Using Children's Literature to Implement the Standards for Mathematical Practice

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Standards for Mathematical Practice in Student-friendly Language

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.*

Why use literature for teaching problem solving?

- Literature can offer examples of real-world mathematics
- Students can discuss and demonstrate how characters use math
- Text can provide common language and context for problem solving situations
- Students can practice applying the practice standards with various books

SMP 1: Make sense of problems and persevere in solving them.

- Content Standard 1.OA: Represent & solve problems involving addition & subtraction.
  - *MATH-Terpieces* by Greg Tang
  - Students explain how they arrived at the sum using two or three addends
  - Create equations to represent sums

SMP 2: Reason abstractly and quantitatively.

- Content Standard 1.OA: Understand and apply properties of operations and the relationship between addition & subtraction.
  - *Ten Flashing Fireflies* by Philomen Sturges
  - Students use pictures to create equations
  - Explore commutative property and “fact families”

SMP 3: Construct viable arguments and critique the reasoning of others.

- Content Standard 1.NBT: Use place value understanding and properties of operations to add & subtract.
  - *Mall Mania* by Stuart J. Murphy
  - Students explore various strategies for addition
  - Practice listening & responding to others

SMP 4: Model with mathematics.

- Content Standard K.OA: Understand addition as putting together & adding to, and understand subtraction as taking apart & taking from.
  - *The Doorbell Rang* by Pat Hutchins
  - Students explain how they divided 12 cookies among various groups of children
  - Use concrete objects, pictures, acting & equations

SMP 5: Use appropriate tools strategically.

- Content Standard 2.NBT: Use place value understanding and properties of operations to add & subtract.
  - *Earth Day Hooray* by Stuart J. Murphy
  - Students explain how they use drawings, objects, mental images and a calculator
  - Explore place value to hundreds

SMP 6: Attend to precision.

- Content Standard 2.G: Reason with shapes and their attributes.
  - *If You Were a Quadrilateral* by Molly Blaisdell
  - Students describe attributes of shapes to determine if they are quadrilaterals
  - Use precise academic language, label drawings and justify answers

SMP 7: Look for and make use of structure.

- Content Standard 1.G: Reason with shapes and their attributes.
  - *The Greedy Triangle* by Marilyn Burns
  - Students explore defining and non-defining attributes of shapes
  - Learn academic language while building shapes
  - Explore structure of # of sides and angles

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

- Content Standard K.CC: Know number names and the count sequence.
  - *Bunches of Buttons* by Michael Dahl
  - Students discover pattern of counting by tens
  - Use repeated calculations to add 10 more to total amount of buttons

- ❖ Put a math curse on your students by reading *The Math Curse* by Jon Scieszka
- ❖ Create a bulletin board or class book with your students' math-related questions
- ❖ Display a math word wall, posters, math-related literature, hands-on materials, and students' math projects in the classroom
- ❖ Combine math with other content areas including art, music and physical education
- ❖ Involve families by assigning real-life math challenges, providing notes with examples and explanations of concepts, and offering workshops on the Common Core
- ❖ Set the tone for mathematical discourse by establishing procedures, prompts and ground rules for sharing and comparing strategies and justifying answers