STANDARD FOR MATHEMATICAL PRACTICE #8

LOOK FOR & EXPRESS REGULARITY IN REPEATED REASONING

I'M USING THIS SMP WHEN...

- I notice when I'm doing the same calculation over and over and look for shortcuts.
- I pay attention to both the big idea and the details when solving a problem.
- I understand how patterns work in different situations and see how they are connected.
- I analyze repeated steps in a problem or series of problems to develop equations or general rules.
- I assess my work as I go to make sure my answers make sense and adjust if necessary.

TEACHING ACTIONS TO ENGAGE STUDENTS IN THIS PRACTICE

- Encourage students to generalize from specific examples to broader rules, formulas or algorithms.
- Sequence a series of tasks so that students are doing similar calculations multiple times, leading them to notice emerging patterns and make generalizations and predictions.
- Encourage students to test the validity of their generalizations and predictions, such as by considering a variety of examples, justifying why a process works in general, or finding a counter-example.
- Encourage students to find more efficient methods by recognizing regularity in their reasoning.
- Help students see how repeated reasoning connects to larger mathematical ideas and principles.

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SMP 8: Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated and look both for general methods and shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. . . . As they work to solve a problem, mathematically proficient students maintain oversight of the process while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Kentucky Department of Education (2019, p. 15)

- Am I counting, drawing, building, or calculating the same way each time?
- Is there a pattern or trend in the numbers, symbols, or results?
- Does this pattern always hold true? Why or why not?
- Is there a formula or rule that could represent this process?
- How can I use what I've noticed to solve similar problems more efficiently?

STUDENT ASK-YOURSELF QUESTIONS
Adapted from Kelemanik et al. (2016, p. 179)

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