kootenai, Metis-Cree, Shoshone-Bannock), students can connect geometric shapes to living Indigenous art.

Task Description:

Students begin by learning key vocabulary: defining attributes (essential properties like the number of sides, angles, closed shapes, etc.) versus nondefining attributes (features like color, size, orientation). The class then views selected contemporary Indigenous works such as David Dragonfly's *Painted Horses, Painted Tipis,* Molly Murphy-Adams' *Lizard Spine-Green, or* Jaune Quick-to-See Smith's *Eye Candy,* through images or field trips. As a whole class, launch the discussion with one artwork. During the discussion, ask students to identify geometric features (e.g., 3 sides (triangles), symmetry, etc.) and nondefining attributes (e.g., color variation, orientation, etc.). Next, in small groups, students analyze another chosen piece, taking time to document and categorize the attributes they notice.

Students might also discuss questions like "What shapes repeat here?", "How do colors influence mood or message?", "What do you think the artist is trying to say?", "What type of art do you enjoy?", "How can we use art to tell our personal stories?", "If you could write a short message to one of the artists whose work you reviewed, what would you say to that person and why?", etc. The activity can conclude with a gallery walk or group discussions during which students share their mathematical observations and personal interpretations of cultural meaning.

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 Tribes or Individuals, this task would achieve the "contributions" level. With context relating to tribally or individually specific artwork, a slightly deeper depth and engagement might be engaged that would achieve the

"additive" level. Connecting this task with the specific practices or artistic expressions with reflection questions that help students to draw connections to contemporary experiences, personal expressions, or Indigenous perspectives activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Contemporary American Indian Art – Missoula Art Museum
- Contemporary Indigenous Artists of Montana – OPI IEFA

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** distinguish between defining attributes versus nondefining attributes without **intensive support**.
2. **Developing:** The student **can** distinguish between defining attributes versus nondefining attributes with **some support**.
3. **Proficient:** The student **can** distinguish between defining attributes versus nondefining attributes **with independence and accuracy**.
4. **Mastery:** The student **can** distinguish between defining attributes versus nondefining 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.1.G.2

Build and draw shapes to possess defining attributes.

General Notes:

The focus of this standard is to help students build and draw shapes that match specific defining attributes. Defining attributes are characteristics that determine what kind of shape it is. Examples include the number of sides, the length of sides in relation to others, the number of angles, and whether the figure is closed (meaning: all sides connect) or open (meaning there is a gap or break between sides).

When given a description with specific attributes, students should be able to create a shape using drawing tools (e.g., pencil, whiteboard, digital drawing pad) or building materials (e.g., sticks and modeling clay, pattern blocks, or virtual tools). In first grade, students will typically learn to build and draw shapes such as circles, rectangles, squares, triangles, and line segments. Some students may also be able to represent additional shapes that are familiar to them, like hearts, stars, or octagons (like a stop sign), but these are not required for first grade. This core understanding supports early geometric reasoning and prepares students for more complex classification and analysis of shapes in later grades (e.g., identifying triangle types and skewed (oblique) vs. right three-dimensional objects).

Instructional Examples:

- The teacher might provide students with hands-on materials such as craft-sticks, straws, yarn, or clay. Students are challenged to build specific shapes. The teacher might provide prompts such as “I am thinking of a shape with three sides. Can you build or draw it?”
- The teacher might ask students to re-create shapes that are contextually familiar to them (e.g., a stop sign, a door, a window, etc.) and provide resources such as building or drawing materials. The teacher might also ask students to state which defining attributes helped them build or draw the shape.
- A carousel activity might be engaged where students build and draw shapes that demonstrate defining attributes. The teacher might create four or five stations each with real and local examples of shapes (e.g., a stop sign (octagon); a window (rectangle or square); a tent frame (triangle); clock (circle); yield sign (triangle)). Each station should include a photo or word, building materials, and recording sheets with prompts. Students then can rotate through each station by completing observation and describing tasks, building and drawing tasks, and reflection and discussion tasks.

IEFA Integration Example: Contemporary Artwork

Context and Connection:

Terran Last Gun, an enrolled member of the Niitsitapi/Amskapi Pikuni (Blackfeet) Nation of Montana is a visual artist known for his colorful renditions of geometric designs. As an artist, he shares that his influences include Blackfeet heritage, hides, war shirts, archeology, pictographs, and more (Terran Last Gun, 2025). His art aims to bridge ancient and contemporary artforms through a variety of mediums (Terran Last Gun, 2025).

Task Description:

Students will begin by exploring 2-3 selected images from Terran Last Gun's work. During this exploration, they will identify repeating patterns or shapes and express the defining attributes that make each shape special (e.g., "Circles are curved with no corners.", "Triangles have straight sides and three angles.", etc.).

The teacher will then provide students with a list of descriptions and attributes they can choose from (e.g., "A shape with three straight lines and three angles", "A shape with four straight equal sizes and four equal angles", etc.). Students will select the description they want to work with. They will create artwork that displays this shape. Drawing inspiration from Terran Last Gun, students should have the opportunity to create expressions using various supplies (e.g., paper, paint, cut out shapes, magazines, etc.) – if they meet their defining attributes of the shape the student selected.

To extend this activity, students might combine multiple shapes to mimic Last Gun's layered compositions. The teacher may also ask reflection questions such as "How did ensuring each shape had the right number of sides or angles help your drawing look like Last Gun's art?", "How is your art unique to you?", "Last Gun's art is usually meant to be a statement about the world around him. If the art you created could speak or tell a story, what would it say?"

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:

Transformation– Engaging resources and reflection questions that allow students to consider the artistic expressions of Terran Last Gun, how his art is inspired by his culture, or draw connections to contemporary experiences and applications through reflection activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Terran Last Gun – Piikani Visual Artist
- Land/Sky Featuring Terran Last Gun – Department of the Interior Online Viewing Room
- Terran Last Gun: Pattern, Noun 1: A Repeated Decorative Design – Creative Mornings HQ
- Terran Last Gun: Future Cosmic Energy – Missoula Art Museum

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** build and draw shapes to possess defining attributes without **intensive support**.
2. **Developing:** The student **can** build **or** draw shapes to possess defining attributes with independence and accuracy **or** can engage both skills with **some support**.
3. **Proficient:** The student **can** build **and** draw shapes to possess defining attributes **with independence and accuracy**.
4. **Mastery:** The student **can** build **and** draw shapes to possess defining 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.1.G.3

Compose new shapes using two- and three-dimensional shapes.

General Notes:

In this standard, students are encouraged to use both two-dimensional (2D) and three-dimensional (3D) shapes to build or create new shapes. Two-dimensional shapes are flat and have only length and height (sometimes called width), but no depth. In first grade, students typically work with shapes like circles, rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles. Three-dimensional shapes, sometimes called "solid shapes" have length, width, and height and take up space. First grade students are expected to work with shapes like cubes, right rectangular prisms, right circular cones, and right circular cylinders. Teachers may also introduce additional shapes (like stars or pyramids) when appropriate for student understanding, often as enrichment or as contextually appropriate. Through this standard, students begin to recognize how shapes can be combined to form new, often more complex shapes. For example, a square and two rectangles can form a trapezoid; a star might be formed by combining five triangles and a pentagon; a cube is made from six squares; and the net of a cylinder is made from two circles and a rectangle. Instruction of this standard is often hands on and exploratory, using tools like pattern blocks, magnetic tiles, and paper constructions. Older students will later refer to these combinations as "nets" when working with surface area and 3-D shape construction, but first graders are focused on developing early spatial reasoning and shape composition skills. These understandings help lay the groundwork for future geometry concepts like area and perimeter.

Instructional Examples:

- A teacher can provide students with a collection of pattern blocks or magnetic tiles (triangles, squares, hexagons, trapezoids) and challenge them to compose new 2-D or 3-D shapes. For example, students might combine two triangles to make a square, six triangles to make a hexagon, or six squares to make a cube. The teacher might follow this by asking reflective questions such as "What shapes did you use to make this new one?", "Can you make the same shape a different way?", etc.
- Teachers might engage students in an activity where they are provided with pattern blocks and a shape template and asked to use the pattern blocks to make the shape (e.g., an octagon, a fish, etc.). The teacher can provide opportunities for students to share their strategies, the number of blocks they used, the shapes they chose to use, or can challenge students to try and use as few shapes as possible. An example of this task can be found on the website Math for Love (Finkle, 2022).
- Students might work in rotating teams at shape building stations stocked with 2-D and 3-D materials such as pattern blocks, paper cutouts, connecting cubes, geometric solids, magnetic tiles, etc. At each station, the teacher might place a challenge card such as: "Build a new shape using exactly three different 2D shapes.", "Use 3-D shapes to build something that could stand on its own.", "Create something you have seen in our community, like a house, car, or playground.", etc. Students then work together to build, draw, and label their creations, rotating stations periodically where they might add to or redesign the previous groups' work.

IEFA Integration Example: Parfleche Containers

Context and Connection:

Parfleche (/pärˌfleSH/) is a term that is used for both the dried-rawhide material that features designs and the containers fashioned from that hide by Indigenous Peoples from many Nations across the Great Plains, Plateau, Great Basin, and Southwest regions of America (Meredith, 2020). These containers came in a variety of shapes – from cylinders and boxes to envelopes and pouches.

Parfleches were often painted with geometric designs that lined up perfectly when the container was folded closed (Meredith, 2020). These designs reflected the Tribal traditions, personal style, and connection of each individual artist. Materials were gathered from the environment such as hide from animals like bison, deer, or elk, pigment from minerals and plants, and laces cut by hand.

Different tribes had distinct styles, for example:

- Apsáalooke (Crow) artists made tall, cylinder-shaped parfleches with long fringe (up to 36 inches!).
- Niitsitapi/Amskapi Pikuni (Blackfeet) cases were known for bold patterns and long fringe.
- Tsêhésenêstsestôtse/So'taa'eo'o (Northern Cheyenne) artists made flat cases with intricate designs.
- Lakota, Dakota (Sioux) artists made box-shaped containers that became more common as people traveled in wagons (Meredith, 2020).

Although bison hide was once preferred, artists later used elk, horse, cow, or moose as bison were nearly eradicated. Despite pressure to abandon these traditions during the reservation era, Indigenous artists continued making parfleches well into the 1900s and today, artists across many tribes are reclaiming and revitalizing this traditional artwork.

Task Description:

Students will examine tribally specific examples of parfleche containers, examine differences in shape, and geometric design elements. Teachers might choose to present photos from museum collections or tribal archives, or might work with local museums, cultural centers, Knowledge Keepers, or Elders to bring in physical or virtual examples of parfleche containers from the Crow, Blackfeet, Cheyenne, Lakota, Dakota, or other Tribal Nations.

Teachers should note that there is a potential for students to develop misconceptions about the difference between the 2D shapes painted on the parfleche or that make up the net (2D pattern that forms the solid when folded), and the 3D shape of the container itself. They should be conscious of this potential and clarify periodically throughout the lesson activities to prevent the development of this misconception.

1. Observe and Discuss:
    - Show examples from different Tribal Nations.

- Prompt students' thinking with questions like: "What shapes do you see in the designs?", "What shapes do you think were used to build this container", "How do you think a flat shape turns into a box or cylinder?", etc.

2. Explore Shape Composition:
   - Provide students with manipulatives they can use to experiment composing 3D shapes from 2D shapes. Manipulatives might include items like pattern blocks, magnetic tiles, cut paper shapes, or nets of 3D shapes (templates are offered in the National Park Service Lesson Plan), etc.
   - Encourage students to experiment with composing 3D shapes (e.g., "Can you fold rectangles and circles into a cylinder?", "Can you combine shapes to make a box?", "Can you stack 2D shapes to make new shapes?", etc.)
3. Design Your Own Parfleche:
   - Each student should choose a container shape to model (e.g., box, cylinder, envelope, etc.)
   - On the flat material (e.g., paper, poster board, cardboard, etc.), they create or color a geometric design using bold colors and simple shapes (e.g., triangles, diamonds, etc.)
   - Once their design is complete, they fold the material into a 3D shape and observe the following: "Do the shapes line up the way you expected?", "Did anything change when it was folded?", "How does your design look now that it is a 3D object?", etc.
4. Reflect and Share:
   - Invite students to explain what shapes they used to build their container, how their flat design changes once it was folded, what they noticed about the shapes in historical parfleches, etc.
   - Consider asking students to reflect on tribal examples by comparing student creations to the designs they saw at the beginning of the activity.
   - Consider sharing that parfleches typically held all sorts of items – from household goods to ceremonial items. Ask students to think about what their parfleche would hold.
   - Consider connecting the practice back to the artists who are trying to preserve this practice for future generations by asking: "Indigenous artists today are keeping this tradition alive so future generations can learn about it. What is something you would want to make sure exists in the future? Why?"

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.

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 Tribes or Individuals, this task would achieve the "contributions" level. With context relating to tribally or individually specific artwork, a slightly deeper depth and engagement might be engaged that would achieve the "additive" level. Connecting this task with the specific practices or artistic expressions with reflection questions that help students to draw connections to contemporary experiences, personal expressions, or Indigenous perspectives activates a level of depth and engagement for learners that rises to the "transformation" level.

Relevant Resources:

- Parfleches: How Native Women Pushed the Envelops of Abstraction – First American Art Magazine
- Parfleche Results – The Met
- Parfleche Results – The Smithsonian – National Museum of the American Indian
- Shoshone Parfleche – Lived History, the Wind River Virtual Museum - Wyoming PBS
- Intro to Rawhide Containers - NICE Omaha
- Parfleche, Quillwork, Basketry – National Park Service (Includes templates for envelope and box parfleche containers and instructions)

Note: Additional resources may be found through local museum or cultural centers. Many of these organizations have learning trunks available that feature parfleche items that allow students the opportunity to physically touch and engage with replicas of traditional items.

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** compose new shapes using two- and three-dimensional shapes without **intensive support**.
2. **Developing:** The student **can** compose new shapes using two- **or** three-dimensional shapes with independence and accuracy **or** can engage both skills with **some support**.
3. **Proficient:** The student **can** compose new shapes using two- **and** three-dimensional shapes **with independence and accuracy**.
4. **Mastery:** The student **can** compose new shapes using two- **and** three-dimensional shapes **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.1.G.4

Partition circles and rectangles into two and four equal shares. Describe the shares using the words: halves, fourths, and quarters.

General Notes:

This standard asks students to understand how to divide circles and rectangles into two or four equal parts. When a shape is divided into two equal parts, each part is called a half. When it is divided into four equal parts, each part is called a quarter or a fourth (these words mean the same thing in this context). At this stage, the goal is to develop a strong visual and conceptual understanding of equal parts rather than introduce formal fraction symbols like ½ or ¼. They should be able to describe the parts using the vocabulary "halves" and "fourths" or "quarters" and understand that each part must be the same size. This standard begins to build the idea that the more equal parts a shape is divided into, the smaller each part becomes (e.g., one fourth is smaller than one half). This is an essential understanding to build future fluency in fractions and division concepts.

Instructional Examples:

- The teacher could provide students with paper circles and rectangles and ask them to fold the shapes to create two equal parts and then four equal parts. The students can then unfold their shapes and trace their folds, using correct vocabulary to label each part. The teacher can use this as an opportunity to emphasize precision by asking questions such as "How do we know the parts are truly equal?"
- The teacher can connect the activity to a familiar context, such as pizza, pie, or corn bread, and ask students to partition the item into two or four equal shares to make sure each person gets an equivalent amount. Students can model this by forming the item with paper or clay, then dividing it into equal parts.
- Students might engage in an "Art of Sharing" gallery walk where the objective is to partition circles and rectangles into equal shares and describe how they should share these items fairly using precise language. The teacher can introduce the idea of things students might share (food, art supplies, space, cookies, lunch trays, etc.), and ask students to select one circular, and one rectangular item they'd like to share. Using paper, digital drawing tools, modeling clay, or other materials, the student can build or draw their chosen objects and show how they would divide them into two or four equal shares. Students should form responses such as "I would share my cookie in two equal parts so my friend and I each get one half." to describe what is shown. The class might also display their work as a gallery walk around the room, offering opportunities to observe each example and ask questions like "Would it still be fair if we cut it a different way?", "How do you know the shares are equal?", "Which items are easiest or hardest to share equally?", etc.

IEFA Integration Example: Seasonal Rounds

Context and Connection:

Seasonal Rounds are circular depictions of ecological and cultural cycles. These have guided many of Montana's Indigenous communities for millennia by creating illustrations of key connections between natural phenomena and communal lifeways. Each tribe in Montana has relied on these Seasonal Rounds to inform when to gather food, move camps, or hold certain ceremonies. They blend traditional knowledge of seasonal and celestial observations passed down through generations of storytelling and practice. Today, these diagrams can be used to demonstrate both Indigenous and scientific perspectives. The following task provides resources specific to the four tribes, the Niitsitapi/Amskapi Pikuni (Blackfeet), Séliš (Salish), Newe/Neme (Shoshone Bannock), and Nimíipuu (Nez Perce), but local relevancy can be engaged with relative ease and educators are encouraged to work with Tribal communities and Knowledge Keepers to bring in additional resources, contexts, and examples.

Task Description:

Students will start by examining one or more Indigenous Seasonal Rounds such as those of the Niitsitapi/Amskapi Pikuni (Blackfeet), Séliš (Salish), Newe/Neme (Shoshone Bannock), Nimíipuu (Nez Perce), or other Montana Indigenous community. While viewing these examples, the teacher will guide students in noticing how each round is divided, reflecting on different parts of the year and how seasonal changes, such as plant emergence, wildlife behaviors, or cultural activities are represented at certain times of the year. Students will then share their personal experiences during winter, spring, summer, and autumn. They may also discuss how what they see or do during seasons might be aligned or differentiated from those on traditional representations.

Students will be invited to create their own Seasonal Round by partitioning a circle into four equal parts and labeling each quarter with a season. They should be able to accurately use the vocabulary "quarters, halves, and fourths" during this activity. This language could be engaged in a variety of ways, including asking questions such as "What share of the circle is Spring?" (a fourth), "What portion of the Seasonal Round is cold?" (half), "What share of the Seasonal Round is colored green?" (quarter), etc. The teacher could engage students physically in this activity by assigning each corner of the classroom a quadrant of the Seasonal Round and asking students to physically go to the quadrant that corresponds with their answer (e.g., "Which season is hot?") Additionally, students might physically model a "quarter turn" or "half turn" around the Seasonal Round by turning their bodies around a circle on the ground or their fingers along the edge of a printed Seasonal Round.

Students should have access to a variety of artistic supplies such as drawing, collage, painting, cut out shapes, etc. to fill each quarter with the images or words that reflect what they most notice or enjoy during each season. This should encourage students to connect geometric understanding of quarters with their lived experiences of seasonal differences.

To expand the lesson, students can compare the Seasonal Rounds to the traditional ones they studied and reflect on similarities and differences. Students could consider which activities they engage in at certain times of the year, and reflect on the question "What activities or traditions do you

hope continue in the future?" The teacher could also extend this lesson with connections to the district graduate profile by asking students to relate the activities they engage in at certain times of the year to the skills in the profile. For example, if students go sledding in the winter, and the graduate profile includes a value such as 'communication', the teacher might ask how communication is used in the activity of sledding (e.g., sharing, not arguing over the sled).

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:

Additive, Transformation, or Social Action – Describing the specific experiences of Indigenous individuals, drawing connections between traditions associated with multiple Tribes, or including tribally specific resources would achieve the level of "additive." Alternatively, engaging resources and reflection questions that allow students to consider the perspectives of specific Tribes or Indigenous individuals and draw connections to contemporary experiences activates a level of depth and engagement for learners that rises to the "transformation" level. There is also a possibility of reaching the "social action" level of the multicultural framework through the exploration of traditions and a discussion around small actions students can take to protect the seasons or ensure traditions persist.

Relevant Resources:

- The Salish Seasonal Round – Julie Cajune
- The Blackfeet Seasonal Round – Trial Tribes
- The Blackfeet Seasonal Round Teacher Toolkit – Rosalyn LaPier, Piegan Institute
- Nez Perce Seasonal Round – National Park Service
- Fun-Ology Part 1 – Fun-Ology Part 2 - Fun-Ology Part 3 - (Resource bank and model unit for grades 3-5) – OPI IEFA

Proficiency Rubric Example:

1. **Beginning:** The student is **not yet able to** partition circles and rectangles into two and four equal shares and describe the shares using the words: halves, fourths, and quarters without **intensive support**.
2. **Developing:** The student **can** partition circles **or** rectangles into two **or** four equal shares **or** describe the shares using the words: halves, fourths, and quarters with independence and accuracy **or** can engage all skills with **some support**.

3. **Proficient:** The student **can** partition circles **and** rectangles into two **and** four equal shares **and** describe the shares using the words: halves, fourths, and quarters **with independence and accuracy**.
4. **Mastery:** The student **can** partition circles **and** rectangles into two **and** four equal share **and** describe the shares using the words: halves, fourths, and quarters **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 1 Content Standards with Common Core Standards

Montana Standard Code	Corresponding Common Core Standard(s)
MT.1.OA.1	CCSS.1.OA.A.1
MT.1.OA.2	CCSS.1.OA.A.2
MT.1.OA.3	CCSS.1.OA.B.3
MT.1.OA.4	CCSS.1.OA.B.4
MT.1.OA.5	CCSS.1.OA.C.5
MT.1.OA.6	CCSS.1.OA.C.6
MT.1.OA.7	CCSS.1.OA.C.6
MT.1.OA.8	CCSS.1.OA.D.7
MT.1.OA.9	CCSS.1.OA.D.8
MT.1.NBT.1	CCSS.1.NBT.A.1
MT.1.NBT.2	CCSS.1.NBT.B.2
MT.1.NBT.3	CCSS.1.NBT.B.3
MT.1.NBT.4	CCSS.1.NBT.C.4
MT.1.NBT.5	CCSS.1.NBT.C.5
MT.1.NBT.6	CCSS.1.NBT.C.6
MT.1.MD.1	CCSS.1.MD.A.1
MT.1.MD.2	CCSS.1.MD.A.2
MT.1.MD.3	CCSS.1.MD.B.3
MT.1.MD.4	**No corresponding standard**
MT.1.MD.5	CCSS.1.MD.C.4
MT.1.G.1	CCSS.1.G.A.1
MT.1.G.2	**No corresponding standard**
MT.1.G.3	CCSS.1.G.A.2
MT.1.G.4	CCSS.1.G.A.3

Appendix B: Addressing Financial Literacy in the Grade 1 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 1 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 1 Mathematics Content Standards contain one standard that specifically addresses financial literacy themes:

MT.1.MD.4: Identify the value of coins.

- 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 real or pretend coins and have them identify the values of each coin. Have proficient or highly proficient students use a sorting activity to group coins by type and then have students calculate the total value of each group. Discuss how coins 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 1 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. Educators should be mindful of this distinction when designing assessments to ensure alignment with the intended standard.

The Montana grade 1 Content Standards that may address financial literacy through problems in context are:

MT.1.OA.1	MT.1.OA.4	MT.1.OA.7	MT.1.NBT.1	MT.1.NBT.4	MT.1.MD.5
MT.1.OA.2	MT.1.OA.5	MT.1.OA.8	MT.1.NBT.2	MT.1.NBT.5	
MT.1.OA.3	MT.1.OA.6	MT.1.OA.9	MT.1.NBT.3	MT.1.NBT.6	

Appendix C: K – 2 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 to a student's grade 1 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 1 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 1 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.

Kindergarten – Grade 1 – Grade 2 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 K-2 continuum.

Kindergarten	Grade 1	Grade 2
MT.K.CC.1, MT.K.CC.3, MT.K.CC.2	MT.1.NBT.1	MT.2.NBT.3, MT.2.NBT.2
MT.K.CC.4	MT.1.OA.5	MT.2.MD.6
MT.K.CC.5, MT.K.CC.6, MT.K.CC.7	MT.1.OA.8, MT.1.NBT.3	MT.2.OA.4, MT.2.OA.3, MT.2.NBT.4
MT.K.OA.1, MT.K.OA.6	Foundational Skill	MT.2.NBT.9
MT.K.OA.3, MT.K.NBT.1	MT.1.OA.3, MT.1.NBT.2	MT.2.NBT.1
MT.K.OA.4	MT.1.OA.4, MT.1.OA.9	Foundational Skill
MT.K.OA.5	MT.1.OA.6 MT.1.OA.7	MT.2.OA.2, MT.2.NBT.5 MT.2.NBT.6 , MT.2.NBT.7
MT.K.OA.2	MT.1.OA.1, MT.2.OA.2, MT.1.NBT.4 MT.1.NBT.5, MT.1.NBT.6	MT.2.OA.1, MT.2.MD.5, MT.2.MD.11 MT.2.NBT.8
MT.K.MD.1, MT.K.MD.2	MT.1.MD.1 MT.1.MD.2	MT.2.MD.1, MT.2.MT.2 MT.2.MD.3, MT.2.MD.4
MT.K.MD.3	MT.1.MD.5	MT.2.MD.9, MT.2.MD.10
MT.K.MD.4	MT.1.MD.4	MT.2.MD.8
MT.K.MD.5	MT.1.MD.3	MT.2.MD.7
MT.K.G.1	Foundational Skill	Foundational Skill
MT.K.G.2, MT.K.G.3, MT.K.G.4	MT.1.G.1, MT.1.G.2	MT.2.G.1
MT.K.G.5, MT.K.G.6	MT.1.G.3	Foundational Skill
Foundational Skill	MT.1.G.4	MT.2.G.2, MT.2.G.3

Kindergarten – Grade 1 – Grade 2 Vertical Alignment Elaborations:

Kindergarten	Grade 1	Grade 2
MT.K.CC.1 - Flexibly count to 100 by ones and by tens. **MT.K.CC.3** - Write numbers from 0-20 and represent a number of objects with a written numeral 0-20. **MT.K.CC.2** - Count beginning from a given number within the known sequence.	**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.

Elaboration:

- In **Kindergarten**, students learn to count to 100 by ones and tens, to write numbers from 0-20 using numerals, and to count from a given number. Each of these skills contributes to the acquisition of numerical fluency, specifically the ability to flexibly count, read, write, and represent numbers.
- **Grade 1** extends these skills by introducing counting, reading, and writing numbers up to 120. This supports fluency and prepares students for more complex number representation in advancing grades by introducing larger numbers incrementally to later develop an understanding of place value.
- By **grade 2**, students have expanded their abilities to count, read, write, and represent numbers to 1000, and they have acquired the ability to flexibly count by using skip counting. They will continue to use these skills to establish a deeper understanding of place value and prepare to work with larger numbers in advancing grade levels. Skip counting also establishes a foundation for multiplication.

Kindergarten	Grade 1	Grade 2
MT.K.CC.4 - Understand the relationship between numbers and quantities and connect counting to cardinality by recognizing that each successive number name refers to a quantity that is one larger within a normal counting sequence.	**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.

Elaboration:

- In **Kindergarten**, students begin to develop an understanding of cardinality (that each successive number name represents a quantity that is one larger). They will use the comprehension of “one more/less” to begin to relate this concept to addition and subtraction.
- In **grade 1**, students use this foundation to build early strategies for addition (e.g., counting on) and subtraction (e.g., counting backward).
- By **grade 2**, this understanding is extended to using the number line as a visual representation of sums and differences. This sequence forms a seamless transition from the concrete (counting) to pictorial (number line) representation of sums and differences to help students transition to the abstract (using numbers and symbols).

Kindergarten	Grade 1	Grade 2
MT.K.CC.5 - Count to answer "how many?" in a variety of arrangements and, given a number, produce a set within 20. **MT.K.CC.6** - Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group. **MT.K.CC.7** - Compare two numbers between 1 and 10 presented as written numerals.	**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.

Elaboration:

- **Kindergarten** introduces counting objects in a variety of arrangements and producing sets up to 20, introduces comparing quantities by determining if one group is greater than, less than, or equal to another group of objects, and expands this concept by requiring students to compare written numerals (1–10). This supports transitioning from concrete, pictorial, and abstract (symbolic) representations.
- In **Grade 1,** students build on these skills by comparing two-digit numbers using the symbols >, =, and <, connecting comparison to place value. MT.1.OA.8 reinforces the meaning of equality and numerical comparison and prepares students to analyze and interpret relationships between numbers, equations, and symbols. This progression begins with concrete comparison of physical objects and eventually transitions to comparing abstract numerals. Students then progress to engaging these skills using symbols and by interpreting equations as true or false.
- These foundational skills prepare students for **grade 2** where students use addition to find the total number of objects arranged in rectangular arrays, determine whether a group has an odd or even number of items, and compare values. The progression moves from counting objects individually in kindergarten to recognizing structured groupings in grade 2 and then using addition to compute totals. In grade 2, students are also introduced to odd and even reasoning by grouping objects.

Kindergarten	Grade 1	Grade 2
MT.K.OA.1- Represent addition and subtraction in multiple ways. **MT.K.OA.6** - Recognize the characteristics of the commutative property in addition.	Although no specific grade 1 standard is identified, this strategy serves as a foundational tool across multiple grade 1 standards and is crucial for flexibly solving addition and subtraction problems in grade 1 and beyond.	**MT.2.NBT.9** - Understand and make connections between different strategies for addition and subtraction.

Elaboration:

- **Kindergarten** introduces the concept of representing addition and subtraction in multiple ways, including using objects, drawings, or equations. Students also begin to recognize the commutative property in addition (e.g., 3 + 2 = 2 + 3) as a basic concept for understanding flexibility in addition strategies.
- Although no explicit **grade 1** standards have been identified here, it is not because there are no connections to Grade 1. Teachers should understand that these kindergarten standards serve as foundational concepts to all addition and subtraction problems and higher mathematics. They were separated from other Operations and Algebraic Thinking (OA) problems due to their foundational support to all standards in this domain, not a lack of connectivity. Recognizing the commutative property early in kindergarten develops flexible thinking and sets students up for understanding the structure of addition.
- **Grade 2** deepens this understanding by asking students to compare and make connections between different strategies for addition and subtraction, such as using place value, number lines, and decomposing numbers.

Kindergarten	Grade 1	Grade 2
MT.K.OA.3 - Decompose numbers less than or equal to 10 into pairs in multiple ways. **MT.K.NBT.1** - Compose and decompose numbers from 11-19 into ten ones and further ones in multiple ways and record each composition or decomposition by a drawing or an equation.	**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.

Elaboration:

- In **Kindergarten**, students are introduced to decomposing numbers up to 10 into pairs, which helps them understand part-whole relationships. Then this understanding is expanded to numbers between 11–19 to emphasizing the concept of ten ones and extra ones. This prepares students for concepts like place value and flexible addition and subtraction.
- **Grade 1** builds these skills by generalizing decomposition to support addition and subtraction and formalizes the idea of place value by defining two-digit numbers as tens and ones. Understanding how numbers compose and decompose helps students visualize quantities and leads to a stronger grasp of number relationships and mathematical reasoning.
- By **grade 2**, students extend this knowledge to three-digit numbers, learn to view 100 as ten tens, and recognize the structure of hundreds, tens, and ones.

Kindergarten	Grade 1	Grade 2
MT.K.OA.4 - For any number from 1 to 9, find the number that makes 10 when added to the given number.	**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.

Elaboration:

- In **Kindergarten**, students are introduced to finding missing addends that sum to 10. This lays the foundation for understanding unknown values in equations, which is a key foundational block of algebraic reasoning.
- In **grade 1**, MT.1.OA.4 builds on this by explicitly framing subtraction as an unknown-addend problem while MT.1.OA.9 generalizes this understanding to determine unknown numbers in both addition and subtraction equations involving three numbers.
- Although no explicit **grade 2** standards have been identified here, it is not because there are no connections to Grade 2. Teachers should understand that this standard progression serves as a foundation to all addition and subtraction problems across grade levels. They were separated from other Operations and Algebraic Thinking (OA) problems due to their foundational support to all standards in this domain, not a lack of connectivity.

Kindergarten	Grade 1	Grade 2
MT.K.OA.5 - Flexibly and accurately add and subtract within 5.	**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. (Note: also heavily connected to MT.K.OA.1)	**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.

Elaboration:

- **Kindergarten** focuses on developing the basics of fluency through flexibility and accuracy with addition and subtraction within five. Students begin to explore basic part-whole relationships and practice simple computation, which set the stage for more complex strategies in future grades.
- In **grade 1**, students extend their fluency (flexibility, accuracy, and efficiency) to addition and subtraction within 10. They also begin to use multiple strategies to solve problems within 20 and deepen their conceptual understanding of numbers and operations. These skills serve as critical building blocks for multi-digit computation, which is a key requirement in grade 2.
- **Grade 2** students develop fluency (flexibility, accuracy, and efficiency) within 20 using mental strategies and apply multiple strategies to solve problems within 100 and 1000. This progression builds a bridge to mastering place value as well as computational reasoning and fluency.

Kindergarten	Grade 1	Grade 2
MT.K.OA.2- Solve addition and subtraction problems in context within 10. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.	**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.

Elaboration:

- In **Kindergarten**, students are introduced to solving addition and subtraction problems involving two numbers, in context, within 10.
- **Grade 1** extends this understanding of addition and subtraction to 20, introduces the concept of adding three whole numbers, and engages the concept of place value, which construct a strong foundation for addition and subtraction within 100.
- By **grade 2**, students build on their understanding of concepts from Kindergarten and Grade 1 to solve one- and two-step problems within 100. They apply these skills to applied contexts, such as working with lengths and data, and using place value knowledge to add and subtract. These applications require students to engage the fluency they developed in earlier grade levels.

Kindergarten	Grade 1	Grade 2
MT.K.MD.1 - Describe several attributes of a single object. **MT.K.MD.2** - Directly compare two objects with a measurable attribute in common using comparative language.	**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.

Elaboration:

- In **Kindergarten**, students begin to observe and describe attributes of a single object, such as length, weight, or height. Students also compare two objects with a shared measurable attribute using developmentally appropriate language (e.g., longer, heavier, shorter).
- In **grade 1,** students build on these skills by comparing and ordering objects by length, using a third object as a reference. This requires students to engage early abstract reasoning skills. Eventually, students' progress to measuring the length of objects using whole numbers units, ensuring no gaps or overlaps.
- By **grade 2**, students can apply these skills to measure the lengths of objects, using different units to explore the relationship between size and the number of units required. They are also able to estimate lengths and apply the comparative and arithmetic skills they developed to determine how much longer one object is than another. By acquiring the prerequisite skills in kindergarten and grade 1, the student is better able to connect the concreate concepts of comparative length (e.g., longer, shorter) to the abstract application of measurement and units (e.g., "3 inches").

Kindergarten	Grade 1	Grade 2
MT.K.MD.3 - Classify, count, and sort objects into categories. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities.	**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.

Elaboration:

- In **Kindergarten**, students begin by classifying, counting, and sorting objects into categories. This provides foundational skills in organizing and understanding data through hands-on exploration and categorization.
- **Grade 1** builds upon these skills by introducing students to organizing, representing, and interpreting data with up to three categories. Students analyze and compare categories, identifying data points and their differences.
- By **grade 2**, students expand their data analysis skills, generate measurement data, represent it in various ways, and integrate contexts. This progression serves as the foundation of data literacy for students, which is essential to both future mathematical learning and civic engagement.

Kindergarten	Grade 1	Grade 2
MT.K.MD.4 - Describe attributes and identify the names of coins.	**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.

Elaboration:

- In **Kindergarten**, students start by learning to describe the physical attributes (e.g., size, color, and texture) and identifying the names of coins (e.g., penny, nickel, dime, quarter).
- **Grade 1** students expand this foundation by beginning to associate coins with their respective values to introduce numerical relationships and prepare students for basic money-related calculations.
- By **grade 2**, students extend their understanding to solve problems involving the use of dollar bills, quarters, dimes, nickels, and pennies in context. Students are also required to use appropriate symbols within problem-solving, which supports precision.

Kindergarten	Grade 1	Grade 2
MT.K.MD.5 - Explain time in days, months, years, and seasons.	**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.

Elaboration:

- In **Kindergarten**, the focus is on the broader concepts of time specifically days, months, years, and seasons. Students will develop this foundation to support their ability to engage in more precise time-telling in the future.
- In **grade 1**, students transition to measuring and recording specific points in time (e.g., hours and half-hours) using both analog and digital clocks.
- By **grade 2**, students continue to refine their time-telling to the ability to work within increments of five minutes and use a.m. and p.m. to denote the difference between a.m. and p.m. The progression from understanding general concepts of time (kindergarten) to specific time-telling (Grades 1 & 2) equips students with skills necessary to develop a deeper understanding of how time is measured and used in daily experiences. This supports experiential applications such as reading schedules, planning activities, and interpreting time-related data. The context of time also presents an entry point for students in later grades as they begin to understand concepts related to fractions (e.g., ½ hour = 30 minutes, 1/7 week = 1 day, etc.), to help students understand that fractions are a part of a whole.

Kindergarten	Grade 1	Grade 2
MT.K.G.2 - Correctly name shapes regardless of their orientations or overall size. **MT.K.G.3** - Identify shapes as two-dimensional or three-dimensional. **MT.K.G.4** - Analyze and compare two- and three-dimensional shapes using informal language and other attributes.	**MT.1.G.1** - Distinguish between defining attributes and nondefining attributes. **MT.1.G.2** - Build and draw shapes to possess defining attributes.	**MT.2.G.1** - Recognize and draw shapes having specified attributes.

Elaboration:

- **Kindergarten** builds a foundation for recognizing attributes of shapes, distinguishing between two- and three-dimensional shapes, and applying comparison skills to the context of shapes using developmentally appropriate informal language, preparing students to describe and differentiate shapes.
- **Grade 1** builds on these skills by teaching students to differentiate between defining attributes (e.g., number of sides) and nondefining attributes (e.g., color, orientation). Students also reinforce this understanding by creating shapes with specific attributes.
- By **grade 2**, students can recognize and draw shapes with specified attributes, applying earlier knowledge with precision and fluency.

Kindergarten	Grade 1	Grade 2
MT.K.G.5 - Model shapes in the environment. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities. **MT.K.G.6** - Compose simple shapes to form larger shapes.	**MT.1.G.3** - Compose new shapes using two- and three-dimensional shapes.	Although no specific Grade 2 standard is identified, this standard serves as a foundational tool across multiple Grade 2 standards and is crucial for developing geometry and problem-solving skills in Grade 2 and beyond.

Elaboration:

- In **Kindergarten**, students are introduced to the ability to compose simple shapes, to form larger shapes which establishes foundational spatial reasoning and the development of an understanding of how smaller parts contribute to a whole. This skill develops the students' ability to visualize and manipulate geometric forms.
- **Grade 1** requires students to compose new shapes using two- and three-dimensional shapes, which enhances their ability to integrate and reorganize components into more complex structures.
- Although no explicit **grade 2** standards have been identified here, it is not because there are no connections to Grade 2. Teachers should understand that this standard progression serves as a foundation to geometric reasoning standards across grade levels. They were separated from other Geometry (G) problems due to their foundational support to all standards in this domain, not a lack of connectivity. The ability to compose shapes conversely supports students' ability to partition shapes.

Kindergarten	Grade 1	Grade 2
Although no specific kindergarten standard is identified, this standard serves as a foundational tool across multiple standards and is crucial for developing geometry and problem-solving skills in Grade 1 and beyond.	**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.

Elaboration:

- Although no explicit **kindergarten** standards have been identified here, it is not because there are no connections present. The kindergarten skills of working with shape compositions is a converse skill of working with shape partitions. Understanding how shapes can be combined or separated helps students make sense of shares, parts, and builds a foundation for fractional thinking in later grades through concrete and pictorial representations.
- **Grade 1** introduces the concept of partitioning circles and rectangles into two and four equal shares, introducing basic fractions such as halves and fourths. This reinforces the idea of equal partitions, introduces counting parts in arrays and provides foundational knowledge for working with fractions.
- In **grade 2**, students expand this understanding to include partitioning rectangles into rows and columns of same-size squares, finding the total number, and including additional fractions language, such as thirds. Students further develop their understanding of partitions and learn how to describe these shares using precise fraction language. This acquisition of fractional vocabulary will be foundational to many of the fractions standards in grade 3.

Appendix D: Statement of Gratitude

This work would not have been possible without the time, energy, and unwavering dedication of the many individuals who contributed to its development. We are deeply grateful to those who volunteered their time in service of mathematics education—your expertise, insight, and commitment to improving teaching and learning have shaped this work in meaningful and lasting ways. Thank you for your contributions to a project that will support educators and students across Montana. The following individuals generously shared their time and expertise:

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K-5 Review Task Force

• Becky Berg - K-5 Review • Jenny Combs - K-5 Review • Kayla Ryan - K-5 Review • Amy Jones - K-5 Review

Tribal Panel Feedback Consultants

• Roger MadPlume • Jacie Jeffers • Karry Woodard

Negotiated Rulemaking Committee Members

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IEFA Item Reviewers

• Julie Jeffers • Matthew Bell • Carrie McNab • Michael Jetty • Lindsay Mahoney • Aimee Konzen • Julie Gavin • Michelle Henson • Crystal Hickman • Jen Murphy • Michelle McCarthy • Tammy Hall • Brooke Gondara • Katrina Engeldrum • The Séliš and Qĺispé Culture Committee – Sadie Peone Stops • The Ksanka Culture Committee – Vernon Finley • Stone Child College – Wilma Tyner, Jeremy MacDonald • Montana Advisory Council on Indian Education (MACIE) •

OPI Staff

• Marie Judisch – Teaching and Learning Senior Manager • Aimee Konzen – Professional Learning Manager • Katrina Engeldrum – Math Instructional Coordinator • Michelle McCarthy – Science Instructional Coordinator • Claire Mikeson – ELA Instructional Coordinator • Eva Cox – Professional Development Specialist • Jackie Ronning – Early Learning Specialist • Kimberly Evans – Early Learning Analyst • Allyson Fraser and Kate Gammill– Teacher Learning Hub Coordinators • Julie Jeffers, Michael Jetty, and Carrie McNab – IEFA Education Specialists • Matthew Bell – Language and Culture Specialist • Michele Henson, Jen Murphy, and Crystal Hickman – American Indian Student Achievement Specialists • Brooke Gondara – Director of Indian Education.

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