Minnesota K–12 Academic Standards in Mathematics: Version two, May 2022

Introduction

Version two of the Minnesota K–12 Academic Standards in Mathematics represents the work of the Mathematics Standards Review Committee to date. This committee includes K–12 teachers, administrators, college faculty and representatives of educational and community organizations. The committee membership, timeline and assumptions that guided their work are found on the Minnesota Department of Education (MDE) Mathematics webpage.

During the 2021–22 school year, the Mathematics Standards Review Committee has been in the process of reviewing the 2007 Minnesota K–12 Academic Standards Mathematics, other states' recently revised standards, current academic research and K–12 instructional best practices to prepare students to become career, college and citizenship ready.

The committee is seeking feedback from all Minnesotans on their work to date. This review process follows the guidelines outlined in Minnesota Statutes 2021, section 120B.021. In addition to the timing of the mathematics review, the statute, as stated in subdivision 4a, directs the commissioner to "include the contributions of Minnesota American Indian tribes and communities as related to the academic standards during the review and revision of the required academic standards." In this version the committee is seeking feedback on how to meet the expectations laid out in statute within the mathematics standards – in the Anchor Standards, or in the benchmarks, or using the Contribution and Context (CC) notation.

Mathematics Readiness for Career, College and Civic Engagement Statement

"Let's put our minds together and see what kind of future we can build for our children." – Chief Sitting Bull

Mathematics belongs to all of us. Mathematics is part of our everyday lives and is rooted in all cultures. Access and equity for each and every student in mathematics is accomplished by recognizing, respecting and attending to the diverse strengths of our students with the aim of ensuring that all students are able to learn and thrive. Mathematics is essential for each and every student to use in daily decision making, from finances, personal health, civic discourse and policy-making to their ability to comprehend and analyze data.

Mathematics education needs to evolve with the constant cultural and technological changes in our society. The World Economic Forum's *Future of Jobs Report* includes complex problem-solving, critical

thinking, reasoning, analytical thinking and active learning in its list of Top 10 Workplace Skills for 2025. These are all skills that are developed in the study of mathematics throughout a student's K-12 experience.

The goal of mathematics education is to prepare each and every student for effective participation in society, including in careers and post-secondary education. Each and every student should learn mathematics "in order to expand professional opportunities, understand and critique the world, and experience the joy, wonder, and beauty of mathematics." (Catalyzing Change Series from NCTM)

Students who are mathematically prepared for career, college and civic engagement have the experiences, mindset, knowledge and skills to be mathematically literate and productive members of their communities. They are empowered to successfully navigate pathways towards achieving their aspirations. (MDE CCR Resource Guide).

Minnesota career-, college- and citizenship-ready students will:

- Be curious, pose questions and seek patterns in order to make sense of their world.
- Collaborate and communicate their mathematical thinking and contribute to in-depth math discussions.
- Be persistent, flexible and creative problem solvers.
- Make connections among mathematical principles and connect mathematics to other disciplines, experiences outside the classroom, interests and career aspirations.
- Build conceptual understanding, thinking and reasoning in order to develop procedural fluency and problem-solving flexibility.
- Collaborate with cultural perspectives and traditions like and unlike one's own, allowing students to make sense of mathematical concepts and value various mathematical identities connected to lived experiences.
- Solve problems connected to place, story, cultural practices, language and perspectives relevant to historical and contemporary Dakota and Anishinaabe communities. (Minn. Stat. 120B.021 [2021])

In this version two of the mathematical standards, in order to support students to become career, college and citizenship ready, these standards and benchmarks:

- Incorporate the eights Standards for Mathematical Practice (SMPs) to promote experiences that empower students to be "confident in themselves as doers, knowers and sense makers of mathematics." (Catalyzing Change Series from NCTM Elementary version NCTM 2020, p. 23).
- Pursue mathematical rigor with an equal intensity of conceptual understanding, application and procedural skill and fluency. (Achieve the Core).
- Equip students to analyze information in a data-rich environment by including data science and computational thinking throughout the K-12 mathematics experience.

Standards

An *academic standard* is a "summary description of student learning in a required content area." (Minnesota Statutes 120B.018) This document uses an "anchor standard" approach. Thirteen standards establish the overall goals from kindergarten through grade 12.

For ease of organization and consistency with standards in other content areas, the standards will be grouped into strands in the next version (version three) of Minnesota K–12 Academic Standards in Mathematics.

Anchor Standards

Minnesota Statutes 2021, section 120B.021, requires that there be statements of standards and benchmarks. Anchor standards are a summary description of student learning that reflects all learning, spanning from kindergarten to graduation. This differs from the 2007 standards, which had grade-specific standards. Minnesota began using anchor standards in 2010 with the revision of English language arts standards and has since used anchor standards for all Minnesota K–12 Academic Standards: physical education, arts, science, social studies and English language arts. The purpose of anchor standards is to provide a cohesive umbrella for learning across the grade levels to highlight learning progressions of the grade level benchmarks. The K–12 benchmarks supplement the standards with the "specific knowledge or skill that a student must master to complete part of an academic standard by the end of the grade level or grade band" Minn. Stat. 120B.018 (2021).

The proposed anchor standards are:

1. Number Sense: Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.

2. Fluency: Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one procedure is more strategic to apply than another.

3. Proportional Reasoning: Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.

4. Equivalence and Relational Thinking: Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.

5. Patterns and Relationships: Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.

6. Measurement: Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and

Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.

7. Geometry: Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.

8. Spatial Reasoning: Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.

9. Data Sciences: Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.

10. Chance and Uncertainty: Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.

11. Financial Literacy: Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.

Additional Dimensions

Practices used by mathematicians and authentic contexts for mathematical thinking serve as additional dimensions that interact with the grade level benchmarks. The dimensions encourage integration of benchmarks with process (dimension 1) and contribution and context (dimension 2). Mathematical connections to a coherent/comprehensive view of the world provide students' access to Minnesota's Career and College Readiness goal.

Dimension 1: Standards of Mathematical Process (MP)

This dimension focuses on the important practices and processes used by mathematicians, which all students should learn to use with increasing sophistication over their years in school.

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.

- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.
- MP8: Look for and express regularity in repeated reasoning.

Dimension 2: Contribution and Context (CC)

This dimension focuses on using context to do and learn mathematics. All students should make sense and persevere in mathematical problem-solving experiences using local contexts of the learning community and within the context of Minnesota.

- CC1: Connect mathematical problem solving experiences and contributions to place, story, cultural practices, language and perspectives relevant to historical and contemporary Dakota and Anishinaabe communities.
- CC2: Apply mathematical problem-solving experiences to real-world situations in contexts connected to students' lived experiences, cultural perspectives and traditions.

Organization of Standards

The organization and structure of the standards communicates how mathematics education is conceptualized for Minnesota students. There are 11 anchor standards which are consistent across kindergarten through grade 12.

Each standard will have one to 28 benchmarks that are grade-level specific. The benchmarks are placed at the end of the grade level where mastery is expected, with the recognition that a progression of learning experiences in earlier grades builds the foundation for mastery later on.

How to read the standards and benchmarks

In version two, each benchmark has a three-digit code. Standards and benchmarks use relevant portions of that code. In the example below, for benchmark 5.1.2.

- The first symbol is the grade: 5 is grade 5; Grades: 0 = Kindergarten, 9 = 9–12 benchmarks.
- The second digit is the standard: 1 is Students will be able to determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results
- The third digit is the benchmark: 3 is read, write, compare, order and represent whole numbers from 0 to at least 31. Representations may include numerals, pictures, real objects and picture graphs, spoken words and manipulatives such as connecting cubes

The benchmark statement is in plain text.

** indicates a computer science related benchmark.

The benchmark is followed by a reference to the corresponding Additional Dimension: SMP = Standards of Mathematical Practice, CC = Contribution and Context. Refer to the list of the dimensions beginning on page four.

Grade	Anchor Standard	Code	Benchmark
K	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	K.1.1	1. Recognize that a number can be used to represent how many objects are in a set or to represent the position of an object in a sequence. (MP1) {CC1}
K	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	K.1.2	2. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number and with one and only one object. (MP6) {CC1, CC2}
K	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	K.1.3	3. Read, write, compare, order and represent whole numbers from 0 to at least 31. Representations may include numerals, pictures, real objects and picture graphs, spoken words and manipulatives such as connecting cubes. (MP4)
K	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	K.1.4	4. Compose and decompose numbers up to 10 with objects and pictures. (MP7)
K	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	K.1.5	5. Count, with or without objects, to at least 31. (MP6) {CC2}
K	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	K.1.6	6. Count forward beginning from a given number within the known sequence (instead of having to begin at 1). (MP7)

Grade	Anchor Standard	Code	Benchmark
K	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	K.2.1	1. Fluently add and subtract within 5. (MP2)
K	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	K.2.2	2. Find a number that is 1 more or 1 less than a given number. (MP7)
K	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities	K.3.1	1. Count collections of objects by grouping in 10s using ten-frames, cups or other tools. (MP7) {CC1, CC2}
K	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities	K.3.2	2. Identify, create, complete and extend growing patterns involving 10s. (MP1) {CC1, CC2}
K	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	K.4.1	1. Compare and order whole numbers, with and without objects from 0 to at least 31. (MP1) {CC2}
K	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	K.4.2	2. Identify whether the number of objects in one group is greater than, less than or equal to the number of objects in another group (by using matching, counting strategies and numberline)** (MP2)
K	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	K.4.3	3. Compose and decompose numbers from 11-19 into 10s and ones with objects and drawings. (Understand that these numbers are composed of 10 ones and one, two, three, four, five, six, seven, eight or nine ones.) (MP7)

Grade	Anchor Standard	Code	Benchmark
K	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	K.5.1	1. Identify, create, complete and extend simple patterns using shape, color, size, number, sounds and movements. Patterns may be repeating, growing or shrinking such as ABB, ABB, ABB or ●, ●●, ●●●. **(MP1, MP7) {CC1, CC2}
K	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	K.5.2	2. Recognize patterns in counting. Skip count by 10s starting at zero. (MP7) {CC1, CC2}
K	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	K.6.1	1. Compare objects with a measurable attribute in common, to see which object has “more of,” “less of” or the “same as” the attribute and explain reasoning. (MP1, MP3, MP5) {CC1, CC2}
K	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	K.6.2	2. Describe several measurable attributes of objects, such as length or weight. (MP4, MP6) {CC1, CC2}
K	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	K.7.1	1. Sort objects using characteristics such as shape, size, color and thickness. (MP1) {CC1, CC2}
K	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	K.7.2	2. Identify two- and three-dimensional shapes such as squares, circles, triangles, rectangles, trapezoids, hexagons, cubes, cones, cylinders and spheres.(MP2) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
K	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	K.8.1	1. Compose and name numbers and simple shapes. (MP1)
K	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	K.8.2	2. Describe objects in the environment using names of shapes and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind and next to. (MP1, MP6) {CC2}
K	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	K.8.3	3. Name shapes regardless of their overall size. (MP2)
K	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	K.8.4	4. Model shapes in the environment by building shapes from components (e.g., sticks and clay balls) and sketching shapes. (MP4) {CC2}
K	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	K.8.5	5. Decompose numbers less than or equal to five into pairs in more than one way, e.g., by using objects or drawings and recording each decomposition by a drawing or equation. (MP7, MP2)
K	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	K.9.1	1. Notice and wonder about data-rich situations to generate ideas and ask questions, with the teacher helping refine, direct and create statistical investigative questions; understand the purpose of data. (MP1, MP7)

Grade	Anchor Standard	Code	Benchmark
K	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	K.9.2	2. Classify and sort objects, including historical and contemporary objects from Dakota and Anishinaabe Tribal Nations and other communities, into categories and communicate reasoning for the sorting system used, recognizing variability, such as difference sizes in a counting collection; Count the numbers of objects in each category and sort the categories by count.** (MP3, MP7, MP8)
K	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	K.9.3	3. Use tally marks or pictures to represent data; make inferences and summarize results to answer initial statistical questions; communicate results.** (MP1, MP3, MP6)
K	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	K.11.1	Recognize that money has worth, i.e. value. (MP2) {CC1, CC2}
K	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	K.11.2	Define money earned as income. (MP7)

Grade	Anchor Standard	Code	Benchmark
K	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	K.11.3	Distinguish between wants and needs and identify income as a source to meet one's wants and needs. (MP1) {CC1, CC2}
K	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	K.11.4	Identify pennies and dimes; find the value of dimes up to one dollar. (MP1)
1	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	1.1.1	1. Use place value to describe whole numbers between 10 and 120 in terms of 10s and ones. (MP2)

Grade	Anchor Standard	Code	Benchmark
1	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	1.1.2	2. Read, write, compare, order and represent whole numbers from 0 to 120. Representations may include numerals, addition and subtraction, pictures, tally marks, number lines and manipulatives, such as bundles of sticks and base 10 blocks. a. The numbers from 11 to 19 are composed of a 10 and one, two, three, four, five, six, seven, eight or nine ones. (MP7, MP8) b. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight or nine 10s (and 0 ones) (MP7, MP8)
1	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	1.1.3	3. Count, with or without objects, forward and backward from any given number up to 120. {CC2} (MP7)
1	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	1.2.1	1. Use strategies to generate addition and subtraction facts including making 10s, fact families, doubles, doubles plus or minus one, counting on, counting back and the commutative and associative properties. Use the relationship between addition and subtraction to generate basic facts. (MP1, MP7)
1	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	1.2.2	2. Fluently add and subtract within 12. (MP7)

Grade	Anchor Standard	Code	Benchmark
1	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	1.2.3	3. Find a number that is 10 more or 10 less than a given number. (MP7)
1	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.3.1	1. Count collections of objects using groups of 5s or 10s to 100. (MP1)
1	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.3.2	2. Represent the counting strategy and the total using words, symbols and pictures. (MP7, MP8) {CC1, CC2}
1	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.3.3	3. Skip count by 2s, 5s and 10s to 100. (MP7)
1	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.3.4	4. Determine the double of any single digit number. (MP8)
1	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.3.5	5. Create simple patterns using objects, pictures, numbers and rules. Patterns have rules like add 2, add 5, add 10 beginning at 0. (MP7) {CC1, CC2}
1	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	1.4.1	1. Compare and order whole numbers to 120. (MP1)
1	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	1.4.2	2. Compare two, two-digit numbers based on meanings of the 10s and ones digits, recording the results of comparisons with the symbols >, = and <. (MP4)

Grade	Anchor Standard	Code	Benchmark
1	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	1.4.3	3. Apply the commutative and associative properties of addition as strategies to add and subtract. (MP8)
1	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	1.4.4	4. Determine if equations involving addition and subtraction are true or false. (MP2)
1	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	1.4.5	5. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. (MP7)
1	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.5.1	1. Create simple patterns using objects, pictures, numbers and rules. Identify possible rules to complete or extend patterns. Patterns may be repeating, growing or shrinking. Calculators can be used to create and explore patterns.** (MP7) {CC1, CC2}
1	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.5.2	2. Describe what is changing and what is staying the same in a visual growing pattern. (MP1, MP8) {CC1, CC2}
1	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.5.3	3. Recognize patterns in counting by 10s starting at a non-zero number (i.e. 7, 17, 27, …). (MP7) {CC1, CC2}
1	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	1.6.1	1. Order three objects by length; compare the lengths of two objects indirectly by using a third object. (MP2, MP5) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
1	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	1.6.2	2. Measure the length of an object in terms of non-standard units. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps. (MP5) {CC2}
1	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.7.1	1. Describe characteristics of two- and three-dimensional objects, such as triangles, squares, rectangles, circles, rectangular prisms, cylinders, cones and spheres. (MP7, MP8) {CC1, CC2}
1	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.7.2	2. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. (MP1, MP2) {CC1, CC2}
1	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	1.8.1	1. Estimate amounts up to 100 by using visual images of benchmarks of fives and 10s. (MP1, MP2)
1	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	1.8.2	2. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count by ones; justify reasoning by referencing a model. (MP2, MP3)
1	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	1.8.3	3. Describe objects in the environment using names of shapes and describe the relative positions of these objects using left and right. (MP6) {CC2}

Grade	Anchor Standard	Code	Benchmark
1	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	1.8.4	4. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings and record each decomposition by a drawing or equation. (MP7)
1	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	1.8.5	5. Describe representations of numbers using benchmarks like fives and 10s. (MP7, MP6)
1	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	1.8.6	6. Name shapes regardless of their orientations. (MP1)
1	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	1.8.7	7. Compose (combine) two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles and quarter-circles) to create a composite shape and decompose (take apart) composite shapes into triangles, rectangles, squares and sectors. (MP7)
1	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	1.8.8	8. Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths and quarters and use the phrases half of, fourth of and quarter of. Describe the whole as two of or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. (MP4)
1	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	1.9.1	1. Notice and wonder about data-rich situations to refine, direct and create statistical investigative questions with teacher guidance. (MP7)

Grade	Anchor Standard	Code	Benchmark
1	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	1.9.2	2. Have awareness of what counts as data and understand that people collect data to answer questions and that data can vary (e.g. objects have different colors or sizes). (MP1)
1	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	1.9.3	3. Collect survey data and use given data to consider and decide what data will answer a question; Represent the same data as tally marks, drawings or digitally.** (MP1, MP3)
1	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	1.9.4	4. Make predictions using patterns from data visualizations, including data from Dakota and Anishinaabe tribal nations and other communities.** (MP4, MP7, MP8)
1	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	1.9.5	5. Decide key results that answer students' initial questions and ask additional questions that may arise to report to others and solve problems; use data to provide evidence for conclusions.** (MP3, MP6)
1	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	1.10.1	1. Describe outcomes of events as impossible, possible or certain. (MP1) {CC2}
1	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.11.1	1. Identify ways to earn income. (MP1) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
1	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.11.2	2. Distinguish between spending and saving and consider charitable giving. (MP1) {CC1, CC2}
1	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	1.11.3	3. Identify pennies, nickels and dimes; find the value of a group of these coins, up to one dollar. (MP1, MP7)
2	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	2.1.1	1. Read, write, compare, order and represent whole numbers up to 1,000. Representations may include numerals, addition, subtraction, multiplication, words, pictures, tally marks, number lines and manipulatives, such as bundles of sticks and base 10 blocks. (MP4) {CC1, CC2}
2	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	2.1.2	2. Use place value to describe whole numbers between 10 and 1,000 in terms of hundreds, 10s and ones. Know that 100 is 10 tens and 1,000 is 10 hundreds. (MP2)
2	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	2.1.3	3. Compare two and three-digit numbers based on meanings of the hundreds, tens and ones digits, using >, = and < symbols to record the results of comparisons. {CC2}

Grade	Anchor Standard	Code	Benchmark
2	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	2.1.4	4. Use mental strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers. Strategies may include decomposition, expanded notation and partial sums and differences. (MP1, MP7)
2	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	2.1.5	5. Add and subtract within 1,000 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction or using concrete models or drawings and strategies based on place value, properties of operations and/or the relationship between addition and subtraction; relate the strategy to a written method. (MP7) {CC2}
2	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	2.1.6	6. Explain why addition and subtraction strategies work, using place value and the properties of operations. (MP6)
2	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	2.2.1	1. Find 10 more or 10 less than a given three-digit number. Find 100 more or 100 less than a given three-digit number. (MP7)
2	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	2.2.2	2. Fluently add and subtract within 20. (MP7)

Grade	Anchor Standard	Code	Benchmark
2	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.3.1	1. Identify, create and describe simple number patterns involving repeated addition or subtraction, skip counting and arrays of objects such as counters or tiles. Use patterns to solve problems in various contexts. (MP1, MP7, MP8) {CC1, CC2}
2	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.3.2	2. Count collections of objects using groups of 10's and 100's to 1,000. Represent the counting strategy and the total using words, symbols and pictures. (MP1) {CC1, CC2}
2	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.3.3	3. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write a numerical equation to express the total as a sum of equal addends. (MP8) {CC2}
2	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	2.4.1	1. Compare and order whole numbers up to 1,000. (MP4)
2	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	2.4.2	2. Interpret number sentences involving addition, subtraction and unknowns represented by letters. (MP4)
2	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	2.4.3	3. Apply mental strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers. Strategies may include decomposition, expanded notation and partial sums and differences. ** (MP1, MP7)

Grade	Anchor Standard	Code	Benchmark
2	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	2.4.4	4. Use number sentences involving addition, subtraction and unknowns to represent given problem situations. Use the relationship of addition and subtraction to find values for the unknowns that make the number sentences true. (MP4) {CC2}
2	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.5.1	1. Identify, create and describe simple number patterns involving repeated addition or subtraction, skip counting and arrays of objects such as counters or tiles. Use patterns to solve problems in various contexts.** (MP1, MP7, MP8) {CC1, CC2}
2	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.5.2	2. Use numeric expressions to describe a visual growing pattern. (MP8) {CC1, CC2}
2	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.5.3	3. Use addition and subtraction to create and obtain information from tables, bar graphs and tally charts. (MP5) {CC1, CC2}
2	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.5.4	4. Skip count by 2s, 5s and 10s from any given number. Skip count from a non-zero number (i.e. 3, 13, 23, 33). (MP7)

Grade	Anchor Standard	Code	Benchmark
2	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	2.6.1	1. Estimate lengths using units of inches, feet, centimeters and meters. (MP1, MP2, MP5) {CC2}
2	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	2.6.2	2. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks and measuring tapes. (MP5) {CC1, CC2}
2	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	2.6.3	3. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. Relate addition and subtraction to length. (MP5) {CC2}
2	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	2.6.4	4. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ... and represent whole-number sums and differences within 100 on a number line diagram. (MP1, MP4, MP5)
2	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.7.1	1. Classify two- and three-dimensional figures according to the number and shape of faces and the number of sides, edges and vertices (corners). (MP1, MP2) {CC1, CC2}
2	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.7.2	2. Sketch basic two-dimensional shapes, such as squares, circles, triangles, rectangles, trapezoids, hexagons. (MP5) {CC2}

Grade	Anchor Standard	Code	Benchmark
2	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	2.8.1	1. Describe the location of an object in relation to another object. (MP1, MP6) {CC2}
2	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	2.8.2	2. Estimate sums and differences of two-digit numbers. (MP1)
2	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	2.8.3	3. Given a three-digit number, mentally find 10 more or 10 less; 100 more or 100 less than the number; justify reasoning by referencing a model. (MP2, MP3)
2	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	2.8.4	4. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. (MP8)
2	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	2.8.5	5. Partition circles and rectangles into two, three or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc. and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. (MP1, MP7)
2	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	2.8.6	6. Draw the line of symmetry on a 2D regular polygon and simple 2D figures. (MP5)

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2	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	2.9.1	1. Notice and wonder about data-rich situations to refine, direct and create statistical investigative questions with teacher guidance. (MP7)
2	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	2.9.2	2. Be informed about what counts as data and understand that people collect data to answer questions and that data can vary (e.g. objects have different colors or sizes). (MP1)
2	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	2.9.3	3. Collect survey data and use given data to consider and decide what data will answer a question; represent the same data as tally marks, drawings, picture graphs, bar graphs, tables and digitally.** (MP5)
2	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	2.9.4	4. Generate measurement data, including historical and present day ways of measuring from Dakota and Anishinaabe Tribal Nations and other communities, with whole unit lengths (using a variety of tools and the body) and display data on a line plot. (MP 5)
2	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	2.9.5	5. Make predictions using patterns from data visualizations.** (MP4, MP7, MP8)
2	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	2.9.6	6. Decide key results that answer students' initial questions to report to others; draw conclusions and construct an argument.** (MP3, MP6)
2	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	2.10.1	1. Describe the difference between possible and probable. (MP1)

Grade	Anchor Standard	Code	Benchmark
2	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.11.1	1. Calculate how money saved or earned can accumulate into a larger amount over time. (MP8) {CC2}
2	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	2.11.2	2. Identify pennies, nickels, dimes and quarters. Find the value of a group of coins and determine combinations of coins that equal a given amount, using $ and ¢ symbols appropriately. (MP7)
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.1	1. Read and write whole numbers from zero to 100,000 using base-ten numerals, number names and expanded form. (MP4, MP6)
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.2	2. Use place value to describe whole numbers from zero to 100,000 in terms of 10 thousands, thousands, hundreds, tens and ones. Use place value understanding to round whole numbers to the nearest 10, 100, 1,000. (MP1)
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.3	3. Compare and order whole numbers up from zero to 100,000 based on meanings of the digits in each place, using >, = and < symbols to record the results of comparisons.(MP4)

Grade	Anchor Standard	Code	Benchmark
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.4	4. Estimate sums and differences within 1,000 using strategies based on place value, approximation, properties of operations and/or the relationship between addition and subtraction to assess the reasonableness of results. (MP2) {CC1, CC2}
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.5	5. Multiply one-digit whole numbers by multiples of 10 and 100 (e.g., 9 × 80, 5 × 600) using strategies based on place value, repeated addition and properties of operations. (MP7, MP8) {CC2}
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.6	6. Write numerical equations to represent and solve single step multiplication and division word problems including equal group, array, area and multiplicative comparison. (MP8) {CC1, CC2}
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.7	7. Compose fractions from unit fractions. Compose and decompose fractions. (MP8)
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.8	8. Read and write fractions up to one whole with words and symbols. Recognize that fractions can be used to represent parts of a whole, points on a number line or distances on a number line. (MP4, MP6) {CC1, CC2}
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.9	9. Justify that the size of a fractional part is relative to the size of the whole through equal partitioning, consideration of the relationship between its numerator and denominator and its relationship to zero and one on the number line. (MP1, MP3)

Grade	Anchor Standard	Code	Benchmark
3	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	3.1.10	10. Apply the concept of numerator and denominator to compare and order unit fractions and fractions with like denominators up to one whole. (MP7)
3	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	3.2.1	1. Justify why the comparison of whole numbers up to 100,000 with an emphasis on place value and equality is true based on place value. (MP3)
3	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	3.2.2	2. Find 100 more or 100 less, 1,000 more or 1,000 less and 10,000 more or 10,000 less than a given four or five-digit number. (MP7)
3	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	3.2.3	3. Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations and/or the relationship between addition and subtraction. (MP7)
3	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	3.2.4	4. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. Know from memory all factors between 0 and 12. (MP7)
3	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	3.2.5	5. Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9×80, 5×60) using strategies based on place value and properties of operations. (MP7)

Grade	Anchor Standard	Code	Benchmark
3	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	3.2.6	6. Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b. (MP4)
3	2. Select and apply procedures accurately, efficientlyand flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	3.2.7	7. Recognize and generate equivalent fractions for halves and quarters. Explain why the fractions are equivalent, using a visual fraction model. (MP6)
3	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	3.2.8	8. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. (MP7)
3	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.3.1	1. Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line and skip counting. (MP8) {CC1, CC2}
3	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.3.2	2. Represent division facts by using a variety of approaches, such as repeated subtraction, equal sharing and forming equal groups. (MP8)
3	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.3.3	3. Justify the inverse relationship between multiplication and division. (MP3)
3	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.3.4	4. Create and describe pattern rules with x and y value of zero that generate patterns by multiplying or dividing by a constant to get the next term. (MP1, MP7) {CC1, CC2}

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3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.1	1. Determine if numerical equations and numerical expressions of whole numbers up to 100,000, using place value and properties of mathematics, are true or false and find the missing value in an open number sentences without carrying out the calculation. (MP2)
3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.2	2. Find a missing value in an up to three-digit whole number addition and subtraction expressions without carrying out the calculation; determine if an equation is true or false and justify your reasoning.** (MP3)
3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.3	3. Represent addition and subtraction numerical expressions and numerical equations up to three-digit whole numbers in a variety of ways, using place value, the properties of algebra and the four operations. (MP4)
3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.4	4. Find a missing value in multiplication and division numerical expressions within 100 without carrying out the calculation; determine if a numerical equation is true or false and justify your reasoning. (MP3)
3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.5	5. Use properties of algebra and the relationship between addition/subtraction and multiplication/division to write equations that support understanding of basic facts with true/false and open number equations. (MP8)

Grade	Anchor Standard	Code	Benchmark
3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.6	6. Decompose and compose fractions and fractions greater than one with expressions and equations using addition and subtraction. Use these numerical expressions and numerical equations to compare fractions that are halves, fourths and eighths. (MP7)
3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.7	7. Write true/false numerical equations and numerical equivalent numerical expressions in a variety of ways, using addition, subtraction and multiplication to expand and simplify problems. (MP8)
3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.8	8. Make conjectures and justifications about multiplication and division involving zero and one with true/false and open number equations. (MP3)
3	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	3.4.9	9. Make conjectures and justifications using the commutative and associative properties of addition and multiplication with true/false and open number equations. (MP3)
3	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.5.1	1. Create, describe and apply single-operation input-output rules involving addition, subtraction and multiplication to solve problems in various contexts.**(MP1) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
3	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.5.2	2. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. For example, observe that four times a number is always even and explain why four times a number can be decomposed into two equal addends. (MP7, MP8) {CC1, CC2}
3	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.5.3	3. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (MP4) {CC1, CC2}
3	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	3.6.1	1. Measure to the nearest half units when measuring distances. (MP2, MP5) {CC2}
3	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	3.6.2	2. Compare and contrast the relative sizes of measurement units within one system (inches and feet, centimeters and meters, grams and kilogram, ounces and pounds) (MP2, MP3, MP5, MP6) {CC2}
3	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	3.6.3	3. Calculate the perimeter of a polygon with whole-number side lengths by adding the lengths of the sides or measuring the distance around using a ruler. (MP4) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
3	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	3.6.4	4. Represent fractions as lengths from 0 on a number line diagram with equally spaced points corresponding to the fraction. (MP4, MP5)
3	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.7.1	1. Identify parallel and perpendicular lines in various contexts, including right triangles. (MP2) {CC1, CC2}
3	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.7.2	2. Describe and classify rectangles, parallelograms and trapezoids, including parallel and perpendicular lines and right angles. (MP1, MP6) {CC2}
3	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.7.3	3. Identify regular and non-regular polygons with a given number of sides or vertices (corners), including triangles, quadrilaterals, pentagons, hexagons and octagons.(MP2) {CC1, CC2}
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.1	1. Describe various 3D shapes using four different color cubes up to five cubes. (MP1, MP6)
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.2	2. Sketch front, top and side views of 3D shapes. (MP5)
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.3	3. Visualize and sketch regular and non-regular polygons with a given number of sides or vertices (corners), including triangles, quadrilaterals, pentagons, hexagons and octagons.(MP2)

Grade	Anchor Standard	Code	Benchmark
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.4	4. Visualize and model relative size of quantities up to 100,000 using number lines and other tools, using 1, 10, 100, 1,000, 10,000 and 100,000. (MP2)
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.5	5. Visualize and model multiplication as equal groups. (MP8, MP2)
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.6	6. Use models, including number lines, to visualize unit fractions up to tenths. (MP7)
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.7	7. Sketch halves, fourths and eighths on number lines, circles and rectangles. (MP4, MP7)
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.8	8. Create a number line to represent fractions, show equivalence and represent whole numbers as fractions. (MP4)
3	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	3.8.9	9. Use models to visualize, order and compare fractions, using informal strategies like common numerator, common denominator, benchmarks and residual thinking. (MP6) {CC2}
3	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.9.1	1. Notice and wonder about data-rich situations or given data sets to ask statistical questions that can be answered with data, with teacher assistance, keeping the type of data needed in mind. (MP7)

Grade	Anchor Standard	Code	Benchmark
3	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.9.2	2. Understand what counts as data and a data set and that there are different data types. (MP1)
3	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.9.3	3. Select, design and conduct data collection using an appropriate method to answer a statistical question and support a claim, including measurement data; and organize data to analyze using various tools and taking into account missing or incomplete data.** (MP1, MP5)
3	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.9.4	4. When using given data, including data from Dakota and Anishinaabe Tribal Nations and other communities, analyze where the data came from, who collected it, its purpose and what and whose perspective may be missing. (MP3)
3	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.9.5	5. Make predictions and recognize that the accuracy of predictions depends on many things, e.g. how much data they have and how accurate it is. (MP4, MP8)
3	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.9.6	6. Create and critically analyze (e.g. find patterns, make predictions and form conclusions about) data visualizations, including but not limited to frequency tables, bar graphs, picture graphs and number line plots having a variety of scale and solve problems.** (MP1, MP3, MP7, MP8)
3	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.9.7	7. Make a data report creatively, e.g a poster, video, in writing, to answer statistical questions, including any changes that could be made and next steps.** (MP6)

Grade	Anchor Standard	Code	Benchmark
3	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	3.9.8	8. Understand how different representations can highlight different aspects of data and that all arguments, including cause-and-effect relationships, should be supported by the data and analyses.** (MP3)
3	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	3.10.1	1. Describe outcomes of events as impossible, certain, probable, not probable, likely, unlikely and equally likely. (MP1, MP4)
3	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.11.1	1. Create a plan for short term and long term saving based on individual/group goals. ** (MP2) {CC1, CC2}
3	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.11.2	2. Identify the costs and benefits of planned and unplanned spending decisions. ** (MP4) {CC2}
3	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	3.11.3	3. Use addition and subtraction with whole numbers within 100 to calculate change up to one dollar in several different ways, using $ and ¢ symbols appropriately. (MP7)

Grade	Anchor Standard	Code	Benchmark
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.1	1. Read and write whole numbers from zero to 1,000,000 using base-ten numerals, number names and expanded form. (MP4, MP6)
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.2	2. Use place value to describe whole numbers from zero 1,000,000 in terms of millions, hundred thousands, ten thousands, thousands, hundreds, tens and ones. Use place value understanding to round whole numbers to the nearest 10, 100, 1,000, 10,000 and 100000. (MP1)
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.3	3. Compare and order whole numbers from zero to 1,000,000 based on meanings of the digits in each place. (MP7)
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.4	4. Estimate sums and differences within 1,000,000, using strategies based on place value, approximation, properties of operations and/or the relationship between addition and subtraction to assess the reasonableness of results. Use the inverse relationship between addition and subtraction and estimates to justify solutions. (MP3) {CC1, CC2}
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.5	5. Flexibly decompose numbers to efficiently multiply whole numbers up to four digits by a one-digit and multiply two two-digit numbers. Justify the calculation by using equations, rectangular arrays and/or area models. (MP3, MP7, MP8)

Grade	Anchor Standard	Code	Benchmark
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.6	6. Use the relationship between multiplication and division to divide whole numbers to the thousands place by one-digit divisors. Divide two-digit divisors that are multiples of 10 by whole numbers to the thousands place. Strategies may include mental strategies, partial quotients, the commutative, associative and distributive properties and repeated subtraction. (MP7, MP8)
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.7	7. Write numerical equations to represent and solve multiplication and division word problems, including problems in which remainders must be interpreted. (MP4) {CC1, CC2}
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.8	8. Read, write, represent and plot on a number line fractional values between zero and three, including mixed numbers and fractions greater than one.
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.9	9. Apply the concept of numerator and denominator to compare and order fractions between zero and three, using strategies like benchmarks, number lines and models. (MP7)
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.10	10. Read and write decimals with words and symbols; use place value and concrete connections to dollars and cents to describe decimals in terms of thousands, hundreds, tens, ones, tenths and hundredths. (MP4, MP6) {CC2}

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4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.11	11. Compare and order decimal values to the hundredths using place value, a number line and models such as dimes, pennies, 10x10 grids and base 10 blocks. Use place value understanding to round decimals to the nearest whole unit and tenth. (MP4)
4	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	4.1.12	12. Recognize the relationship between decimals and fractions. Read and write decimals and fractions in both decimal and fraction notations using words, symbols and expanded form; know the fraction and decimal equivalents half, one quarter and three-quarters. (MP7)
4	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	4.2.1	1. Justify why the comparison of decimals to the hundredths and whole numbers with an emphasis on place value and equality is true. (MP3)
4	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	4.2.2	2. Use an understanding of place value to multiply a number by 10, 100 and 1,000. (MP7)
4	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	4.2.3	3. Fluently add and subtract multi-digit whole numbers. (MP7)

Grade	Anchor Standard	Code	Benchmark
4	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	4.2.4	4. Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Justify the calculation by using equations, rectangular arrays and/or area models. (MP3, MP7)
4	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	4.2.5	5. Solve multi-step, real-world and mathematical problems requiring the use of addition, subtraction and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of technology and the context of the problem to assess the reasonableness of results. (MP4, MP7)
4	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	4.2.6	6. Use strategies and algorithms based on knowledge of place value, equality and properties of operations to divide multi-digit whole numbers by one-digit divisor. Strategies may include mental strategies, partial quotients and the commutative, associative and distributive properties. (MP1)
4	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	4.2.7	7. Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations. Develop a rule for addition and subtraction of fractions with like denominators. (MP3, MP8)
4	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.3.1	1. Describe and demonstrate an understanding of simple multiplicative relationships by using comparative words like double, twice, two times, triple, three times and etc. (MP8) {CC2}

Grade	Anchor Standard	Code	Benchmark
4	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.3.2	2. Determine all factor pairs for a whole number for products 1 to 100. (MP2)
4	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.3.3	3. Recognize that a whole number is a multiple of each of its factors. (MP7)
4	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.3.4	4. Estimate products and quotients of multi-digit whole numbers by using simple multiplicative relationships, approximation and place values to assess the reasonableness of results. (MP1) {CC2}
4	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.3.5	5. Compare and contrast pattern rules that are additive and multiplicative. (MP3, MP6) {CC1, CC2}
4	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.3.6	6. Use equivalent fractions models, such as partitioning or on a number line, to compare and order fractions, using >, = or <. (MP1)
4	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	4.4.1	1. Determine if numerical equations and numerical expressions of whole numbers and decimals to hundredths, using place value, properties of mathematics and the four operations, are true or false and find the missing value in an open number sentences without carrying out the calculation. (MP7)
4	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	4.4.2	2. Represent multiplication up to two-digit by two-digit expressions and equations in a variety of ways, using place value, the properties of algebra and the four operations. ** (MP8)

Grade	Anchor Standard	Code	Benchmark
4	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	4.4.3	3. Represent division expressions and equations of multi-digit whole numbers by one-digit divisor in a variety of ways, using place value, the properties of algebra and the four operations.** (MP8)
4	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	4.4.4	4. Decompose and compose fractions to add and subtract fractions with like denominators and fractions greater than one with numerical expressions and numerical equations. Use these expressions and equations to compare fractions that are halves, thirds, fourths, fifths, sixths, eighths, tenths and twelfths. (MP7)
4	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	4.4.5	5. Represent problems as numerical expressions and numerical equations requiring addition, subtraction and multiplication of multi-digit whole numbers using properties of mathematics and the relationship between addition/subtraction and multiplication/division. (MP8) {CC2}
4	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	4.4.6	6. Write true/false numerical equations and numerical equivalent expressions in a variety of ways, using all four operations, to expand and simplify problems. (MP8)
4	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	4.4.7	7. Make conjectures and justifications about properties of operations, using the properties of algebra. (MP3)

Grade	Anchor Standard	Code	Benchmark
4	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.5.1	1. Create and use input-output rules involving addition, subtraction, multiplication and division to solve problems in various contexts, using input-output tables where x and y values may not be zero.** (MP8) {CC1, CC2}
4	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.5.2	2. Use words to write a rule for multiplicative patterns to solve word problems. Distinguishing multiplicative comparison from additive comparison, using a variety of strategies including, tables, drawings and algebraic equations with a symbol for the unknown number, to represent the problem. (MP7, MP8) {CC2}
4	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.5.3	3. Generate a number or shape pattern that follows a given descriptive rule where x and y values may not be zero. Identify and explain informally apparent features of the pattern that were not explicit in the rule itself. (MP1, MP3) {CC2}
4	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.5.4	4. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (MP5) {CC1, CC2}

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4	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	4.6.1	1. Measure angles with a protractor. (MP5) {CC2}
4	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	4.6.2	2. Classify angles as acute, right and obtuse. (MP1, MP2) {CC2}
4	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	4.6.3	3. Understand that the area of a two-dimensional rectangular figure can be found by counting the total number of same size square units that cover a shape without gaps or overlaps. Use square units to label area measurements. (MP1, MP2) {CC2}
4	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	4.6.4	4. Compare and contrast perimeter and area. (MP2, MP6) {CC1, CC2}
4	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	4.6.5	5. Justify why the area of a rectangle is A=bh or A=lw. Use square units to label area measurements. (MP3)
4	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	4.6.6	6. Find the areas of geometric figures that can be decomposed into rectangular shapes. Use square units to label area measurements.** (MP7)

Grade	Anchor Standard	Code	Benchmark
4	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.7.1	1. Draw points, lines, line segments, rays, angles (right, acute, obtuse) and perpendicular and parallel lines. Identify these in two-dimensional figures. (MP5) {CC1, CC2}
4	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.7.2	2. Describe and classify triangles, including, right, obtuse and acute triangles. Identify that triangles can be sorted by both side lengths and angle size. Understand that attributes belonging to a category of two dimensional figures also belong to all subcategories of that category. (MP1, MP6) {CC1, CC2}
4	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.7.3	3. Describe and classify quadrilaterals in a hierarchy, including squares, rectangles, trapezoids, rhombuses, parallelograms and kites. Understand that attributes belonging to a category of two dimensional figures also belong to all subcategories of that category. (MP1, MP6) {CC1, CC2}
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.1	1. Describe various 3D shapes using four different color cubes up to 10 cubes. (MP1, MP6)
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.2	2. Sketch front, top and side views of 3D shapes of more complex shapes. (MP5)
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.3	3. Determine the number of cubes in a 3D object where not all cubes are visible. (MP5)

Grade	Anchor Standard	Code	Benchmark
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.4	4. Visualize, describe and sketch with a straight edge, protractor and/or technology, quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms and kites. (MP5)
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.5	5. Describe and sketch triangles, including equilateral, right, obtuse and acute triangles. (MP5)
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.6	6. Draw and recognize the nets of cubes. (MP1)
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.7	7. Use the concept of orientation to apply translations, rotations 90 degrees clockwise and counterclockwise and reflections. (MP1)
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.8	8. Visualize and model relative size of quantities up to 1,000,000 using number lines and other tools, using 1, 10, 100, 1,000, 10,000, 100,000 and 1 million. (MP2) {CC2}
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.9	9. Visualize and represent multiplication as a comparison up to 10x10. (MP8, MP2)
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.10	10. Sketch halves, thirds, fourths, fifths, sixths, eighths, tenths and twelfths on number lines, circles and rectangles. (MP4)

Grade	Anchor Standard	Code	Benchmark
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.11	11. Use mental images to estimate sums and differences of fractions.
4	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	4.8.12	12. Visualize and sketch decimals in tenths and hundredths on number lines and 10x10 grids. (MP7, MP2)
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.1	1. Notice and wonder about data-rich situations or given data sets to ask statistical questions that can be answered with data, with teacher assistance, keeping the type of data needed in mind. (MP7)
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.2	2. Understand what counts as data and a data set and that there are different data types. (MP1)
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.3	3. Select, design and conduct a data collection using an appropriate method to answer a statistical question and support a claim, including data collected over a period of time and measurement data; clean and organize data to analyze variability, taking into account missing or incomplete data.** (MP1, MP5)
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.4	4. When using given data, including data from Dakota and Anishinaabe Tribal Nations and other communities, select the appropriate variable to answer the statistical question, analyzing where the data came from, who collected it, its purpose and what and whose perspective may be missing.* (MP3)

Grade	Anchor Standard	Code	Benchmark
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.5	5. Discuss the meaning and types of variables when clustering or regrouping data (limited to two variables). (MP1)
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.6	6. Make predictions and recognize that the reliability and accuracy of predictions depend on many things, e.g. how much data they have and how accurate it is. (MP1, MP4, MP8)
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.7	7. Create and critically analyze data visualizations, including but not limited to tables, bar graphs, timelines, line plots and spreadsheets to support a claim and solve problems.** (MP1, MP3, MP7)
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.8	8. Make a data report creatively, e.g., a poster, video, in writing, to answer statistical questions, including whether the results apply to other groups, any changes that could be made and next steps.** (MP6)
4	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	4.9.9	9. Understand how different representations can highlight different aspects of data and that all arguments, including cause and effect relationships should be supported by the data and analyses.** (MP3)
4	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	4.10.1	1. Classify probability events involving dice, coins, spinners with equal and unequal partitionings and blocks in a bag as impossible, certain, probable, not probable, likely, unlikely and equally likely (MP7)
4	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	4.10.2	2. Use a number line to connect the values of 0 to impossible and 1 to certain. Informally explore likely, unlikely and equally likely using a number line. (MP4)

Grade	Anchor Standard	Code	Benchmark
4	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.11.1	1. Explain that credit is used when wants or needs exceed the ability to pay and that it is the borrower's responsibility to pay it back to the lender, usually with interest.** (MP1) {CC1, CC2}
4	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.11.2	2. Identify decisions involving income, spending, saving, credit and charitable giving. ** (MP4) {CC1, CC2}
4	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.11.3	3. Describe the basic purpose of financial institutions, including keeping money safe, borrowing money and lending. (MP1) {CC1, CC2}
4	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	4.11.4	4. Make change up to $20 dollar, using place values, using $ and ¢ symbols appropriately. (MP7)

Grade	Anchor Standard	Code	Benchmark
5	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	5.1.1	1. Write equations to represent and solve whole number multiplication up to two-digit by three digit factors and division with one or two-digit divisors; word problems involving equal groups, array, areas and multiplicative comparisons. Use the context of problem to accurately report quotients as whole number with a remainder, a fraction or a decimal. (MP4) {CC1, CC2}
5	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	5.1.2	2. Solve real-world and mathematical problems requiring addition, subtraction, multiplication and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology and the context of the problem to assess the reasonableness of results. (MP4) {CC1, CC2}
5	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	5.1.3	3. Determine the relationship between decimals and fractions, using place values, number lines and models. (MP1, MP7)
5	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	5.1.4	4. Read, write, compare, order and generate equivalent values for decimals and fractions to the thousandths place in both decimal and fraction notations including expanded form; know the fraction and decimal equivalents for halves, thirds, fourths, fifths and tenths. (MP7)

Grade	Anchor Standard	Code	Benchmark
5	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	5.1.5	5. Solve multistep word problems using addition and subtraction of decimals, fractions, fractions greater than 1 and mixed numbers, including those involving measurement, geometry and data. Use various strategies, including the inverse relationships between operations and the context of the problem to assess the reasonableness of results. (MP4) {CC1, CC2}
5	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	5.2.1	1. Justify why the comparison of decimals to thousandths whole numbers with an emphasis on place value and equality is true. (MP3)
5	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	5.2.2	2. Find 0.1 more than a number and 0.1 less, 0.01 more than a number and 0.01 less and 0.001 more than a number and 0.001 less than a number. (MP7)
5	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	5.2.3	3. Divide multi-digit numbers up to 2-digit divisor, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms. Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number or a decimal. (MP7)
5	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	5.2.4	4. Fluently multiply multi-digit whole numbers using the standard algorithm. (MP7)

Grade	Anchor Standard	Code	Benchmark
5	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	5.2.5	5. Add and subtract fractions with unlike denominators, including mixed numbers and fractions greater than 1. (MP1)
5	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	5.2.6	6. Add and subtract decimal numbers to thousandths place. Estimate sums and differences of decimals and fractions. Round decimal answers to the nearest tenth or hundredth. (MP2)
5	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.3.1	1. Interpret multiplication as scaling by comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. (MP1, MP8) {CC2}
5	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.3.2	2. Use simple ratio tables with whole numbers to solve problems, using additive and multiplicative reasoning. (MP2) {CC1, CC2}
5	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.3.3	3. Explain why a fraction a/b is equivalent to $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. (MP8, MP3)
5	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	5.4.1	1. Determine if numerical equations and numerical expressions of positive rational numbers, including decimals to the thousandths, are true or false and find the missing value in an open number sentence without carrying out the calculation. (MP7)

Grade	Anchor Standard	Code	Benchmark
5	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	5.4.2	2. Represent division with at most a two-digit divisor numerical expressions and numerical equations in a variety of ways, using place value, the properties of algebra and the four operations. (MP2)
5	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	5.4.3	3. Decompose and compose to add and subtract decimals and fractions with numerical expressions and numerical equations. Use these numerical expressions and numerical equations to compare decimals and fractions. (MP7)
5	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	5.4.4	4. Find a missing value in fraction and decimal addition and subtraction numerical expressions without carrying out the calculation; determine if a numerical equation is true or false and justify your reasoning.** (MP3)
5	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	5.4.5	5. Decompose and compose to show equivalence of positive rational numbers, using the four operations and the properties of algebra. (MP7)
5	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	5.4.6	6. Make informal conjectures and justifications about numerical expressions involving parentheses and the four operations using the properties of operations, decomposition and composition to generate equivalent numerical expression. (MP3)
5	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	5.4.7	7. Represent whole number problems requiring the four operations, using properties of algebra and the relationship between addition and subtraction and multiplication and division. (MP2, MP8)

Grade	Anchor Standard	Code	Benchmark
5	5. Represent and connect mathematical patterns and relationships using verbal descriptions generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.5.1	1. Use a rule or table to represent ordered pairs of positive integers and graph these ordered pairs on a coordinate system, where x and y values may not be zero.** (MP4) {CC1, CC2}
5	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.5.2	2. Generate two numerical patterns using two given rules. Identify and explain apparent relationships between the patterns, using tables or ordered pairs on a coordinate system. (MP1, MP3) {CC2}
5	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.5.3	3. Solve real-world and mathematical problems requiring addition, subtraction, multiplication and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology and the context of the problem to assess the reasonableness of results. (MP3, MP4, MP5) {CC1, CC2}
5	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.5.4	4. Represent real-world and mathematical problems by graphing whole number and half points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation. (MP4) {CC1, CC2}
5	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.5	5.6.1	1. Develop, justify and use formulas to determine the area of triangles, parallelograms and figures that can be decomposed into triangles and parallelograms.** (MP3, MP7) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
5	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.5	5.6.2	2. Use various tools and strategies to measure the surface area of rectangular prisms. (MP5) {CC1, CC2}
5	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.5	5.6.3	3. Understand that the volume of a rectangular prism can be found by counting the total number of same-sized cubic units that fill a shape without gaps or overlaps. Use cubic units to label volume. (MP1)
5	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.5	5.6.4	4. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths or by multiplying the height by the area of the base. Use cubic units to label volume. (MP8) {CC1, CC2}
5	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.5	5.6.5	5. Determine the appropriate unit for reporting the volume of a solid (using centimeters cubed/meters cubed or inches cubed/feet cubed) and volume of liquid using liters/milliliters. (MP1)
5	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	5.6.6	6. Develop, justify and use the formulas V = lwh and V = Bh to determine the volume of rectangular prisms. Justify why B is the area of the base. (MP3, MP8)

Grade	Anchor Standard	Code	Benchmark
5	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.5	5.6.7	7. Compare and contrast perimeter, area and volume and the units that represent each measurement. Determine and justify when to use each measurement. (MP3, MP6) {CC1, CC2}
5	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.7.1	1. Describe and classify the attributes (edges, faces and vertices) of cubes, prisms and pyramids by the number of edges, faces or vertices as well as the types of faces. (MP1, MP6) {CC1, CC2}
5	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	5.8.1	1. Recognize and draw the net for prisms, pyramids, cylinders and cones. (MP1)
5	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	5.8.2	2. Graph points in the first quadrant on the coordinate plane to solve problems. (MP4)
5	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	5.8.3	3. Visualize and model the relative size and multiplicative relationship between places values from thousands to thousandths on a number line and other tools.(MP2)
5	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	5.8.4	4. Visualize and sketch decimals to thousandths on number lines and 10x10 grids. (MP7, MP2)

Grade	Anchor Standard	Code	Benchmark
5	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	5.8.5	5. Draw the line of symmetry on any 2D figure. (MP5) {CC2}
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.1	1. Notice and wonder about data-rich situations or given data sets to ask statistical questions and make predictions that can be answered with data, with teacher assistance, keeping the type of data needed in mind. (MP7)
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.2	2. Understand what counts as data and a data set and that there are different data types. (MP1)
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.3	3. Select, design and conduct a data collection using an appropriate method to answer a statistical question and support a claim, including measurement data; and clean and organize data to make interpreting easier; to analyze variability (range) and measures of center (mean and median), taking into account missing or incomplete data.** (MP5)
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.4	4. When using given data, including data from Dakota and Anishinaabe tribal nations and other communities, select the appropriate variable to answer the statistical question, analyzing where the data came from, who collected it, its purpose and what and whose perspective may be missing.* (MP3)
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.5	5. Discuss the meaning and types of variables when clustering or regrouping data (using multiple variables). (MP1)

Grade	Anchor Standard	Code	Benchmark
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.6	6. Make predictions and recognize that the reliability and accuracy of predictions depend on many things, e.g. how much data they have and how accurate it is. (MP4, MP8)
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.7	7. Create and critically analyze data visualizations using measures of center and spread, including but not limited to double-bar, line graphs and line plots to support a claim and solve problems.** (MP3, MP7)
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.8	8. Make a data report creatively, e.g., a poster, video, in writing, to answer statistical questions, including whether the results apply to other groups, any changes that could be made and next steps.** (MP6)
5	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	5.9.9	9. Understand how different representations can highlight different aspects of data but that all arguments, including cause-and-effect relationships, should be supported by the data and analyses; evaluate the merit of a conclusion from a data set.** (MP3, MP5)
5	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	5.10.1	1. List outcomes from a probability experiment in a frequency table. (MP4) {CC2}
5	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	5.10.2	2. Use the frequency table to make predictions. Place predictions on a number line from 0 to 1 using vocabulary from previous grades.** (MP4) {CC2}

Grade	Anchor Standard	Code	Benchmark
5	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.11.1	1. Identify the advantages and disadvantages of different methods of payment, including check, credit card, debit card and electronic payments.** (MP1, MP3) {CC1, CC2}
5	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.11.2	2. Compare and contrast different ways of paying and receiving payment for goods and services, e.g. debit cards.** (MP1, MP3) {CC1, CC2}
5	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.11.3	3. Explore examples of debt and manageability of debt and its long term impact, e.g. purpose, use, providers and types of credit, long term, short-term debt. (MP4) {CC1, CC2}
5	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	5.11.4	4. Create an individual or group budget based on wants and needs. (MP5) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.1	1. Use positive and negative numbers to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (MP4) {CC1, CC2}
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.2	2. Locate positive and negative rational numbers on a number line and plot pairs of positive and negative rational numbers on a coordinate grid. (MP4)
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.3	3. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3 and that 0 is its own opposite. (MP7)
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.4	4. Interpret statements of inequality (<, >, =) as statements about the relative position of two numbers, including positive and negative rational numbers, on a number line diagram. (MP1) {CC2}
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.5	5. Factor whole numbers; express a whole number as a product of prime factors with exponents. (MP7, MP8)
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.6	6. Determine greatest common factors and least common multiples. Use common factors and common multiples to calculate with fractions and find equivalent fractions. (MP7) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.7	7. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. (MP4, MP7)
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.8	8. Estimate solutions to problems with whole numbers, fractions and decimals and use the estimates to assess the reasonableness of results in the context of the problem. (MP2) {CC1, CC2}
6	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	6.1.9	9. Analyze the change between the extremes of Minnesota's temperatures. (MP1) {CC1, CC2}
6	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	6.2.1	1. Interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions, such as by using visual fraction models to represent the problem leading towards generalizable algorithms. (MP2)
6	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	6.2.2	2. Use the meanings of fractions, multiplication, division and the inverse relationship between multiplication and division to make sense of procedures for multiplying and dividing fractions. (MP8)
6	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	6.2.3	3. Multiply and divide decimals and fractions, using efficient and generalizable algorithms. (MP7)

Grade	Anchor Standard	Code	Benchmark
6	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	6.2.4	4. Solve real-world and mathematical problems requiring arithmetic with decimals, fractions and mixed numbers explaining one's solution {CC2} pathway.* (MP3, MP4)
6	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.3.1	1. Identify and use ratios to compare quantities; understand that comparing quantities using ratios is not the same as comparing quantities using subtraction. (MP1) {CC2}
6	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.3.2	2. Use reasoning about multiplication and division to solve real-world ratio and rate problems, including mixtures and concentrations, by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams or equations. (MP4, MP7) {CC1, CC2}
6	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.3.3	3. Solve problems using the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$, in the context of a ratio relationship including unit pricing and constant speed. (MP4) {CC1, CC2}
6	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.3.4	4. Solve problems involving percentages as a rate per 100, such as finding the part, given a whole and the percentage and find the percentage given the part and the whole. (MP1) {CC1, CC2}
6	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	6.4.1	1. Apply the associative, commutative and distributive properties and order of operations to generate equivalent numerical expressions and to solve problems involving positive rational numbers. (MP1)

Grade	Anchor Standard	Code	Benchmark
6	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	6.4.2	2. Determine equivalences among fractions, decimals and percents; select among these representations to solve problems. (MP7)
6	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	6.4.3	3. Convert between equivalent representations of positive rational numbers. (MP7)
6	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	6.4.4	4. Represent real-world or mathematical situations using expressions, equations and inequalities involving variables and positive rational numbers. (MP4) {CC2}
6	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	6.4.5	5. Solve equations involving positive rational numbers using number sense, properties of arithmetic and the idea of maintaining equality on both sides of the equation. Interpret a solution in the original context and assess the reasonableness of results. (MP3, MP4)
6	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.5.1	1. Understand that a variable can be used to represent a quantity that can change, often in relationship to another changing quantity. Use variables in various contexts. (MP4) {CC2}
6	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.5.2	2. Represent the relationship between two varying quantities with function rules, graphs and tables; translate between any two of these representations. (MP4, MP5) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
6	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	6.6.1	1. Calculate the surface area of rectangular and triangular prisms and use appropriate units, cm2. Justify the formulas used. Justification may involve decomposition, nets or other models.** (MP1, MP3) {CC1, CC2}
6	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	6.6.2	2. Calculate the volume of prisms (including triangular and non-rectangular prisms) and use appropriate units, cm3. Justify the formulas used. Justification may involve decomposition, nets or other models.** (MP1, MP3, MP7) {CC1, CC2}
6	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	6.6.3	3. Solve problems in various contexts involving conversion of weights, capacities, geometric measurements and times within measurement systems using appropriate units. (MP4) {CC1, CC2}
6	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	6.6.4	4. Estimate weights, capacities and geometric measurements using benchmarks in measurement systems with appropriate units. (MP1) {CC1, CC2}
6	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.7.1	1. Solve problems using the relationships between the angles formed by two intersecting lines. (Vertical, complementary, supplementary, adjacent). (MP7) {CC2}
6	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.7.2	2. Determine missing angle measures in a triangle using the fact that the sum of the interior angles of a triangle is 180°. Use models of triangles to illustrate this fact. (MP8, MP2) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
6	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.7.3	3. Decompose polygons into triangles to investigate the sum of the interior angles of polygons.** (MP1, MP7)
6	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	6.8.1	1. Estimate the perimeter and area of irregular figures on a grid when they cannot be decomposed into common figures and use correct units, such as cm and cm2. (MP2)
6	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	6.8.2	2. Find the area of triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. (MP2) {CC2}
6	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	6.8.3	3. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (MP4, MP7) {CC2}
6	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	6.9.1	1. Recognize and formulate statistical investigative questions, with data collection in mind, that compare differences between groups and use categorical and numerical data. (MP1)

Grade	Anchor Standard	Code	Benchmark
6	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	6.9.2	2. Design and conduct investigations and experiments to gather data, while considering cultural perspectives, to answer statistically investigative questions considering variability and justifying choice of variables. (MP3) {CC1, CC2}
6	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	6.9.3	3. Sort, filter and create features to highlight relationships in the data to focus on the appropriate variables for analysis.** (MP5)
6	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	6.9.4	4. Understand that a set of data collected to answer a statistically investigative question has a distribution which can be described by its center, a value summarizing the data with a single number and its variability, which describes how the data varies with a single number. (MP7)
6	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	6.9.5	5. Determine and interpret measures of center (including mean, median and mode) and measures of variability (including range, interquartile range and mean-absolute deviation) and selecting appropriate measures to answer a statistically investigative question. (MP1,MP8)
6	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	6.9.6	6. Create data visualizations to look for patterns, highlight relationships or illustrate features of the distribution of the data to answer or help answer their statistically investigative question.** (MP5, MP7)

Grade	Anchor Standard	Code	Benchmark
6	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	6.9.7	7. Create an infographic about a data set, representing the data in appropriate ways, including in tables, dot plots, stem-and-leaf plots, histograms and box plots and incorporating any other relevant information that helps to tell a story about the data.** (MP1, MP5, MP6)
6	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	6.9.8	8. Explore and share competing explanations for data trends observed, considering cultural perspectives and reasonable alternatives given the variability in findings.* (MP1, MP3, MP6)
6	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	6.10.1	1. Determine the sample space (set of possible outcomes) for a given experiment and determine which members of the sample space are related to certain events. Sample space may be determined by the use of tree diagrams, tables or pictorial representations. (MP1) {CC2}
6	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	6.10.2	2. Determine the probability of an event using the ratio between the size of the event and the size of the sample space; represent probabilities as percents, fractions and decimals between 0 and 1 inclusive. Understand that probabilities measure likelihood. (MP4)
6	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	6.10.3	3. Perform experiments for situations in which the probabilities are known, compare the resulting relative frequencies with the known probabilities; know that there may be differences.** (MP4) {CC2}

Grade	Anchor Standard	Code	Benchmark
6	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	6.10.4	4. Calculate experimental probabilities from experiments; represent them as percents, fractions and decimals between 0 and 1 inclusive. Use experimental probabilities to make predictions when actual probabilities are unknown.** (MP4) {CC2}
6	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.11.1	1. Apply concepts of unit price to make purchase decisions. (MP4) {CC2}
6	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	6.11.1	2. Apply concepts of percentage including discounts, markups, tips and commission. Problems limited to finding the part, given a whole and the percent. (MP4, MP7) {CC2}
7	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	7.1.1	1. Know that every rational number can be written as the ratio of two integers or as a terminating or repeating decimal. Recognize that π is not rational, but that it can be approximated by rational numbers such as 22/7 and 3.14. (MP8)
7	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	7.1.2	2. Understand that division of two integers will always result in a rational number. Use this information to interpret the decimal result of a division problem when using a calculator. (MP1, MP8)

Grade	Anchor Standard	Code	Benchmark
7	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	7.1.3	3. Locate positive and negative rational numbers on a number line, understand the concept of opposites, show that the number and its opposite have a sum of zero (are additive inverses) and plot pairs of positive and negative rational numbers on a coordinate grid. (MP4)
7	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	7.1.4	4. Compare positive and negative rational numbers expressed in various forms using the symbols < , > , = , ≤ , ≥ . (MP4)
7	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	7.1.5	5. Use real-world contexts and the inverse relationship between addition and subtraction to explain why the procedures of arithmetic with negative rational numbers make sense. (MP3, MP4) {CC1, CC2}
7	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	7.1.6	6. Understand subtraction of rational numbers as adding the additive inverse, p-q = p+(-q). Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in real-world contexts. (MP7, MP8) {CC1, CC2}
7	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	7.2.1	1. Solve real-world and mathematical problems involving adding, subtracting, multiplying and dividing positive and negative rational numbers that are integers, fractions and terminating decimals; use efficient and generalizable procedures; raise positive rational numbers to whole-number exponents. (MP4) {CC2}

Grade	Anchor Standard	Code	Benchmark
7	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.3.1	1. Express a relationship between two variables, x and y, as proportional if it can be written in the form $y/x = k$ or $y = k$x. Distinguish proportional relationships from non-proportional relationships, including relationships where the x and y value are not zero. (MP8)
7	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.3.2	2. Decide whether two quantities are in a proportional relationship including testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. Know how to use graphing technology to examine the relationship between the unit rate and the line for a given scenario.** (MP1) {CC1, CC2}
7	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.3.3	3. Graph proportional relationships, interpreting the unit rate as the constant of proportionality of the graph. Compare two different proportional relationships represented in different ways.. (MP1, MP5) {CC2}
7	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.3.4	4. Solve multi-step problems involving proportional relationships in numerous contexts using models such as tables of equivalent ratios involving scaling up and down, tape diagrams, double number line diagrams or equations.* (MP4, MP7) {CC1, CC2}
7	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.3.5	5. Use dimensional analysis to compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. (MP1, MP4) {CC2}

Grade	Anchor Standard	Code	Benchmark
7	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	7.4.1	1. Use properties of algebra to generate equivalent numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents. Properties of algebra include associative, commutative and distributive laws. (MP1)
7	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	7.4.2	2. Represent real-world or mathematical situations using equations and inequalities involving variables and positive and negative rational numbers. (MP4) {CC2}
7	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	7.4.3	3. Solve real-world or mathematical word problems resulting in two-step equations and inequalities involving variables and positive and negative rational numbers. Graph the solution set of the inequality and interpret the solution in context. (MP4, MP5) {CC2}
7	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	7.4.4	4. Evaluate algebraic expressions, including expressions containing rational numbers, absolute value and whole number exponents, by applying computational hierarchy of operations, at specified values of their variables.** (MP7)
7	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.5.1	1. Represent proportional relationships with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. Determine the unit rate (constant of proportionality or slope) given any of these representations. (MP4, MP5) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
7	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	7.6.1	1. Demonstrate an understanding of the proportional relationship between the diameter and circumference of a circle and that the unit rate (constant of proportionality) is π. (MP1,MP2) {CC1, CC2}
7	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	7.6.2	2. Calculate the circumference and area of circles to solve problems in various contexts. (MP4) {CC1, CC2}
7	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	7.6.3	3. Calculate the arc length and area of sectors of circles (given the central angle) to solve problems in various contexts.* (MP4, MP7) {CC1, CC2}
7	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	7.6.4	4. Calculate the surface area and volume of cylinders and justify the formulas used. (MP3, MP8) {CC1, CC2}
7	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.7.1	1. Describe the properties of similarity, compare geometric figures for similarity and determine scale factors. (MP1, MP6) {CC1, CC2}
7	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.7.2	2. Apply scale factors, length ratios and area ratios to determine side lengths and areas of similar geometric figures. (MP5)

Grade	Anchor Standard	Code	Benchmark
7	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.7.3	3. Use proportional reasoning and ratios to solve problems involving scale drawings and conversions of measurement units. (MP4, MP2) {CC1, CC2}
7	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	7.8.1	1. Graph and describe translations and reflections of figures on a coordinate grid and determine the coordinates of the vertices of the figure after the transformation.* (MP8)
7	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	7.9.1	1. Formulate statistical investigative questions, with data collection considering culture perspectives in mind, that compare differences between groups, require a sample of a population and use categorical and numerical data.* (MP3)
7	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	7.9.2	2. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. (MP2) {CC1, CC2}
7	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	7.9.3	3. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.** (MP1, MP4)

Grade	Anchor Standard	Code	Benchmark
7	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	7.9.4	4. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, variability and overall shape. Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. (MP1, MP7)
7	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	7.9.5	5. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. (MP4, MP8)
7	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	7.9.6	6. Create an infographic about a data set, organizing and presenting the data in appropriate ways, including in tables, circle graphs and histograms and incorporating any other relevant information that helps to tell a story about the data.** (MP5, MP6)
7	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	7.9.7	7. Explore and share competing explanations for data trends observed, considering cultural perspectives and reasonable alternatives given the variability in findings and sampling methods.* (MP1, MP3, MP6)
7	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	7.10.1	1. Calculate probability as a fraction of sample space or as a fraction of area. Express probabilities as fractions, decimals and percents. (MP2)

Grade	Anchor Standard	Code	Benchmark
7	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	7.10.2	2. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times. (MP4)
7	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	7.10.3	3. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. (MP1)
7	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	7.10.4	4. Find probabilities of compound events using organized lists, tables, tree diagrams and/or simulation via a computational tool.** (MP5) {CC2}
7	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	7.10.5	5. Represent sample spaces for compound events by decomposing the events using methods such as organized lists, tables and/or tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.** (MP5)
7	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	7.10.6	6. Design and use a simulation within a computational tool to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?** (MP4) {CC2}

Grade	Anchor Standard	Code	Benchmark
7	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.11.1	1. Apply proportional relationships to solve multi-step financial literacy ratio and percent problems. Examples: simple interest, tax, markups and markdowns, tips and commissions, fees, percent increase and decrease, percent error and distinguish between sales tax and income tax for earned wages. Problems include finding the whole, the part and the percent. (MP4, MP7, MP8) {CC2}
7	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	7.11.2	2. Create a budget for an event and calculate what percentage each category comprises of the total budget. Justify choices of the allocation of the available resources. (MP1, MP4, MP 5) {CC1, CC2}
8	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	8.1.1	1. Classify real numbers as rational or irrational. Know that when a square root of a positive integer is not an integer, then it is irrational. Know that the sum of a rational number and an irrational number is irrational and the product of a non-zero rational number and an irrational number is irrational. (MP1, MP7) {CC1, CC2}
8	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	8.1.2	2. Compare real numbers; locate real numbers on a number line. Identify the square root of a positive integer as an integer, or if it is not an integer, locate it as a real number between two consecutive positive integers. (MP5)

Grade	Anchor Standard	Code	Benchmark
8	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	8.1.3	3. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram and estimate the value of expressions. (MP4)
8	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	8.1.4	4. Know and apply the properties of positive and negative integer exponents to generate equivalent numerical expressions. (MP1)
8	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	8.1.5	5. Express approximations of very large and very small numbers using scientific notation; understand how technology displays numbers in scientific notation. (MP4, MP5) {CC2}
8	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	8.2.1	1. Multiply and divide numbers expressed in scientific notation. Express answers in scientific notation. (MP5) {CC2}
8	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.3.1	1. Identify graphical properties of proportional relationships including slope. Know that the slope equals the rate of change and that the y-intercept is zero when the function represents a proportional relationship. (MP7) {CC2}
8	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.3.2	2. Use linear equations to represent proportional situations involving a constant rate of change, while comparing and contrasting with non-proportional relationships. (MP4, MP8) {CC2}

Grade	Anchor Standard	Code	Benchmark
8	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.3.3	3. Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at *b*. (MP8)
8	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	8.4.1	1. Justify steps in generating equivalent algebraic expressions and identifying the properties used, including the properties of algebra. Properties include the associative, commutative, distributive, identity and inverse laws.(MP1, MP3)
8	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	8.4.2	2. Evaluate algebraic expressions, including expressions containing radicals and absolute values, by applying computational hierarchy of operations, at specified values of their variables. (MP7)
8	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	8.4.3	3. Solve multi-step equations in one variable, including complex equivalent linear expressions. Solve for one variable in a multivariable equation in terms of the other variables. Justify the steps by identifying the properties of equality used. (MP3, MP4)
8	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	8.4.4	4. Create equivalent linear equations including slope-intercept, point-slope and standard forms. (MP7)
8	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	8.4.5	5. Represent relationships in various contexts using multi-step linear inequalities. Solve such linear inequalities using properties of inequalities. Graph the solutions on a number line. (MP4) {CC2}

Grade	Anchor Standard	Code	Benchmark
8	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	8.4.6	6. Represent relationships in various contexts with equations and inequalities involving the absolute value of a linear expression. Solve such equations and inequalities and graph the solutions on a number line. (MP4) {CC2}
8	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	8.4.7	7. Represent relationships in various real-world and mathematical contexts using systems of linear equations. Solve systems of linear equations in two variables symbolically, graphically and numerically.** (MP4, MP5) {CC2}
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.1	1. Analyze visual patterns, linear and non-linear patterns to describe how a pattern is changing, name the #th term and write an equation to generalize the *n*th term. (MP1, MP7) {CC1, CC2}
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.2	2. Represent a function as a relationship between an independent variable and a dependent variable in which the value of the independent variable determines the value of the dependent variable. Use functional notation, such as f(x), to represent such relationships.** (MP5) {CC1, CC2}
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.3	3. Use linear functions to represent relationships in which changing the input variable by some amount leads to a change in the output variable that is a constant times that amount.** (MP8) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.4	4. Identify a function as linear if it can be expressed in the form $f(x) = mx+b$ or if its graph is a straight line. (MP1)
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.5	5. Represent linear functions with tables, verbal descriptions, symbols, equations and graphs; translate from one representation to another. (MP5) {CC2}
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.6	6. Identify how coefficient changes in the equation $(x) = mx + b$ affect the graphs of linear functions. Know how to use graphing technology to examine these effects.** (MP1, MP5) {CC2}
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.7	7. Identify graphical properties of linear functions, including slope, *y*-intercept and x-intercept. Know that the slope (m) equals the rate of change, the y-intercept (b) is the value of the function at x=0 and the x-intercept is the value of the function at f(x)=0. (MP1, MP5) {CC2}
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.8	8. Identify that an arithmetic sequence is a linear function that can be expressed in the form where $f(x) = mx + b$, where $x = 0, 1, 2, 3, \ldots$ (MP1, MP8)

Grade	Anchor Standard	Code	Benchmark
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.9	Identify that a geometric sequence is a non-linear function that can be expressed in the form f(x) = ab^x , where x = 0, 1, 2, 3,…. (MP1, MP8)
8	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.5.10	Represent arithmetic and geometric sequences using equations, tables, graphs and verbal descriptions and use them to solve problems. (MP4)
8	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	8.6.1	1. Informally justify the Pythagorean Theorem and its converse by using measurements, diagrams or computer software. (MP2, MP3) {CC1, CC2}
8	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	8.6.2	2. Apply the Pythagorean Theorem to solve real-world and mathematical problems by determining unknown side lengths in right triangles in two and three dimensions. (MP4) {CC2}
8	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	8.6.3	3. Determine the distance between two points on a horizontal or vertical line in a coordinate system. Use the Pythagorean Theorem to find the distance between any two points in a coordinate system. (MP7) {CC1, CC2}
8	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.7.1	1. Understand and apply the relationships between the slopes of parallel lines and between the slopes of perpendicular lines. Graphing technology may be used to examine these relationships. (MP7, MP2)

Grade	Anchor Standard	Code	Benchmark
8	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.7.2	2. Analyze polygons on a coordinate system by determining the slopes and lengths of their sides. (MP1) {CC2}
8	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.7.3	3. Given a line on a coordinate system and the coordinates of a point not on the line, find lines through that point that are parallel and perpendicular to the given line, using graphing technology or hand drawn graphs. (MP7)
8	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	8.8.1	1. Recognize that the graph of linear equation $y=mx+b$ comes from b units translation of $y=mx$ graph. (MP4)
8	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	8.8.2	2. Recognize that opposite values of m in the linear equation $y=mx+b$ is an application of reflections. (MP7)
8	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	8.8.3	3. Recognize that solutions to a system of two linear equations in two variables correspond to points of intersections of their graphs, because points of intersection satisfy both equations simultaneously. (MP4)
8	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	8.8.4	4. Recognize that a system of linear equations may have no solution, one solution or an infinite number of solutions. Relate the number of solutions to pairs of lines that are intersecting, parallel or identical. (MP2)

Grade	Anchor Standard	Code	Benchmark
8	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	8.8.5	5. Use linear programming (system of inequalities) to solve real-world and mathematical problems and justify the reasonableness of the solutions in context. ** (MP2) {CC2}
8	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	8.9.1	1. Formulate statistical investigative questions. These include questions about variation or the differences between groups and associations between numerical variables. (MP3)
8	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	8.9.2	2. Select and design appropriate studies given the question(s) and context considering the many choices to be made around the process of data collection, including cultural perspectives and how these affect the quality, amount, speed, accessibility and cost of the data collection.* (MP3)
8	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	8.9.3	3. Develop an understanding of the notion of a statistical model. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line and informally assess the model fit by judging the closeness of the data points to the line. (MP1, MP4, MP8)
8	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	8.9.4	4. Construct and interpret scatter plots for bivariate measurement data to investigate patterns, predict outcomes and/or communicate an idea.** (MP1, MP7)

Grade	Anchor Standard	Code	Benchmark
8	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	8.9.5	5. Describe patterns such as clustering, outliers, positive or negative association, linear association and nonlinear association. Consider correlation between variables (make a clear distinction between correlation and causation).** (MP1, MP7)
8	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	8.9.6	6. Answer the statistical investigative question(s) and explore competing explanations for the data trends observed (ex. confounding variables); paying careful attention to what conclusions the data supports, cultural perspectives and the reasonableness of the model's predictions.* (MP3, MP4, MP6) D2) Use the equation of a linear model to solve problems in the context of bivariate measurement data. Interpreting the slope and intercept in context of the variables. (MP4, MP6, MP7)
8	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	8.9.7	7. Create an infographic about a data set, organizing and presenting the data in appropriate ways, including in tables and scatter plots and incorporating any other relevant information that helps to tell a story and support a claim about the data.** (MP1, MP6)
8	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.11.1	1. Solve problems in various contexts involving calculating and comparing simple and compound interest (for compound interest, limited to compounded annually). (MP4, MP7, MP8) {CC2}

Grade	Anchor Standard	Code	Benchmark
8	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.11.2	2. Solve real-world problems comparing how interest rate and loan length affect the cost of credit, by calculating the total cost of repaying a loan, under various rates of interest and over different periods.** (MP4, MP5) {CC1, CC2}
8	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.11.3	3. Use systems of equations in the context of financial literacy using the concept of the break-even point to solve problems. (e.g. profit/cost, cost comparison, supply/demand).** (MP4) {CC1, CC2}
8	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	8.11.4	4. Analyze employment opportunities and their payment methods (e.g. per hour with or without tips, salary, per diem, piecework) to make financially responsible decisions. (MP1, MP4) {CC1, CC2}
9	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	9.1.1	1. Add, subtract, multiply and divide numbers in scientific notation and round answers to the correct number of significant digits. (Maybe this is grade 8) (MP6, MP7) {CC1, CC2}
9	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	9.1.2	2. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. (MP6)

Grade	Anchor Standard	Code	Benchmark
9	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	9.1.3	3. Solve quadratic equations with real coefficients that could have complex solutions. (MP7)
9	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	9.1.4	4. Use matrices to represent data between two or more quantities.** (MP4)
9	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	9.1.5	5. Multiply matrices by scalars to produce new matrices, (e.g., as when all of the payoffs in a game are doubled.) ** (MP4, MP5)
9	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	9.1.6	6. Add, subtract and multiply matrices of appropriate dimensions.** (MP5)
9	1. Determine quantities, relationships between quantities and number systems and their representations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities; relate to the properties of operations; assess reasonableness of the results.	9.1.7	7. Use modulo operation to rewrite decimals (base 10 number system) into base-*n* number system including binary (base 2), octal (base 8) and hexadecimal (base 16).** (MP5) {CC1, CC2}
9	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	9.2.1	1. Assess the reasonableness of a solution in its given context and compare the solution to appropriate graphical or numerical estimates; interpret a solution in the original context. (MP3) {CC2}

Grade	Anchor Standard	Code	Benchmark
9	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	9.2.2	2. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (MP6)
9	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	9.2.3	3. Use the structure of an expression including perfect squares, difference of two squares to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$ (MP7, MP8)
9	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	9.2.4	4. Find and evaluate the composition of two (or more) functions. (MP7)
9	2. Select and apply procedures accurately, efficiently and flexibly to solve mathematical and real-world problems; explaining one's solution pathway. Analyze results, evaluate progress and check answers. Transfer procedures to different problems and contexts; and recognize when one is more strategic to apply than another.	9.2.5	5. Express functions as the composition of simpler functions. (MP4)
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.1	1. Apply the fact that the effect of a scale factor *k* on length, area and volume is to multiply each by *k*, k^2 and k^3, respectively. (MP2) {CC2}
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.2	2. Estimate the number of members of a population with a given characteristic based on the percent of members in a sample. (MP4) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.3	3. Use similarity to appraise the side ratios in right triangles as properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. (MP8)
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.4	4. Develop the concept that the radian measure of an angle is the constant of proportionality. (MP8)
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.5	5. Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.6	6. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. (MP1, MP3) {CC2}
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.7	7. Use the properties of similarity transformations to establish the AA, SAS and SSS similarity criteria for two triangles to be similar. (MP2)

Grade	Anchor Standard	Code	Benchmark
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.8	8. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally and conversely. (MP3)
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.9	9. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures (MP3)
9	3. Represent proportional relationships in mathematical and real-world situations, using graphs, diagrams, tables, symbols and verbal descriptions, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.3.10	10. Solve multi-step problems involving inverse proportional relationships in various contexts involving rates. (MP4) {CC1, CC2}
9	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	9.4.1	1. Add, subtract and multiply polynomials. (MP1, MP7)
9	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	9.4.2	2. Convert between equivalent forms of quadratic expressions (vertex form, general form, factored form and the graph) in order to identify the vertex, line of symmetry and intercepts of the parabola corresponding to a quadratic function, using symbolic and graphical methods. (MP8)
9	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	9.4.3	3. Represent and solve problems in various contexts using linear, exponential and quadratic functions. (MP4) {CC2}
9	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	9.4.4	4. Use the concept of a function as a connection between inputs and outputs to find function values and use function notation.** (MP2)
9	4. Use concepts and properties of equivalence and relational thinking to represent and compare numerical expressions, algebraic expressions or equations.	9.4.5	5. Factor common monomial factors from polynomials, factor quadratic polynomials and factor the difference of two squares. (MP7, MP8)

Grade	Anchor Standard	Code	Benchmark
9	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.5.1	1. Represent and solve problems in various contexts using exponential functions, such as population growth. (MP4) {CC1, CC2}
9	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.5.2	2. Sketch graphs of quadratic, exponential and other functions. Translate between graphs, tables and symbolic representations. Use graphing technology to graph these functions. (MP5)
9	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.5.3	3. Determine how transformations affect the symbolic and graphical forms of a function. Use graphing technology to examine transformations. (MP3)
9	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.5.4	4. Express the terms in an arithmetic or geometric sequence recursively and by giving an explicit (closed form) formula.** (MP8)
9	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.5.5	5. **Describe other patterns of growth recursively like 1+2+3+4… or 1+4+9+16… (MP8)
9	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.5.6	6. Find the domain and range of functions in real-world contexts. Express solutions recognizing that some answers that can be obtained may not be valid, including cases where the function inputs are discrete instead of continuous. (MP4) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
9	5. Represent and connect mathematical patterns and relationships using verbal descriptions, generalizations, tables and graphs. Use representations to solve mathematical and real-world situations, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.5.7	7. Obtain information (such as intercepts, maxima/minima, end behavior) and draw conclusions from graphs of functions and other relations. (MP3) {CC2}
9	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	9.6.1	1. Apply the Pythagorean Theorem (distance formula) to compute perimeters of polygons, areas of triangles and rectangles on coordinate planes. (MP1) {CC2}
9	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	9.6.2	2. Apply properties of special right triangles, including properties of 45°-45°-90° and 30°-60°-90° triangles, to solve problems and logically justify results. (MP1, MP3, MP4) {CC2}
9	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	9.6.3	3. Use trigonometric ratios, Pythagorean Theorem or its converse to solve applied problems involving right triangles, polygons or three dimensional figures that can be decomposed into triangles. (MP4, MP7) {CC2}
9	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	9.6.4	4. Develop, justify and use decomposition to determine the formula for surface areas and volumes of three dimensional shapes including pyramids, cones and spheres. ** (MP1, MP7, MP8, MP6) {CC1, CC2}
9	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	9.6.5	5. Use the formulas for surface areas and volumes of three dimensional figures including cones, pyramids, cylinders and spheres to solve real-world and mathematical problems. (MP4, MP5) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
9	6. Investigate measurement using a variety of tools, units, systems, processes and techniques, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities. Explain and reason with attributes, estimations and formulas. Justify decisions and consider the reasonableness of results.	9.6.6	6. Use units of measure and dimension analysis to solve multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (MP1, MP4) {CC2}
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.1	1. Apply properties of angles, including corresponding, exterior, interior, vertical, complementary and supplementary angles to solve problems and logically justify results. (MP1, MP3)
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.2	2. Apply properties of equilateral, isosceles and scalene triangles to solve problems and logically justify results. (MP1, MP3) {CC1, CC2}
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.3	3. Apply the Pythagorean Theorem and its converse to solve problems and logically justify results.* (Move to Standard 6?) (MP1, MP3) {CC1, CC2}
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.4	4. Apply properties of special right triangles, including properties of 45-45-90 and 30-60-90 triangles, to solve problems and logically justify results. (MP1, MP7) {CC1, CC2}
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.5	5. Apply properties of congruent and similar figures to solve problems and logically justify results. (MP1, MP3) {CC1, CC2} Apply properties such as diagonals, regularity, interior and exterior angle sums, parallel and perpendicular sides to define, classify and solve problems involving quadrilaterals and other polygons. (MP1) {CC1, CC2}

Grade	Anchor Standard	Code	Benchmark
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.6	6. Accurately interpret and use words and phrases such as "if...then," "if and only if," "all," and "not." Recognize the logical relationships between an "if...then" statement and its inverse, converse and contrapositive.** (MP1, MP7,MP6) {CC1, CC2}
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.7	7. Assess the validity of a logical argument and give counterexamples to disprove a statement.** (MP1, MP3) {CC1, CC2}
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.8	8. Construct logical arguments using axioms, definitions, theorems and postulates that clearly justify the reasoning and other results in geometry.** (MP1, MP3, MP6)
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.9	9. Develop a precise geometric model for a complex situation. (MP4) {CC2}
9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.10	10. Identify and describe relationships among inscribed angles, radii and chords. Include the relationship between central, inscribed and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle. (MP5) {CC1, CC2}

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9	7. Analyze characteristics of geometric shapes to make mathematical arguments and justifications about geometric relationships. Use visualization and geometric modeling to solve problems, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.7.11	11. Describe the relationships of angles formed outside the circle for both secants and tangent lines. (MP7) {CC2}
9	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	9.8.1	1. Use compass and straightedge to create basic constructions including bisecting segments and angles, parallel and perpendicular lines and regular polygons. (MP5)
9	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	9.8.2	2. Make formal geometric constructions with a variety of tools and methods to include but not limited to compass and straightedge, string, reflective devices, paper folding, Mira, dynamic geometric technology, to represent transformations in the plane and enhance student understanding of two dimensional shapes and their properties. (MP5)
9	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	9.8.3	3. Create and compare rigid and non-rigid transformations and connect it to congruence. (MP2)
9	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	9.8.4	4. Develop a procedure that shows various sequences of transformations to apply reflection, rotation and/or translation of geometric figures that will transform a preimage onto the same image. ** (MP8)
9	8. Develop mental images and spatial sense of quantity, shape, location and orientation to make estimates, distinguish patterns and reason with relationships. Apply concepts and properties of space, tools of representation, processes of reasoning and communicate solutions.	9.8.5	5. Draw the line of symmetry on graphs of functions including parabolas, other even functions and inverse relations. (MP5)

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9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.1	1. Formulate statistical investigative questions and/or pose hypotheses. These include questions about variation or the differences between groups, associations between numerical variables and/or questions that require pairing together multiple analyses or measures to answer. Justify the impact of sampling methods, bias and the phrasing of questions (MP1)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.2	2. Select and design appropriate studies given the question(s) and context. (MP1)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.3	3. Recognize there are many choices to be made around the process of data collection and these affect the quality, amount, speed, accessibility and cost of the data collection. (MP5)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.4	4. Use computational tools to clean, organize and prepare data for analysis, including addressing/removing incorrect data, sub-setting, filtering, creating new variables or composite measures.** (MP5)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.5	5. Attend to issues of bias by considering collection methods and cultural perspectives. (MP3)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.6	6. Recognize the purposes of and differences among sample surveys, experiments and observational studies; explain how randomization relates to each. (MP1, MP3)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.7	7. Compute (using technology) and interpret the correlation coefficient of a linear fit. (MP1, MP5)

Grade	Anchor Standard	Code	Benchmark
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.8	8. Create computational models including a variety of functions that represent relationships among different elements of the data to predict outcomes or communicate an idea in the context of the data.** (MP4, MP8)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.9	9. Refine computational models to consider which data points are relevant, how data points relate to each other and if the data is accurate.** (MP4)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.10	10. Use mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets or tables to estimate areas under the normal curve. (MP1, MP5)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.11	11. Make inferences using statistics about population parameters based on a random sample from that population. (MP3)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.12	12. Use statistics appropriate to the shape of the data distribution to compare the center and spread of two or more different data sets. (MP4)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.13	13. Use technology to create data displays, measures of center and spread including standard deviation to describe statistical relationships. (MP1)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.14	14. Identify and create a statistical model with linear, exponential or power functions. (MP4)

Grade	Anchor Standard	Code	Benchmark
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.15	15. Recognize correlation between variables (make a clear distinction between correlation and causation) to fit regression models, examine residuals, make associations within multivariable datasets. (MP4)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.16	16. Respond to differing arguments or interpretations of the data of different community groups and explore competing explanations for the data trends observed (ex. confounding variables); paying careful attention to what conclusions the data supports. (ensure the conclusion is supported by the data) (MP1, MP3, MP6)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.17	17. Display, analyze and interpret data using various measures such as difference in shapes, center and spread to draw conclusions, identify trends and describe relationships, accounting for possible effects of extreme data points (outliers). (MP1)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.18	18. Evaluate reports based on data published in the media by identifying the source of the data, the design of the study and the way the data are analyzed and displayed. Use interactive data visualizations to support and influence different points of view. Know how to use spreadsheet tables and graphs or graphing technology to recognize and analyze distortions in data displays.** (MP3, MP7)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.19	19. Identify and explain misleading uses of data; recognize when arguments based on data confuse correlation and causation. (MP3, MP6)

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9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.20	20. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal and conditional relative frequencies). Recognize possible associations and trends in the data. (MP4)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.21	21. Compare two treatments using data from a randomized experiment; use simulations to decide if differences between parameters are significant. (MP4)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.22	22. Using statistics as a process for making inferences about population parameters based on a random sample from that population. (MP2)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.23	23. Represent data with plots on the real number line (dot plots, histograms and box plots). (MP6)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.24	24. Represent data on two quantitative variables on a scatter plot and describe how the variables are related. (MP4) a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.* b. Informally assess the fit of a function by plotting and analyzing residuals.

Grade	Anchor Standard	Code	Benchmark
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.25	25. Fit a linear function for a scatter plot that suggests a linear association. (MP4)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.26	26. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. (MP6)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.27	27. Decide if a specified model is consistent with results from a given data-generating process. (MP4, MP3,MP6)
9	9. Identify, formulate and investigate statistical questions by collecting data considering cultural perspectives, analyzing and interpreting data and communicating the results.	9.9.28	28. Estimate a population mean or proportion~~;~~ using data from a sample survey; develop a margin of error through the use of simulation models for random sampling. (MP4)
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.1	1. Select and apply counting procedures such as the multiplication and addition principles and tree diagrams to determine the size of a sample space (the number of possible outcomes). (MP1, MP7)
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.2	2. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections or complements of other events (“or,” “and,” “not”) in Venn diagrams.** (MP1)
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.3	3. Apply probability concepts such as intersections, unions and complements of events and conditional probability and independence, to calculate theoretical probabilities and solve problems.** (MP4) {CC2}

Grade	Anchor Standard	Code	Benchmark
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.4	4. Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes. (MP4)
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.5	5. Use random numbers generated by technology or a spreadsheet, to perform probability simulations and to introduce fairness into decision making. (MP4)
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.6	6. Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B) and interpret the answer in terms of the model. (MP4, MP7)
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.7	7. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. (MP4, MP5) {CC2}
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.8	8. Explain the recursion in Pascal's triangle and how it relates to coin flips, subsets, binomial expansion.** (MP8)
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.9	9. Analyze decisions and strategies using probability concepts.(MP1) {CC2}
9	10. Apply and explain the concepts of probability to interpret data and make informed decisions to solve mathematical and real-world problems.	9.10.10	10. Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. (MP4) {CC2}

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9	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.11.1	1. Define the compounding of annual interest according to a recursive process and use the recursive process to derive the formula $A = P(1 + \frac{r}{n})^t$.** (MP1, MP8) {CC2}
9	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.11.2	2. Define the compounding of interest n times per year according to a recursive process and use the recursive process to derive the formula $A = P(1 + \frac{r}{n})^{nt}$.** (MP1, MP8) {CC2}
9	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.11.3	3. Use technology including spreadsheets to compute the time it takes to pay off a loan given the interest rate, loan amount and monthly payment. Compare the time needed for various monthly payments and various interest rates.(MP4, MP5) {CC2}
9	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.11.4	4. Use technology including spreadsheets to compute the total payments to pay off a loan given the interest rate, loan amount and monthly payment. Compare the total payments for various monthly payments and various interest rates.(MP4, MP5) {CC2}

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9	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.11.5	5. Use technology including spreadsheets to compute the unit cost / total cost to cover different areas and volumes in applications such as painting, carpeting, gardening; optimizing costs for various models including linear or quadratic.(MP4, MP5) {CC2}
9	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.11.6	6. Compare the implications and benefits of different types of loans over the long term including student loan, car loan or home mortgage. (MP1, MP3) {CC1, CC2}
9	11. Explore and analyze financial problems using appropriate technology tools. Apply mathematical concepts to make informed decisions about how to earn, track, save, borrow, share and invest money, while considering a range of acceptable solutions as well as constraints which may affect individual and generational wealth, in various cultures, especially in historical and contemporary Dakota and Anishinaabe communities.	9.11.7	7. Use repeated percentages to determine the final cost after multiple discounts and taxes. (MP8) {CC2}