

A quick guide for observing classroom content and practice

In grade 4, instructional time should focus on three critical areas:

1.

Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends (OA, NBT)

2.

Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers (NF)

3.

Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry (G)

In a 4th grade math class you should observe students engaged with at least one math content and practice standard:

Mathematical Practices

- Making sense of problems and persevering in solving them
- Reasoning abstractly and quantitatively
- Constructing viable arguments and critiquing the reasoning of others
- Modeling with mathematics
- Modeling with mathematics
- Using appropriate tools strategically
- Attending to precision
- Looking for and making use of structure
- Looking for and expressing regularity in repeated reasoning

Content Standards

Operations and Algebraic Thinking (OA)

- Distinguishing multiplicative comparison from additive comparison
- Multiplying or dividing to solve word problems using drawings and equations with a *variable*
- Finding all *factor pairs* for a whole number in the range of 1-100, recognizing *multiples*, and determining *prime* or *composite* numbers
- Generating a number or shape pattern that follows a given rule and explaining informally why it works

Number and Operations in Base Ten (NBT)

- Reading, writing, and comparing multi-digit whole numbers using base ten numerals, number names, and *expanded form*
- Using place value understanding and properties of operations to perform multi-digit arithmetic
- Fluently adding and subtracting multi-digit whole numbers using the *standard algorithm*
- Illustrating and explaining division calculations using equations, rectangular *arrays*, and/or *area models*

Geometry (G)

- Drawing and identifying lines (*parallel* and *perpendicular*) and angles (*right*, *acute*, *obtuse*) and classifying shapes by properties of their lines and angles
- Recognizing a line of *symmetry* for a 2-dimensional figure
- Recognizing angles as geometric shapes, measuring them using protractors, and solving addition and subtraction problems to find an unknown angle

Number and Operations—Fractions (NF)

- Building fractions from *unit fractions* by applying and extending previous understandings of operations on whole numbers
- Understanding addition and subtraction of fractions as joining and separating parts referring to the same whole
- Adding and subtracting mixed numbers with like denominators
- Solving word problems involving addition and subtraction of fractions with like denominators using drawings, visual fraction models, and equations to represent the problem
- Using decimal notation to represent fractions with denominators of 10 or 100 and comparing *decimal fractions*

Measurement and Data (MD)

- Solving problems involving measurement and conversion of measurements from a larger unit to a smaller unit within a single system of measurement
- Applying the *area* and *perimeter formulas* for rectangles in real world and mathematical problems
- Making a *line plot (dot plot)* to display a data set of measurements in fractions of a unit, and using it to solve addition and subtraction problems

Mathematics What to Look For The example below features three Indicators from the [Standards of Effective Practice](#). These Indicators are just a sampling from the full set of Standards and were chosen because they create a sequence: the educator plans a lesson that sets clear and high **expectations**, the educator then delivers high quality **instruction**, and finally the educator uses a variety of **assessments** to see if students understand the material or if re-teaching is necessary. This example highlights teacher and student behaviors aligned to the three Indicators that you can expect to see in a rigorous 4th grade math classroom.

Expectations
(Standard II, Indicator E) Plans and implements lessons that set clear and high expectations and also make knowledge accessible for all students.

What is the teacher doing?

- focusing attention on mathematical language (e.g., linguistic complexity, conventions, and vocabulary)
- establishing classroom routines that support students to communicate their thinking
- establishing classroom routines that support students to defend their thinking
- representing and relating solution methods orally, visually, and with concrete objects

What are the students doing?

- understanding what they will learn in a lesson and how it connects to prior learning
- persisting when engaging with mathematical tasks
- applying mathematical strategies and concepts when engaging with meaningful real-world problems
- using mathematical language precisely to convey meaning and understanding of concepts

Instruction
(Standard II, Indicator A) Uses instructional practices that reflect high expectations regarding content and quality of effort and work; engage all students; and are personalized to accommodate diverse learning styles, needs, interests, and levels of readiness.

What is the teacher doing?

- creating a culture of being careful and precise when communicating mathematical ideas
- providing students with opportunities to apply their learning and solve problems in collaboration with their peers
- highlighting when students draw explicitly upon class content during discussions with peers

What are the students doing?

- drawing explicitly upon content they have learned in class in conversations with peers
- interpreting structures and formulating conjectures about mathematical situations
- explaining how multiple representations of numbers and/or operations relate to one another

Assessment
(Standard I, Indicator B) Uses a variety of informal and formal methods of assessments to measure student learning, growth, and understanding to develop differentiated and enhanced learning experiences and improve future instruction.

What is the teacher doing?

- providing actionable feedback to students about their problem solving processes
- using multiple formative approaches to assess student learning (e.g., student discourse, completion of class work)
- conducting frequent checks for student understanding and adjusting instruction accordingly

What are the students doing?

- engaging in challenging learning tasks regardless of learning needs (e.g., linguistic background, disability, academic gifts)
- using concrete objects, diagrams, and expressions to explore mathematical concepts and relationship
- using exemplars to inform their work