

# Standards for Mathematical Practice

## Make sense of problems and persevere in solving them



**When presented with a problem, I can make a plan, carry out my plan, and evaluate its success.**

### BEFORE...

**EXPLAIN** the problem to myself.

- Have I solved a problem like this before?

**ORGANIZE** information...

- What is the question I need to answer?
- What is given?
- What is not given?
- What are the relationships between known and unknown quantities?
- What tools will I use?
- What prior knowledge do I have to help me?

### DURING...

**PERSEVERE**

**MONITOR** my work

**CHANGE** my plan if it isn't working out

**ASK** myself, "Does this make sense?"

### AFTER...

**CHECK**

- Is my answer correct?
- How do my representations connect to my algorithms?

**EVALUATE**

- What worked?
- What didn't work?
- What other strategies were used?
- How was my solution similar to or different from my classmates'?

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## Reason abstractly and quantitatively



**I can use reasoning habits to help me contextualize and decontextualize problems.**

### CONTEXTUALIZE

I can take numbers and put them in a real-world context.

For example, if given  
 $3 \times 2.5 = 7.5$

I can create a context:

*I walked 2.5 miles per day for 3 days. I walked a total of 7.5 miles.*

### DECONTEXTUALIZE

I can take numbers out of context and work mathematically with them.

For example, if given  
'I walked 2.5 miles per day for 3 days. How far did I walk?',  
I can write and solve

$3 \times 2.5 = 7.5$

Reasoning Habits include 1) *creating an understandable representation of the problem solved*, 2) *considering the units involved*, 3) *attending to the meaning of quantities*, and 4) *using properties to help solve problems*.

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## Construct viable arguments and critique the reasoning of others



**I can make conjectures and critique the mathematical thinking of others.**

I can **construct, justify, and communicate** arguments by...

- ◆ considering context
- ◆ using examples and non-examples
- ◆ using objects, drawings, diagrams and actions

I can **critique the reasoning of others** by...

- ◆ listening
- ◆ comparing arguments
- ◆ identifying flawed logic
- ◆ asking questions to *clarify or improve arguments*

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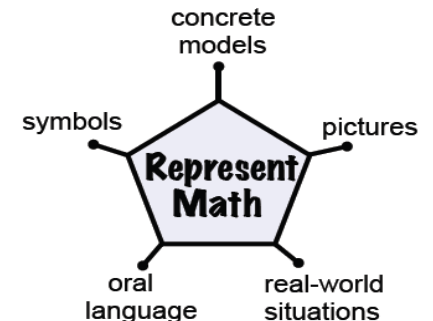
## Model with mathematics



**I can recognize math in everyday life and use math I know to solve everyday problems.**

I can...

- ◆ make assumptions and estimate to make complex problems easier
- ◆ identify important quantities and use tools to show their relationships
- ◆ evaluate my answer and make changes if needed



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## Use appropriate tools strategically

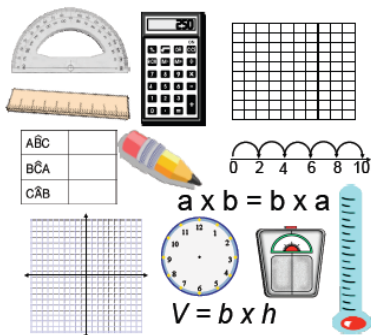


*I know when to use certain tools to help me explore and deepen my math understanding.*

I have a math toolbox.



- ◆ I know **HOW** to use math tools.
- ◆ I know **WHEN** to use math tools.
- ◆ I can reason: "Did the tool I used give me an answer that makes sense?"



## Attend to precision



*I can use precision when solving problems and communicating my ideas.*

### Problem Solving

- ◆ I can calculate **accurately**.
- ◆ I can calculate **efficiently**.
- ◆ My answer matches what the problem asked me to do - **estimate** or find an **exact answer**.

### Communicating

- ◆ I can **SPEAK, READ, WRITE, and LISTEN** mathematically.
- ◆ I can correctly use...
  - math **symbols**
  - math **vocabulary**
  - **units of measure**

## Look for and make use of structure

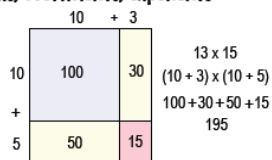


*I can see and understand how numbers and spaces are organized and put together as parts and wholes.*

### Numbers

For Example:

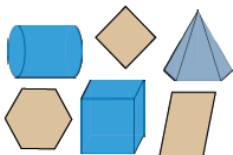
- ◆ Base 10 structure
- ◆ operations and properties
- ◆ terms, coefficients, exponents



### Spaces

For Example:

- ◆ dimension
- ◆ location
- ◆ attributes
- ◆ transformation



## Look for and express regularity in repeated reasoning



*I can notice when calculations are repeated. Then, I can find more efficient methods and short cuts.*

For example:  $25 \div 11$

