

STANDARD FOR MATHEMATICAL PRACTICE

#5

USE APPROPRIATE TOOLS STRATEGICALLY

I'M USING THIS SMP WHEN...

- ✓ I choose the right tools to help me solve problems and understand when each tool works best.
- ✓ I adjust and choose a different tool if the one I'm using doesn't work well.
- ✓ I use estimation and other math knowledge to determine if my answer from a tool is reasonable.
- ✓ I find and use helpful math resources to help me solve problems.
- ✓ I use technology to help me learn more about math and to solve problems more efficiently.

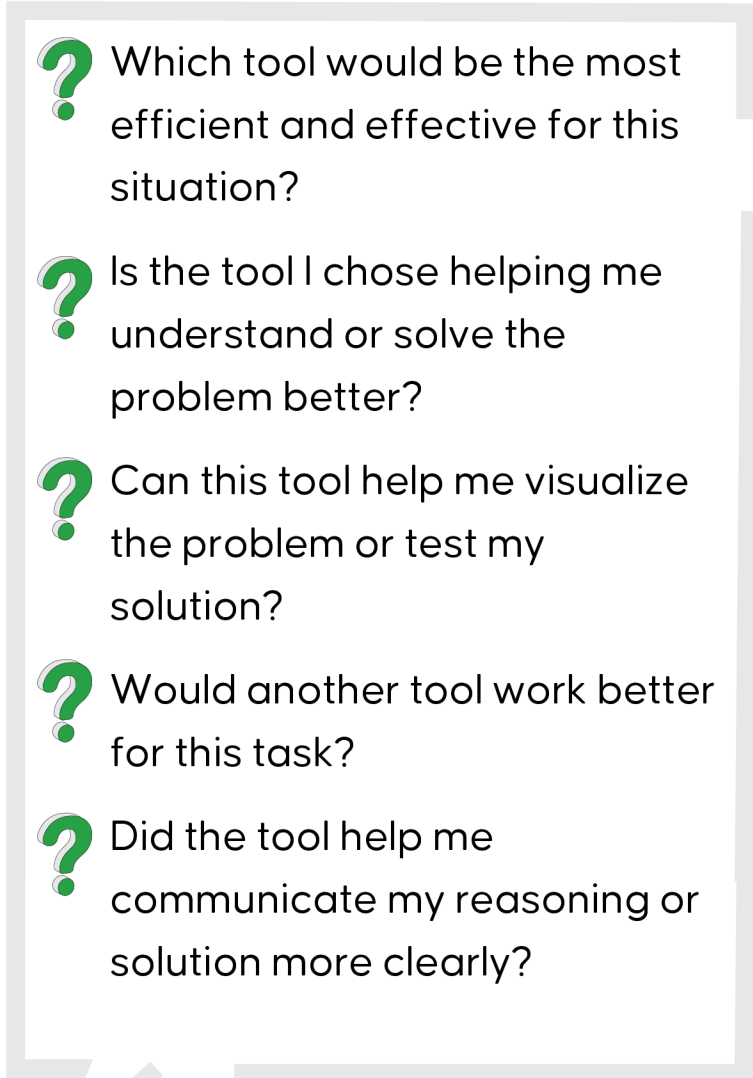
TEACHING ACTIONS TO ENGAGE STUDENTS IN THIS PRACTICE

- Make available and allow students to choose from a variety of tools, such as pencil/paper, physical manipulatives, calculators, rulers, graphs, and digital resources.
- Encourage students to decide which tools are most appropriate for the problem and adjust their choice if needed.
- Provide opportunities for students to use tools to explore mathematical ideas or relationships.
- Demonstrate how tools can make solving problems more efficient or improve accuracy.
- Ask students to evaluate the effectiveness of the tools they chose and consider alternatives.
- Ask students to estimate before using a tool and verify results afterward to ensure reasonableness.

SMP 5: Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package or dynamic geometry software. Proficient students are sufficiently familiar with appropriate tools to make sound decisions about when each of these tools might be helpful, recognizing both the potential for insight and limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know technology can enable them to visualize the results of varying assumptions, explore consequences and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

Kentucky Department of Education (2019, p. 14)

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- ? Which tool would be the most efficient and effective for this situation?
 - ? Is the tool I chose helping me understand or solve the problem better?
 - ? Can this tool help me visualize the problem or test my solution?
 - ? Would another tool work better for this task?
 - ? Did the tool help me communicate my reasoning or solution more clearly?

STUDENT ASK-YOURSELF QUESTIONS

SMP#5