MP6 Attend to precision.

Mathematically proficient students at the elementary grades communicate precisely to others. They start by using everyday language to express their mathematical ideas, realizing that they need to select words with clarity and specificity rather than saying, for example, "it works" without explaining what "it" means. As they encounter the ambiguity of everyday terms, they come to appreciate, understand, and use mathematical vocabulary. Once young students become familiar with a mathematical idea or object, they are ready to learn more precise mathematical terms to describe it.

When making mathematical arguments about a solution, strategy, or conjecture (see MP3), mathematically proficient students learn to craft careful explanations that communicate their reasoning by referring specifically to each important mathematical element, describing the relationships among them, and connecting their words clearly to their representations.

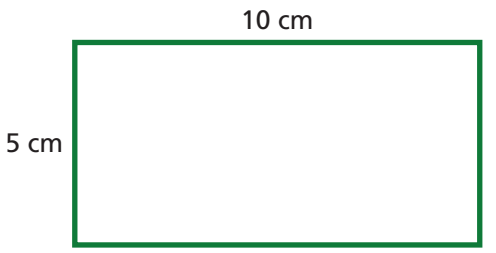
When measuring, mathematically proficient students use tools and strategies to minimize the introduction of error.

(Illustrative Mathematics, *Standards for Mathematical Practice: Commentary* and *Elaborations for K–5*)

Measuring is an important context for attending to precision. Attending to precision in measurement should be a focus for students' work and discussion throughout the unit: What are the appropriate tools for a particular measuring task? What measurement units are appropriate? What strategies can overcome particular measuring challenges? How do you take partial units into account? How can they measure with care and minimize error?

There is a second important emphasis on attending to precision in this unit. Students are engaged in developing precise language to describe, classify, define, explain, and construct arguments. For example, they work on describing the features of individual polygons and of classes of polygons (e.g., trapezoids, parallelograms). They make arguments about dividing polygons into two parts of equal area, and they articulate and justify general strategies for finding the perimeter and area of rectangles.

In Session 1.4, students have just finished discussing their solutions for finding the perimeter of the rectangle in Problem 1 on *Student Activity Book* page 179:



Enrique: The opposite sides are the same length, so there are 2 sides that are 10 centimeters and 2 sides that are 5 centimeters. $10 + 10 + 5 + 5$. It's 30 centimeters.

Andrew: The long side is 10 centimeters and the short side is 5 centimeters. If the ant traveled down those 2 sides it traveled 15 centimeters. If it traveled on the other two sides it would be exactly the same. 2×15 is 30 centimeters.

Teacher: Who can explain why Enrique doubled the 10 and then doubled the 5?

Noemi: Because it's a rectangle, so the top and bottom are the same and the other two are the same.

Teacher: If someone asked you how you can determine the perimeter of a rectangle, what would you say? Is there a general rule we can write that would tell someone else how to find the perimeter of any rectangle?

Ramona: You just have to do 2 times the long side plus 2 times the short side and add them together.

Bill: I did it like Andrew. You can add one side and the other side and then multiply by 2 because there are two sets of that in a rectangle.

Teacher: So what can I write that would tell someone else who hasn't been doing this work with us exactly how to find the perimeter of a rectangle? How can we write a general rule?

Helena: You could say "two times the short side plus two times the long side."

Bill: Or "add one side to the other side and then double that."

Teacher: [who has written down what both Helena and Bill said] So it seems like we have starts for two possible rules. Are these clear enough for someone else to understand?

Luke: I think you can't just say "one side" and "the other side" or people won't know which sides you're talking about.

Teacher: So how can we make clear which sides we mean in Bill's method? Also, how will people know what this rule is for?

Yuson: We could label the sides, like S for "short" and L for "long," or something like that.

As students offer ways to word or notate their rules, the teacher encourages everyone to ask questions and to help revise and clarify their statements. Later, in Investigation 4, students will work in the same way on a formula for area of rectangles. By participating in many discussions like this one, students gain experience in using precise language in mathematics. These discussions also provide an opportunity for the introduction and use of mathematical terms. For example, in this discussion, the teacher might decide to introduce the word "opposite" to describe the pairs of parallel sides in a rectangle. Engaging with the teacher and their peers to articulate mathematical explanations, descriptions, and arguments helps all students attend to precision.

The following chart shows where Mathematical Practice Notes specifically address MP6 and when that mathematical practice is assessed.

MP6 Attend to precision.

SESSION	MPN	ASSESSMENT CHECKLIST
1.2	●	
1.3	●	●
1.4	●	●
1.5	●	●
2.3	●	
3.1	●	
3.3	●	
4.1	●	
4.3	●	●
4.4	●	●
4.5	●	●