



SMP 4 - Model With Mathematics

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- 1 SMP- 4 - Model with Mathematics - uses mathematics to make sense of a problem. In this context, the
- 2 word model is not to be confused with using tools and drawings to represent a situation. Instead, the
- 3 practice of modeling in mathematics is a process. Students engaged in modeling are applying their
- 4 knowledge to ask questions about real-world problems.
- 5 When a mathematical situation is posed, students begin by asking their own questions, grounding their
- 6 thinking in the context of the problem. They then make assumptions about the situation by identifying
- 7 information and connections that might be important in answering their questions.
- 8 Students then do the math by translating their ideas into mathematical terms, assessing and analyzing
- 9 their solutions as they go. Because mathematical modeling is a flexible, nonlinear, process, steps can
- 10 be repeated, revisited, or revised as needed in order to refine and share their model. Students may
- 11 need to return to earlier steps as they gain new insights from analyzing their solutions.
- 12 For example, fourth-grade students solving word problems involving liquid volumes might be tasked
- 13 with planning the drinks for a classroom celebration. The teacher might present a container of juice as a
- 14 beginning point for students to begin questioning. Students might ask:
- 15 • How much is a serving?
 - 16 • How many servings do we need?
 - 17 • How many servings are in one container?
- 18 These questions could lead to unit conversions and calculations in order to find a solution.



19 From there, students can continue the modeling process by translating their ideas into mathematical
20 terms using drawings and equations. If their results are unreasonable, they may repeat the process by
21 posing new questions and revising their assumptions.

22 SMP 4 is a learner led process of applying existing knowledge to question and solve real-world
23 problems, which can lead to new learning.