DESK

Mathematical Practices

What Good Mathematicians Do

1. **Make sense of problems and persevere in solving them.**
   Mathematically proficient students…
   a. understand the context of the problem
   b. plan a solution strategy
   c. use manipulatives or pictures to represent the problem
   d. monitor their thinking as they solve the problem
   e. are flexible in approaches to solving problems (when one doesn't work, try another)
   f. make connections to similar problems
   g. determine reasonableness of an answer
   h. understand the strategies of other students
   i. make connections between strategies

2. **Reason abstractly and quantitatively.**
   Mathematically proficient students…
   a. demonstrate number sense
   b. translate concrete and pictorial representations into symbols
   c. provide real-life context for a number expression or equation (e.g. create a story problem for 3 x 5)
   d. recognize the meaning of the answer

3. **Construct viable arguments and critique the reasoning of others.**
   Mathematically proficient students…
   a. formulate an argument (e.g. How did I get my answer? Will this strategy always work?)
   b. communicate their strategy using pictures, numbers, or words
   c. justify their conclusion (i.e. How do I know my answer is correct?)
   d. make conjectures based on what appears to be correct and has not yet been disproven
   e. ask questions of others to clarify thinking
   f. compare effectiveness of strategies

4. **Model with mathematics.**
   Mathematically proficient students…
   a. recognize mathematics in everyday life
   b. make estimations to simplify the situation
   c. use diagrams, graphs, and charts to identify key ideas and draw conclusions

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5. Use appropriate tools strategically.

Mathematically proficient students…

a. effectively use a variety of tools
b. identify which tools are appropriate in a given situation
c. use technology to deepen understanding

6. Attend to precision.

Mathematically proficient students…

a. communicate precisely using symbols or words
b. use vocabulary and commonly agreed upon definitions in discussions
c. calculate accurately and efficiently

7. Look for and make use of structure.

Mathematically proficient students…

a. discern a pattern to identify rules or properties
b. separate complicated ideas into their individual parts

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students…

a. generalize from patterns noticed
b. look for more efficient strategies
c. identify general methods or a general formula
d. evaluate reasonableness while working the problem