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'?

Reason abstractly and quantitatively

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

CONTEXTUALIZE

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

For example, if given
3 x 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 x 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.

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*

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

concrete models

symbols

pictures

Represent Math

oral language

real-world situations
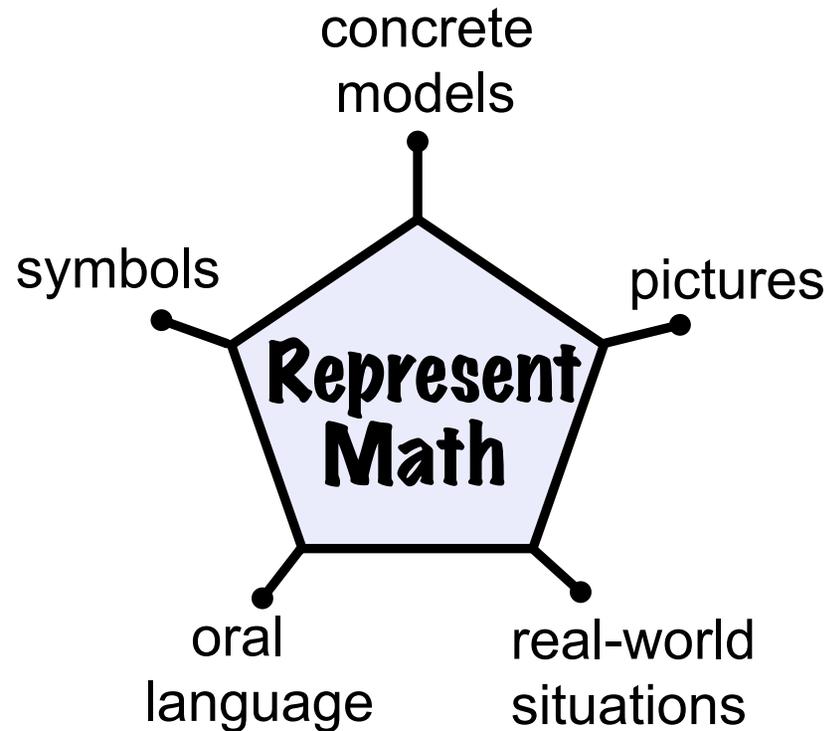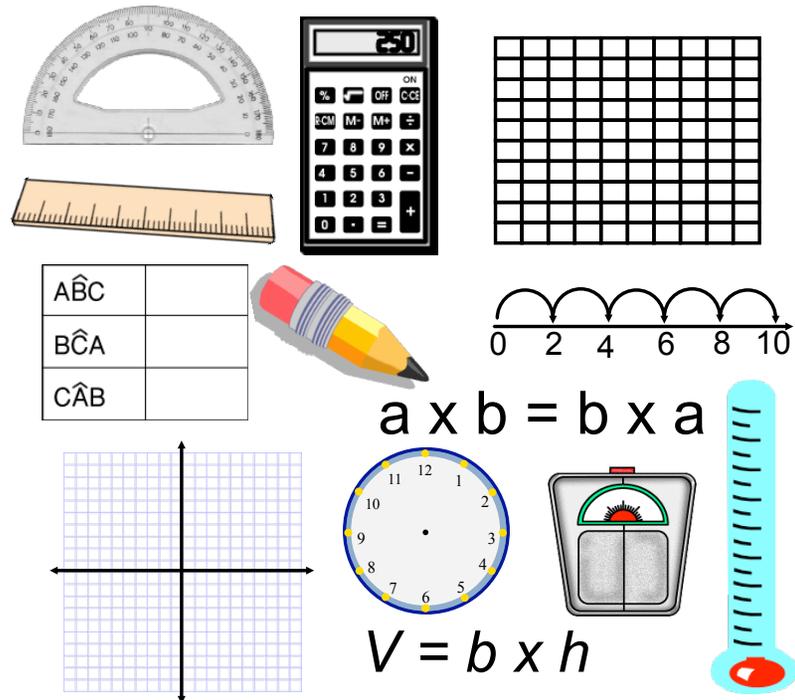
Use appropriate tools strategically

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

I have a <u>math toolbox.</u>

◆ I know <u>*HOW*</u> to use math tools.

◆ I know <u>*WHEN*</u> to use math tools.

◆ I can reason: *"Did the tool I used give me an answer that makes sense?"*

a x b = b x a

V = b x h

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

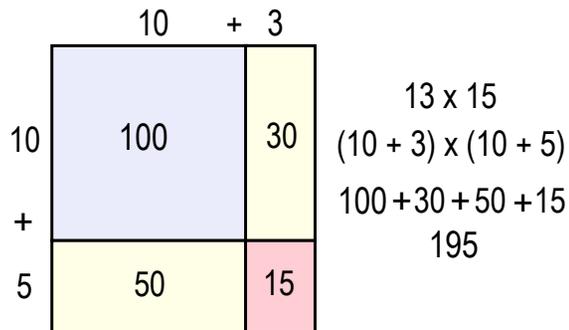# Look for and make use of structure

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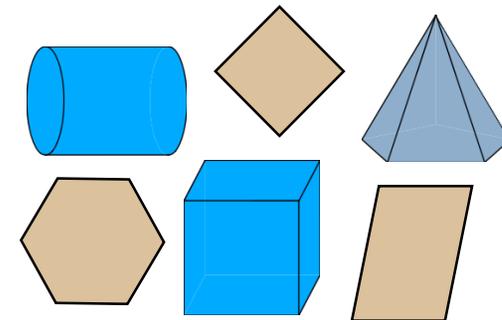
Numbers

For Example:
- Base 10 structure
- operations and properties
- terms, coefficients, exponents

	10	+ 3
10	100	30
+ 5	50	15

13 x 15
(10 + 3) x (10 + 5)

100 + 30 + 50 + 15
195

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 ÷ 11

```
       2.2727
   11 ) 25.0000
       -22
         30
        -22
          80
         -77
          30
         -22
           80
          -77
           30
```

I am repeating this calculation. The quotient is a repeating decimal.