

Mathematical Practices

MP1 Make sense of problems and persevere in solving them.

In *Investigations*, this is a core practice essential to all of students' work. Throughout their work, students are coming to understand that mathematics makes sense and developing the confidence and skills to think through unfamiliar and difficult problems.

MP2 Reason abstractly and quantitatively. This practice also focuses on making sense of problems, in particular, moving back and forth between abstract ideas and ways to embody those ideas with images and contexts. Students use story contexts, pictures, and physical models to ground their thinking and also learn to abstract quantities from those contexts and representations in order to reason about them numerically.

MP3 Construct viable arguments and critique the reasoning of others. As students learn how to explain their solutions and justifications so that they communicate clearly to others, they are clarifying their own mathematical understanding. Analyzing and engaging with their classmates' explanations also deepens students' learning.

MP4 Model with mathematics. When students write an equation to represent a story context, they are modeling with mathematics. When they create a table or graph to capture aspects of a set of data, they are modeling with mathematics. Students learn to use mathematics to capture the relationships among mathematical elements of real-world or fantasy situations.

MP5 Use appropriate tools strategically. Throughout their work, students learn to use a repertoire of tools as they solve problems. These include, for example, physical models, pictures and diagrams, measurement tools, and sets of geometric shapes. Students should have access to a range of tools and learn to select which can help them investigate a particular problem.

MP6 Attend to precision. Students work on precision in computation, in measurement, and in articulating conjectures, explanations, and arguments. Constructing clear explanations, both written and oral, provides the opportunity for learning and using mathematical notation and vocabulary.

MP7 Look for and make use of structure. In looking for structure, students are working with foundational ideas that underlie the mathematics they are learning, such as the structure of the base-10 system or the classification of polygons. Seeing structure involves recognizing the same mathematics in different contexts and equivalences among different mathematical objects.

MP8 Look for and express regularity in repeated reasoning. Much of the practice of mathematics is not about solving one individual problem after another, but about looking across sets of related problems. In *Investigations*, students learn to pay attention to commonalities that lead to general ideas about mathematical objects and relationships.