

Magnifying Problem Solving in Early Learning Environments

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Highlight the skills students would perform when using this practice standard:

1 Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Can you create at least two *I can* statements for those skills in student-friendly language?

Mathematical Practice Standards in Student-Friendly Language PreK-2

1 Make sense of problems and persevere in solving them.

- *I can explain the meaning of the problem in my own words.*
- *I can analyze what is given, what is not given and the goal of the problem.*
- *I can use a picture or concrete objects to understand and solve the problem.*
- *I can understand the strategies of others.*
- *I can ask myself, does this make sense?*

2 Reason abstractly and quantitatively.

- *I can understand how the numbers in the problem are related.*
- *I can use the units in the problem.*
- *I can use properties of operations.*
- *I can represent the problem with symbols.*

3 Construct viable arguments and critique the reasoning of others.

- *I can explain my reason for my answer.*
- *I can use objects, drawings, tables and actions to represent the problem.*
- *I can listen and respond to the way others solved the same problem.*

4 Model with mathematics.

- *I can solve problems in everyday life.*
- *I can identify important quantities and represent their relationships.*
- *I can simplify a problem.*
- *I can reflect on the results to see if they make sense.*

5 Use appropriate tools strategically.

- *I can learn how to use different mathematical tools.*
- *I can choose the right tools to solve a problem.*
- *I can use estimation to solve a problem or to check my answer.*

6 Attend to precision.

- *I can define the meaning of mathematical symbols.*
- *I can correctly label my diagram, drawings, graphs and units in the answer.*
- *I can explain how I solved a problem using mathematical terms.*

7 Look for and make use of structure.

- *I can find a pattern in a problem.*
- *I can figure out the importance of information in a problem*
- *I can step back and look at the problem in a new way*

8 Look for and express regularity in repeated reasoning.

- *I can look for repeated calculations.*
- *I can create a shortcut.*
- *I can pay attention to details while I think about the goal of the problem.*