In **Model Geometry**, instructional time should focus on six critical areas:

1. Developing a foundation for the development of formal proof and using it to prove theorems using a variety of formats.
2. Applying dilations and proportional reasoning to build a formal understanding of similarity.
3. Developing explanations of circumference, area, and volume formulas.
4. Applying the Pythagorean Theorem and continuing their study of quadratics with parabolas.
5. Proving theorems about circles and studying the relationships among parts of a circle.
6. Extending their work with probability and using it to make informed decisions.

### 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

**Number and Quantity (N-Q)**

- Reasoning quantitatively and using units to solve problems *(approximate error, significant figures)* «

**Geometry (G-CO, G-SRT, G-C, G-GPE, G-GMD, G-MG)**

- Experimenting with and drawing transformations *(reflection, rotation, translation)* in terms of angles, circles, perpendicular lines, parallel lines, and line segments, and with rectangles, parallelograms, trapezoids, and regular polygons
- Using geometric descriptions of rigid motions to transform figures and to explore triangle congruence
- Proving geometric theorems, and when appropriate the converse of theorems, for lines, angles, triangles, parallelograms, and polygons *(interior/exterior angles, vertical and corresponding angles, equidistant, bisect)*
- Making formal geometric constructions with a variety of tools and methods
- Using coordinates to prove simple geometric theorems algebraically and using the distance formula to compute perimeters of polygons and areas of triangles and rectangles «
- Explaining volume formulas and using them to solve problems *(dissection arguments, Cavalieri’s principle)* «
- Finding arc lengths and area of sectors of circles *(proportionality)*
- Translating between geometric description and the equation for a conic section *(derive, parabola, focus, directrix)*
- Understanding similarity in terms of similarity in transformations *(dilation, scale factor)*
- Proving similarity theorems and using congruence and similarity criteria for triangles to solve problems and prove relationships in geometric figures
- Defining trigonometric ratios *(sine, cosine, tangent)* and solving problems involving right triangles *(Pythagorean Theorem)* «
- Applying trigonometry to general triangles *(Law of Sines and Cosines)* (+)
- Understanding and applying theorems about circles *(similarity, radii, chords, inscribed and circumscribed angles)*

**Geometry (cont.)**

- Using the rules of probability to compute probabilities of compound events *(Addition Rule, Multiplication Rule, uniform probability model, permutations, combinations)* (+)«

**Statistics and Probability (S-ID)**

- Understanding independence and conditional probability and using them to interpret data from simulations or experiments *(events, subsets, sample space, outcomes, unions, intersections, complements, two-way frequency tables)* «
- Recognizing and explaining the concepts of conditional probability and independence in everyday language and everyday situations «
- Finding the conditional probability of an event as a fraction of another event’s outcomes and interpreting the answer in terms of the model «
- Using the rules of probability to compute probabilities of compound events *(Addition Rule, Multiplication Rule, uniform probability model, permutations, combinations)* (+) «

*NOTES*

- (+) designates a modeling standard
- (+) Designates standards that go beyond course level
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 Model Geometry math classroom.

### Expectations
(Standard II, Indicator E)

**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 using a logical progression of arguments and critiquing the reasoning of others.
- Using sophisticated mathematical models (e.g., computer models).

### Instruction
(Standard II, Indicator A)

**What is the teacher doing?**
- Creating a culture of being careful and precise when communicating mathematical ideas.
- Highlighting culturally appropriate and effective negotiation skills they observe in students.
- Modeling incorporating others into discussions.

**What are the students doing?**
- Actively incorporating others into discussions about mathematical ideas.
- Negotiating with others in response to new ideas, preferences or contributions.
- Evaluating the relative strengths and weaknesses of solution methods orally and in writing.

### Assessment
(Standard I, Indicator B)

**What is the teacher doing?**
- Providing actionable feedback to students about their problem solving processes.
- Using multiple formative approaches to assess students (e.g., mid-unit assessment, group 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 drawings, diagrams, and equations to explain mathematical concepts and relationships.
- Using exemplars to inform their work.