

A quick guide for evaluating classroom content and practice

In grade 8, instructional time should focus on three critical areas:

1.

Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations (EE)

2.

Grasping the concept of a function and using functions to describe quantitative relationships (F)

3.

Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem (G)

In an **8<sup>th</sup> grade math** class you should observe students engaged in 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
- Using appropriate tools strategically
- Attending to precision
- Looking for and making use of structure
- Looking for and expressing regularity in repeated reasoning

## Content Standards

### The Number System (NS)

- Understanding that there are numbers that are not rational and approximating them by *rational numbers*

### Expressions and Equations (EE)

- Working with *radicals* and *integer exponents*
- Understanding the connections between proportional relationships, lines, and *linear equations*
- Graphing *proportional relationships*, interpreting the *unit rate* as the *slope* of the graph
- Analyzing and solving linear equations whose solutions require expanding expressions using the *distributive property* and collecting *like terms*
- Solving *systems* of two linear equations in two variables algebraically (by *graphing*, *substitution* or *elimination*)

### Statistics and Probability (SP)

- Constructing and interpreting *scatterplots* to investigate patterns of association between two quantities
- Using the equation of a linear model to solve problems by interpreting the *slope* and *intercept*

### Functions (F)

- Comparing properties of two *functions* each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)
- Constructing a function to model a linear relationship between two quantities (*rate of change*, *slope*, *initial value*)
- Qualitatively analyzing or sketching a graph to show *increasing/decreasing* or *linear/non-linear* functions

### Geometry (G)

- Understanding *congruence* and *similarity* using physical models, transparencies, or geometry software
- Understanding and applying the *Pythagorean Theorem* in real-world and mathematical problems
- Solving real-world and mathematical problems involving *volume* of *cylinders*, *cones* and *spheres*

NOTES

**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 8<sup>th</sup> 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?**

- Communicating a lesson's objectives and their connections to unit essential questions and goals.
- Creating culturally responsive lessons that engage and sustain student attention
- Focusing attention on mathematical language (e.g., linguistic complexity, conventions, and vocabulary)
- Establishing classroom routines that support students to defend their thinking

**What are the students doing?**

- Applying mathematical strategies and concepts when engaging with meaningful real-world problems
- Using mathematical language precisely to convey meaning and understanding of concepts
- Justifying a solution method and critiquing the reasoning of others
- Identifying important quantities in a given relationship and representing situations. (e.g. using diagrams, or formulas)

**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
- Sharing conflict resolution strategies for working together with students
- Modeling actively incorporating others into discussions

**What are the students doing?**

- Actively incorporating others into discussions about mathematical ideas
- Using equations and diagrams to represent patterns
- Evaluating the relative strengths and weaknesses of solution methods orally and in writing

**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?**

- Using multiple formative approaches to assess students (e.g., mid-unit assessment, group work)
- Conducting frequent checks for student understanding and adjusting instruction accordingly
- Prompting students to explain their reasoning and listening to their responses to identify misconceptions

**What are the students doing?**

- Purposefully incorporating feedback from teacher and peers into actions
- Engaging in challenging learning tasks regardless of learning needs (e.g., linguistic background, disability, academic gifts)
- Using exemplars to inform their work