

## Points of Emphasis in M155

A key component of M155 is an emphasis on developing a deep conceptual understanding of trigonometric ratios. Typically when students encounter trigonometric ratios, instructional time is focused on memorization; students memorize each ratio and key values of ratios, which can be done without an understanding of what they mean or why they are constant. By contrast, in M155, students should see right triangle trigonometry as a topic that is logically connected to ideas they have previously encountered. In particular, they should:

- explore measurements of right triangles using rulers, protractors, and other tools (LP 7).
- use repeated reasoning to make generalizations about right right triangles (LP 3).
- be able to explain what trigonometric ratios are using similarity and use that argument to define trigonometric ratios as a property of angles, whose values remain constant (LP 3).

When engaging with trigonometric ratios, student time can also be focused on solving simple one-step problems involving trigonometric ratios, frequently without any contextual meaning. The contextual problems are also often unrealistic. Solving these problems can often involve working with cumbersome tables of ratio values or spending time calculating or solving equations by hand. In M155 by contrast, students should be exposed to multistep problems that involve real-world applications and that use technology as a tool for problem solving. In particular, students should:

- solve multistep contextual problems using trigonometric ratios and explain why solutions are reasonable (LP 1).
- develop equations that represent geometric relationships and explain why they are valid representations (LP 3).
- engage with their peers to explain what a particular trigonometric ratio means and why it is relevant to a problem-solving context (LP 2).
- engage in frequent experiences where they must make sense of given information, construct diagrams, test solution methods, and revise their thinking (LP 1).
- solve problems that explore how right triangle trigonometry is used in different careers (LP 6).
- engage in learning experiences that emphasize reasoning and explanation over performing computations with trigonometric ratios (LP 2).
- employ a variety of tools, such as calculators and geometry software, to solve problems involving trigonometric ratios (LP 7).