

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 evaluate its success.

BEFORE...

DURING...

AFTER...

EXPLAIN the problem to myself.

- *Have I solved a problem like this before?*

ORGANIZE information...

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

PERSEVERE

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.

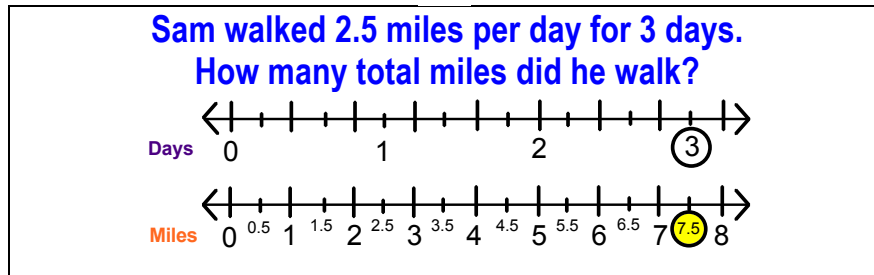
Mathematical Practice 2



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

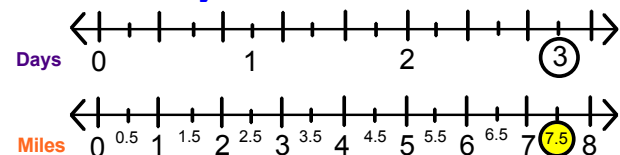
Contextualize

$$2.5 \times 3 = 7.5$$



Decontextualize

Sam walked 2.5 miles per day for 3 days.
How many total miles did he walk?



$$2.5 \times 3 = 7.5$$

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 conjectures and critique the mathematical thinking of others.

I can make, justify (prove), and present arguments by...

- using objects, drawings, diagrams and actions
- using examples and non-examples
- applying context

I can critique the reasoning of others by...

- listening
- asking questions to clarify or improve arguments
- comparing strategies and arguments while identifying flawed logic

Model with mathematics.

Mathematical Practice 4



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

I can...

Kylie needs to read a book with 247 pages in 3 weeks. She's hoping to finish it in 2 weeks. About how many pages does she need to read per day?

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

I will **round** to the whole page.

Find **important numbers**.

Pages to read: **247**
Weeks to read: **2 or 3**

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

The more days Kylie reads, the fewer pages per day she has to read. That makes sense!

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

Kylie will need to read 18 pages per day to finish in 2 weeks and 12 pages per day to finish in 3 weeks.

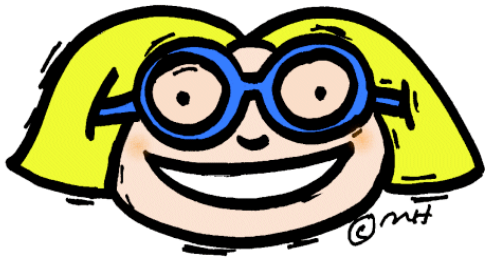
Weeks to read	Pages to read
0	0
1	36
2	18
3	12

Use **tools** to show relationships.

...to solve everyday problems.

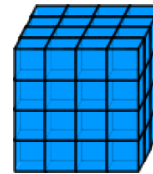
Use appropriate tools strategically.

Mathematical Practice 5



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

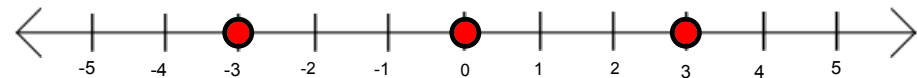
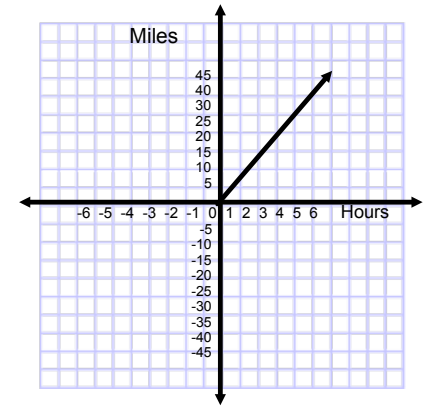
- I know **HOW** and **WHEN** to use math tools.
- I can reason: "Did the tool I used give me an answer that makes sense?"



$$V = b \times h$$

X	Y
1	100
2	200
3	300

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



Attend to precision.

Mathematical practice 6



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

Mathematicians attend to precision by using...

How much chocolate will each person get if 3 people share $\frac{1}{2}$ lb. of chocolate equally?

$$\frac{1}{2} \text{ lb.} \div 3 \text{ people} = \frac{1}{6} \text{ lb. of chocolate each}$$

Diagram illustrating the equation $\frac{1}{2} \text{ lb.} \div 3 \text{ people} = \frac{1}{6} \text{ lb. of chocolate each}$ with annotations:

- symbols**: A blue dashed line with arrows pointing to the fraction $\frac{1}{2}$ and the fraction $\frac{1}{6}$.
- units of measure**: An orange dashed line with arrows pointing to "lb." and "lb.".
- context**: A green dashed line with arrows pointing to "people" and "of chocolate each".

- 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.

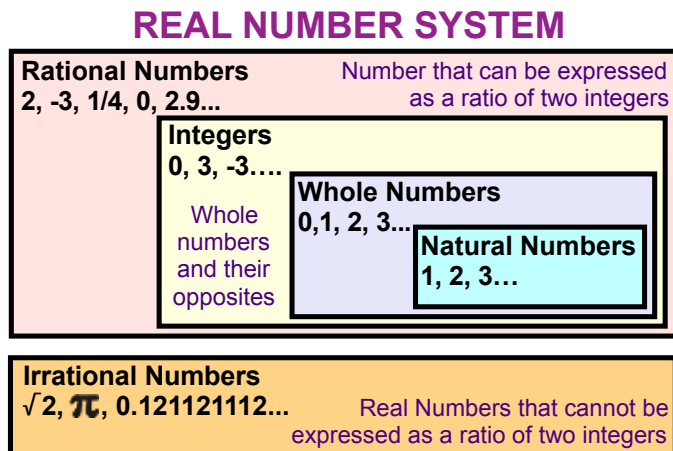
Mathematical Practice 7



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

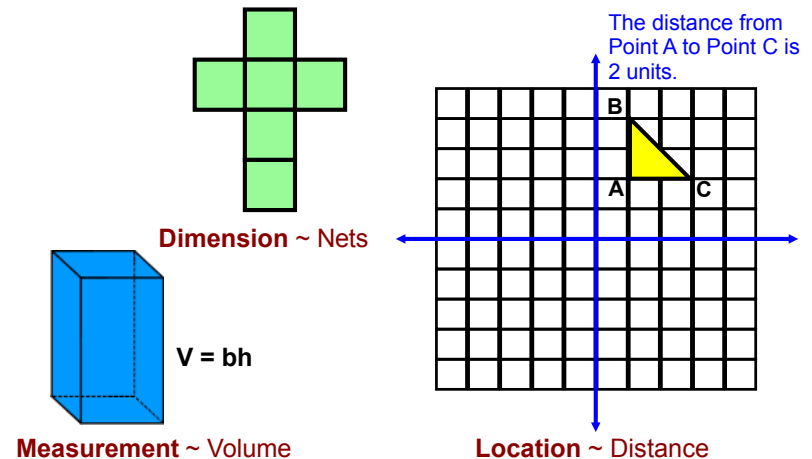
Numbers

For Example:



Spaces

For Example:



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...

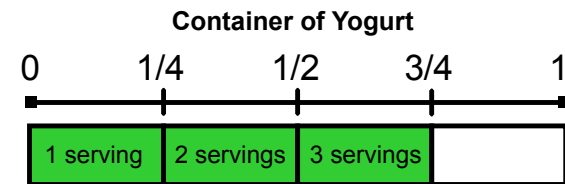
...I think about what I'm trying to figure out while I pay attention to the details.

...I evaluate if my results are reasonable.

EXAMPLE: I have a container of yogurt that is $\frac{3}{4}$ full. One serving of yogurt is $\frac{1}{4}$ of the container. How many servings are left in the container?

(THINK: How many $\frac{1}{4}$'s are in $\frac{3}{4}$'s?)

I can notice that $\frac{1}{4}$ is repeated and draw a model to figure out the number of servings left in the container.



Once I understand division of fractions, I can use a short cut to solve it like this.

$$\frac{3}{4} \div \frac{1}{4} = \frac{3}{4} \times \frac{4}{1} \rightarrow \frac{3}{4} \times \frac{4}{1} = \frac{12}{4} \rightarrow \frac{12}{4} = \frac{3}{1} \rightarrow \frac{3}{1} = 3$$