Essential Standards Extended Guide

Grade 4 Mathematics

GUIDING INFORMATION

In response to requests from schools and districts for guidance on essential standards, committees of educators from around Idaho collaborated in the summer of 2024 to categorize mathematics standards into four groups:

- **Essential standards** are explicitly taught, assessed multiple times, and receive targeted interventions for students who have not yet reached proficiency.
- **Supporting standards** are taught to reinforce essential standards and may or may not be formally assessed.
- **Additional standards** extend learning and are incorporated as time allows within course units, with assessment being optional.
- **Mathematical Big Ideas** are overarching mathematical concepts that are central to the learning of mathematics and link numerous mathematical understandings into a coherent whole. They are difficult to assess.

This guidance helps LEAs prioritize the most critical standards, recognizing that not all standards are of equal importance. This document serves as a resource—not a mandate—to assist local efforts. Importantly, this work did not remove or revise any of the adopted Idaho Content Standards and is intended to refocus time and effort.

The 2022 Idaho Content Standards for Mathematics list the standards for each grade level by domain and provide clarification statements and examples of individual standards. This *Essential Standards Extended Guide* provides examples of how teachers can group standards for mathematics instruction. Appendix A provides planning templates for using these instructional groupings to plan instructional calendars and units.

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Instructional Grouping 1: Addition and Subtraction with Multi-digit Whole Numbers

Mathematical Big Ideas:
- ☐ **4.OA.A. Use the four operations with whole numbers to solve problems**.
- ○ **4.OA.C. Generate and analyze patterns.**
- ☐ **4.NBT.A. Generalize place value understanding for multi-digit whole numbers, less than or equal to 1,000,000.**
- ☐ **4.NBT.B. Use place value understanding and properties of operations to perform multi-digit arithmetic on whole numbers less than or equal to 1,000,000.**

Essential Standards Standards to be explicitly taught, assessed more than once, and intervened upon.
Teacher Note: Students use a progression of physical, visual, and symbolic representations to explain their reasoning strategies. Relate students' physical and visual representations to verbalized and written equations. 4.OA.A.3. Solve multi-step whole-number word problems using the four operations, including problems in which remainders must be interpreted.
4.NBT.B.4. Fluently use the standard algorithm for multi-digit whole-number addition and subtraction.

Supporting Standards Standards that support the learning of essential standards and may or may not be formally assessed.
4.OA.A.3a. Represent these problems using equations with a letter standing for the unknown quantity.
4.OA.A.3b. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.
4.NBT.A.1. Recognize that in a multi-digit whole number, a digit in any place represents ten times as much as it represents in the place to its right.
4.NBT.A.2. Read and write multi-digit whole numbers using standard form, expanded form, and word form. Compare two multi-digit numbers based on meanings of the digits and each place, recording the results of comparisons with the symbols >, =, and <.
4.NBT.A.3. Use place value understanding or visual representation to round multi-digit whole numbers to any place.
Teacher Note: Measurement tasks provide context and visual models for problem solving using the four operations. 4.MD.A.2. Use the four operations to solve word problems involving measurements.   b. Include problems that require expressing measurements given in a larger unit in terms of a smaller unit.

Supporting Standards
Standards that support the learning of essential standards and may or may not be formally assessed.
c.   Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Additional Standards
Standards that deepen learning and may be included as time allows throughout course units of study and may or may not be assessed.
Teacher Note: Geometric constructions with angles provide context and visual images of addition and subtraction. **Mathematical Big Idea:** ○ **4.MD.C. Geometric measurement: Understand concepts of angle and measure angles.**
4.MD.C.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
4.MD.C.5a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle.
4.MD.C.5b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
4.MD.C.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
4.MD.C.7. Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems.
4.MD.C.7a. Use an equation with a symbol for the unknown angle measure.
4.MD.C.7b. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts.

Instructional Grouping 2: Multiplication with Multi-digit Whole Numbers

Mathematical Big Ideas:
- ☐ **4.OA.A. Use the four operations with whole numbers to solve problems**.
- △ **4.OA.B. Gain familiarity with factors and multiples.**
- ○ **4.OA.C. Generate and analyze patterns.**
- ☐ **4.NBT.A. Generalize place value understanding for multi-digit whole numbers, less than or equal to 1,000,000.**
- ☐ **4.NBT.B. Use place value understanding and properties of operations to perform multi-digit arithmetic on whole numbers less than or equal to 1,000,000.**

Essential Standards
Standards to be explicitly taught, assessed more than once, and intervened upon.
Teacher Note: Students use a progression of physical, visual, and symbolic representations to explain their reasoning strategies. Relate students' physical and visual representations to verbalized and written equations. 4.OA.A.3. Solve multi-step whole-number word problems using the four operations, including problems in which remainders must be interpreted.

Supporting Standards
Standards that support the learning of essential standards and may or may not be formally assessed.
4.OA.A.1. Interpret a multiplication equation as a comparison, e.g., $35 = 5 \times 7$, as 35 is 5 times as many as 7. Represent verbal multiplicative comparisons as equations..
4.OA.A.2. Multiply or divide to solve word problems involving multiplicative comparison.
4.OA.3a. Represent these problems using equations with a letter standing for the unknown quantity.
4.OA.3b. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.

4.OA.B.4. Find all factor pairs for a whole number in the range 1–100.
   a. Recognize that a whole number is a multiple of each of its factors.
   b. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number.
   c. Determine whether a given whole number in the range 1–100 is prime or composite.

4.OA.C.5. Generate a number or shape pattern that follows a given rule. Identify and explain features of the pattern that were not explicit in the rule itself.

4.NBT.B.5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.
   a. Use strategies based on place value and the properties of operations
   b. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Supporting Standards
Standards that support the learning of essential standards and may or may not be formally assessed.

Teacher Note: Measurement tasks involving conversion between units of measurement develop conceptual understanding of multiplication and develop proportional reasoning needed in future grades.
 	
4.MD.A.1. Know relative sizes of measurement units within any one system of units.
     a. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit.
     b. Record measurement equivalents in a two-column table.

Teacher Note: Measurement tasks provide context and visual models for problem solving using the four operations.
 	
4.MD.A.2. Use the four operations to solve word problems involving measurements.
     b. Include problems that require expressing measurements given in a larger unit in terms of a smaller unit.
     c. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Instructional Grouping 3: Division with Multi-digit Whole Numbers

Mathematical Big Ideas:

- ☐ **4.OA.A. Use the four operations with whole numbers to solve problems**.
- ○ **4.OA.C. Generate and analyze patterns.**
- ☐ **4.NBT.A. Generalize place value understanding for multi-digit whole numbers, less than or equal to 1,000,000.**
- ☐ **4.NBT.B. Use place value understanding and properties of operations to perform multi-digit arithmetic on whole numbers less than or equal to 1,000,000.**

Essential Standards
Standards to be explicitly taught, assessed more than once, and intervened upon.
Teacher Note: Students use a progression of physical, visual, and symbolic representations to explain their reasoning strategies. Relate students' physical and visual representations to verbalized and written equations.
4.OA.A.3. Solve multi-step whole-number word problems using the four operations, including problems in which remainders must be interpreted.
4.NBT.B.6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors.

Supporting Standards
Standards that support the learning of essential standards and may or may not be formally assessed.
4.OA.A.2. Multiply or divide to solve word problems involving multiplicative comparison.
4.OA.A.3a. Represent these problems using equations with a letter standing for the unknown quantity.
4.OA.A.3b. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.
4.OA.C.5. Generate a number or shape pattern that follows a given rule. Identify and explain features of the pattern that were not explicit in the rule itself.
4.NBT.B.6a. Use strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.
4.NBT.B.6b. Illustrate and explain the calculation by using rectangular arrays, area models, and/or equations.
Teacher Note: Measurement tasks can provide context and visual models for problem solving using the four operations.
4.MD.A.2. Use the four operations to solve word problems involving measurements.   b. Include problems that require expressing measurements given in a larger unit in terms of a smaller unit.

Supporting Standards
Standards that support the learning of essential standards and may or may not be formally assessed.
c. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Instructional Grouping 4: Addition and Subtraction with Fractions

Mathematical Big Ideas:
- ☐ **4.NF.A.** Extend understanding of fraction equivalence and ordering.
- ☐ **4.NF.B.** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- △ **4.MD.A.** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- △ **4.MD.B.** Represent and interpret data.

Essential Standards
Standards to be explicitly taught, assessed more than once, and intervened upon.

Teacher Note: Students use a progression of physical, visual, and symbolic representations to explain their reasoning strategies. Relate students' physical and visual representations to verbalized and written equations. 4.NF.B.3d. Solve word problems involving addition and subtraction of fractions, including mixed numbers, with the same denominator. Justify the conclusions using a visual fraction model and/or verbal reasoning.
Teacher Note: This standard can be integrated into other instructional groupings and into other content areas to help students see and represent their world in mathematical ways. 4.MD.B.4. Make a line plot (dot plot) to show a set of measurements in fractions of a unit $\left(\frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)$. Solve problems involving addition and subtraction of fractions by using information presented in line plots (dot plots).

Supporting Standards
Standards that support the learning of essential standards and may or may not be formally assessed.

4.NF.A.1. Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{n \times a}{n \times b}$ by using visual fraction models, with attention to how the numbers and sizes of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions, including fractions greater than 1.

4.NF.A.2. Compare two fractions with different numerators and different denominators, by creating common denominators or numerators, or by comparing to a benchmark fraction such as $\frac{1}{2}$.
   a. Recognize that comparisons are valid only when the two fractions refer to the same whole.
   b. Record the results of comparisons with symbols $>, =,$ or $<$, and justify the conclusions, by using a visual fraction model and/or verbal reasoning.

4.NF.B.3. Understand a fraction $\frac{a}{b}$ with $a > 1$ as a sum of fractions $\frac{1}{b}$.

Supporting Standards
Standards that support the learning of essential standards and may or may not be formally assessed.
a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify the conclusions by using a visual fraction model and/or verbal reasoning. c. Add and subtract mixed numbers with like denominators by replacing the mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction.
Teacher Note: Measurement tasks can provide context and visual models for problem solving using the four operations with fractions. 4.MD.A.2. Use the four operations to solve word problems involving measurements. a. Include problems involving simple fractions or decimals. b. Include problems that require expressing measurements given in a larger unit in terms of a smaller unit. c. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Instructional Grouping 5: Multiplication with Fractions

Mathematical Big Ideas:

- ☐ **4.NF.B. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.**

Essential Standards Standards to be explicitly taught, assessed more than once, and intervened upon.
Teacher Note: Students use a progression of physical, visual, and symbolic representations to explain their reasoning strategies. Relate students' physical and visual representations to verbalized and written equations. 4.NF.B.4c Solve word problems involving multiplication of a fraction by a whole number e.g., by using visual fraction models and/or equations to represent the problem.

Supporting Standards Standards that support the learning of essential standards and may or may not be formally assessed.

4.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
    a.   Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$.
    b.   Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number.

Teacher Note: Measurement tasks can provide context and visual models for problem solving using the four operations with fractions.
4.MD.A.2. Use the four operations to solve word problems involving measurements.
    a. Include problems involving simple fractions or decimals.
    b. Include problems that require expressing measurements given in a larger unit in terms of a smaller unit.
    c. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Instructional Grouping 6: Introduction to Decimals

Mathematical Big Ideas:

- ☐ **4.NF.C. Understand decimal notation for fractions, and compare decimal fractions.**
- △ **4.MD.A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.**

| **Essential Standards** |
| Standards to be explicitly taught, assessed more than once, and intervened upon. |
| 4.NF.C.7. Compare two decimals to hundredths by reasoning about their size.
  a. Record the results of the comparisons with the symbols $>$, $=$, and $<$, and justify the conclusions using visual representations and/or verbal reasoning. |

| **Supporting Standards** |
| Standards that support the learning of essential standards and may or may not be formally assessed. |
| 4.NF.C.5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. |
| 4.NF.C.6. Use decimal notation to represent fractions with denominators 10 or 100. |
| 4.NF.C.7a. Recognize that comparisons are valid only when the two decimals refer to the same whole. |
| 4.MD.A.1. Know relative sizes of measurement units within any one system of units.
  b. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit.
  c. Record measurement equivalents in a two-column table. |
| *Teacher Note: Measurement tasks provide context and visual models for problem solving using the four operations with decimals.*
4.MD.A.2. Use the four operations to solve word problems involving measurements.
  a. Include problems involving simple fractions or decimals.
  b. Include problems that require expressing measurements given in a larger unit in terms of a smaller unit.
  c. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. |

Instructional Grouping 7: Introduction to Geometry

Mathematical Big Ideas:

- △ **4.MD.A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.**

Essential Standards
Standards to be explicitly taught, assessed more than once, and intervened upon.
Teacher Note: Integrating this standard into Instructional Grouping 2 builds conceptual understanding and spatial visualization of arithmetic operations. 4.MD.A.3. Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.

Supporting Standards
Standards that support the learning of essential standards and may or may not be formally assessed.

4.MD.A.1. Know relative sizes of measurement units within any one system of units.
    a. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit.
    b. Record measurement equivalents in a two-column table.

Additional Standards
Standards that deepen learning and may be included as time allows throughout course units of study and may or may not be assessed.
Teacher Note: After Grade 4, students will begin working with shapes that are not quadrilaterals and classifying shapes based on attributes. These additional standards build vocabulary and concepts for the future study of Geometry. While not listed as essential content, these standards are still important content for fourth grade.

Mathematical Big Idea:

- ○ **4.G.A. Draw and identify lines and angles and classify shapes by properties of their lines and angles.**

4.G.A.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
4.G.A.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
4.G.A.3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Appendix A: Planning Templates

Instructional Calendar Template

Use this template to sequence your instructional units onto a Year At-A-Glance calendar. This template can be adapted to show semesters or trimesters.

Month	Instructional Grouping
August	
September	
October	
November	
December	
January	
February	
March	
April	
May	

Unit Planning Template

Use this template to plan and collaborate around an instructional grouping. This template facilitates identifying curricular and assessment resources to teach and assess the content in one instructional grouping.

Instructional Grouping #:	Unit Topic:
Time Allotment: *How many instructional days do you plan to spend on this topic?*	
Learning Activities: *What common lessons will we teach from our curricular resources?*	
Common Assessments: *What common assessments will we give?* *Consider IAB and FIAB assessments in the ISAT portal if appropriate and common teacher created assessments.*	
Team Collaboration Notes: *What did we learn about teaching this topic from analyzing our student work samples?* *What intervention do we need to do on essential standards? Who is ready for learning additional standards?*	