

# Make sense of problems and persevere in solving them.

Mathematical Practice 1



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

## BEFORE...

## DURING...

## AFTER...

**EXPLAIN** the problem to myself.

**MAKE A PLAN** to solve the problem

- *What is the question?*
- *What do I know?*
- *What do I need to find out?*
- *What tools/strategies will I use?*

**PERSEVERE** (Stick to it!)

**MONITOR** my work

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

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

**CHECK**

- *Is my answer correct?*
- *How do my representations connect to my solution?*

**EVALUATE**

- *What worked/didn't work?*
- *How was my solution similar or different from my classmates'?*

# Reason abstractly and quantitatively.

Mathematical Practice 2



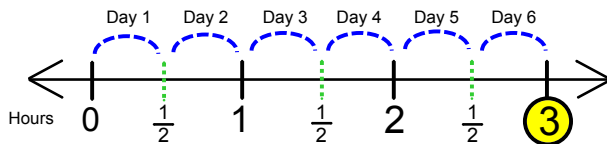
*I can use numbers, words, and reasoning habits to help me make sense of problems.*

**Contextualize** (Numbers to Words)

$$\frac{1}{2} \times 6 = 3 \text{ or } 6 \times \frac{1}{2} = 3$$

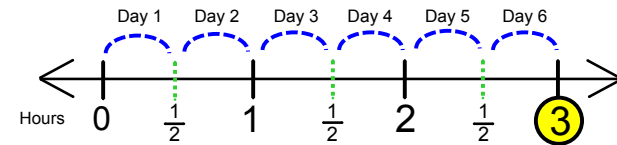


Mary practices the piano  $\frac{1}{2}$  hour a day for 6 days.  
How many total hours does she practice?



**Decontextualize** (Words to Numbers)

Mary practices the piano  $\frac{1}{2}$  hour a day for 6 days.  
How many total hours does she practice?



$$\frac{1}{2} \times 6 = 3 \text{ or } 6 \times \frac{1}{2} = 3$$

## Reasoning Habits

- 1) Make an understandable representation of the problem.
- 2) Think about the units involved.
- 3) Pay attention to the meaning of the numbers.
- 4) Use the properties of operations or objects.

# Construct viable arguments and critique the reasoning of others.

Mathematical Practice 3



*I can make logical arguments and respond to the mathematical thinking of others.*

I can make and present arguments by...

- using objects, drawings, diagrams and actions
- using examples and non-examples
- relating to contexts

I can analyze the reasoning of others by...

- listening
- asking and answering questions
- comparing strategies and arguments

# Model with mathematics.

Mathematical Practice 4



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

**I can...**

My box turtle is getting a new tank. He is 5 1/2" long and 3" tall. One side length of the tank needs to be 5 times his length. How long will the length of the tank need to be?

Use **estimates** to make the problem simpler.

I will round 5 1/2" to 6".

Find **important numbers**.

**Turtle:** About 6" long  
**Tank:** 5 times the length of the turtle

Consider my **answer** --  
**Does it make sense?**

I thought about the problem again and a 30" side length on the tank makes sense!

Think about the **relationship** to find an **answer**.

The tank (30") is 5 times bigger than the turtle length (6").

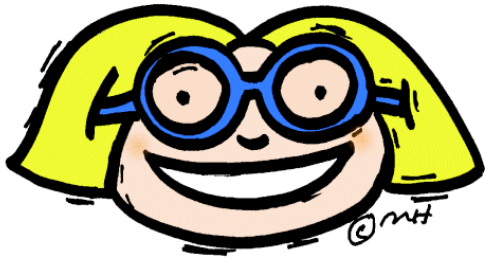
Turtle Length (inches)	Tank Length (inches)
4	20
5	25
6	30
7	35
8	40

Use **tools** to show relationships.

**...to solve everyday problems.**

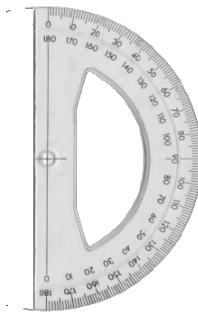
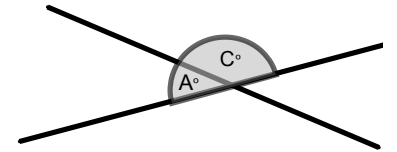
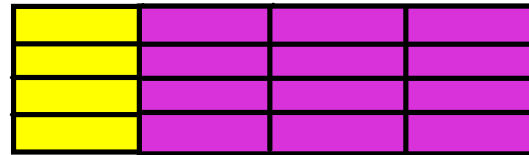
# Use appropriate tools strategically.

Mathematical Practice 5

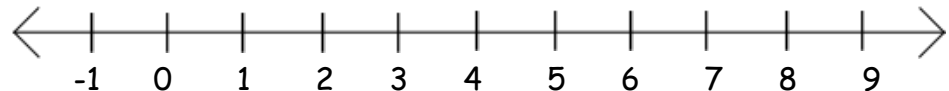
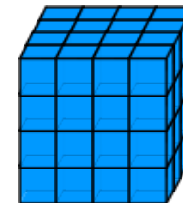


*I can use certain tools to help me explore and deepen my math understanding.*

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



$$a \times b = b \times a$$



# Attend to precision.

Mathematical practice 6



***I can be precise when solving problems and clear when communicating my ideas.***

Mathematicians communicate with others using...

symbol: equal  
(the same as)  
 $48 \text{ inches} = 4 \text{ feet}$   
↑ units of ↓  
measure

- math vocabulary with clear definitions
- symbols that have meaning
- context labels
- units of measure
- calculations that are accurate and efficient

# Look for and make use of structure.

Mathematical Practice 7

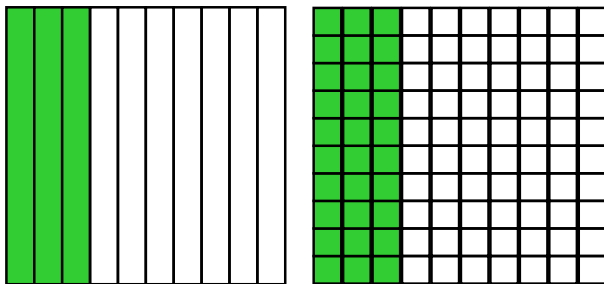


*I can see and understand how numbers and spaces are organized and put together as parts and wholes.*

## Numbers

For Example:

I know that  $\frac{3}{10}$  is equal to  $\frac{30}{100}$ .

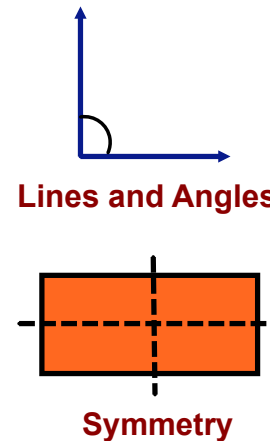


$$\text{So, } \frac{3}{10} + \frac{4}{100} = \frac{34}{100}$$

**Equivalent Fractions**

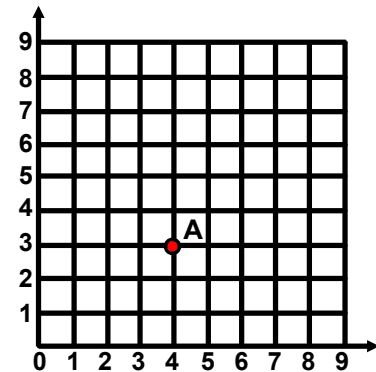
## Spaces

For Example:



**Lines and Angles**

**Symmetry**



**Location**

# Look for and express regularity in repeated reasoning.

Mathematical Practice 8



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

## As I work...

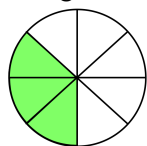
...I think about what I'm trying to figure out while I pay attention to the details

...I evaluate if my results are reasonable.

There are many ways to decompose  $\frac{3}{8}$  because it is composed of repeated  $\frac{1}{8}$  s.

## I CAN.....

...draw a whole and shade in three  $\frac{1}{8}$  s parts.



...add eighths.

$$\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$$

...count by eighths.  
(one-eighth, two eighths, three eighths)

$$\frac{3}{8} = \frac{1}{8}, \frac{1}{8}, \frac{1}{8}$$

...jump three  $\frac{1}{8}$  size jumps on a number line.

