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

DURING...

PERSEVERE

MONITOR my work

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

CHANGE MY PLAN if it isn't working out

AFTER...

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'?*

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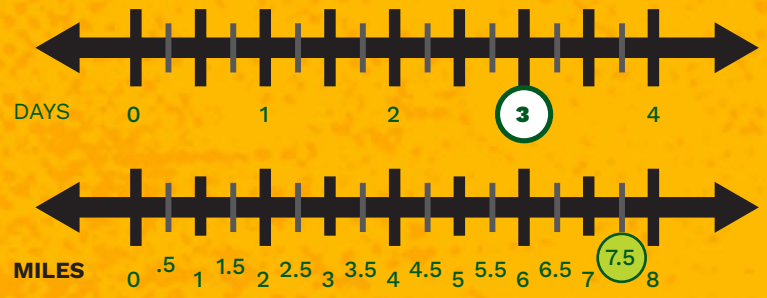
REASON ABSTRACTLY AND QUANTITATIVELY.

CONTEXTUALIZE

2.5 x 3 = 7.5

Sam walked 2.5 miles per day for 3 days.

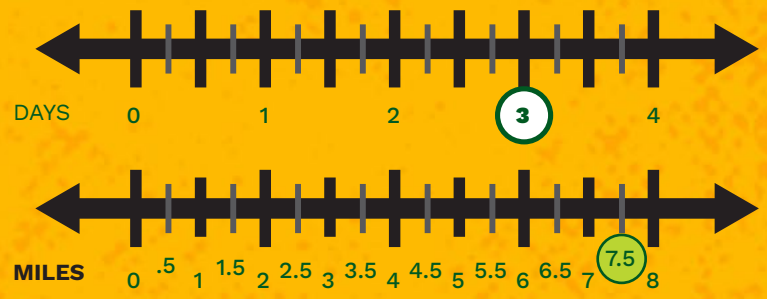
How many total miles did he walk?



DECONTEXTUALIZE

Sam walked 2.5 miles per day for 3 days.

How many total miles did he walk?



2.5 x 3 = 7.5

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

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.

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

CONSTRUCT VIABLE ARGUMENTS AND CRITIQUE THE REASONING 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.

1 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?

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

I will round to the whole page.

3 Find **important numbers.**

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

4 Use **tools** to **show relationships.**

5

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

6 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.

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

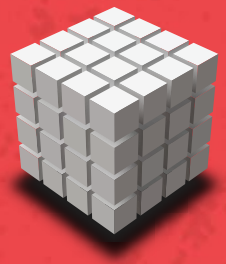
The more days Kylie reads, the fewer pages per day she has to read. That makes sense!

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

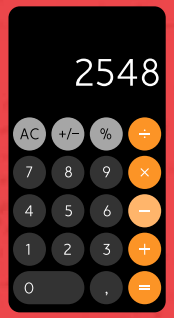
USE APPROPRIATE TOOLS STRATEGICALLY.

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

I KNOW HOW AND WHEN TO USE MATH TOOLS.

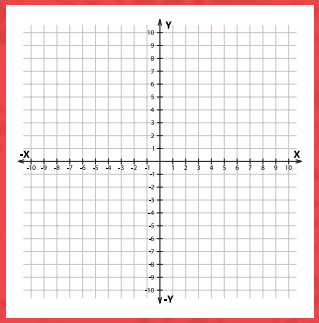


$V = b \times h$



X	Y
1	100
2	200
3	300

$a \times b = b \times a$



I CAN REASON: "DID THE TOOL I USED GIVE ME AN ANSWER THAT MAKES SENSE?"

ATTEND TO PRECISION.

MATHEMATICIANS ATTEND TO PRECISION BY USING...

- Math vocabulary with clear definitions
- Symbols that have meaning
- Context labels
- Units of measure
- Calculations that are accurate and efficient

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

HOW MUCH CHOCOLATE WILL EACH PERSON GET IF 3 PEOPLE SHARE 1/2 LB. OF CHOCOLATE EQUALLY?

SYMBOLS

1/2 LB. ÷ 3 PEOPLE = 1/6 LB. OF CHOCOLATE EACH

UNITS OF MEASURE

CONTEXT

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

LOOK FOR AND MAKE USE OF STRUCTURE.

NUMBERS. FOR EXAMPLE:

Real Number System

Rational Numbers
2, -3, 18/4, 0, 2.9...
Number that can be expressed as a ratio of two integers

Integers
0, 3, -3

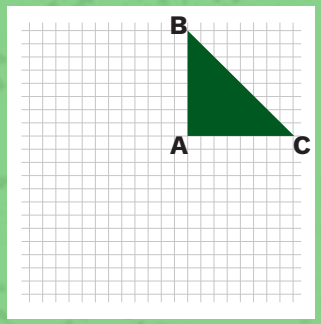
Whole numbers and their opposites

Whole Numbers
0, 1, 2, 3...

Natural Numbers
1, 2, 3...

Irrational Numbers
√2, π, 0.121121112...
Real Numbers that cannot be expressed as a ratio of two integers

SPACES. FOR EXAMPLE:

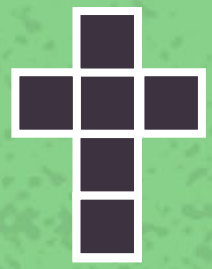


The distance from Point A to Point C is 8 units.

Location ~ Distance

$V = b \times h$

Measurement ~ Volume



Dimension ~ Nets

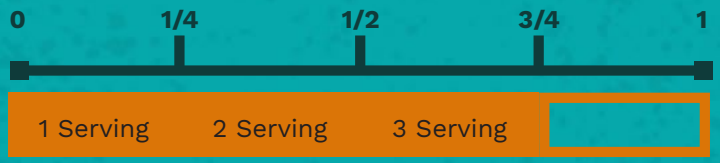
LOOK FOR AND EXPRESS REGULARITY IN REPEATED REASONING.

EXAMPLE:

I have a container of yogurt that is ¾ full. One serving of yogurt is ¼ of the container. How many servings are left in the container?

(THINK: How many ¼'s are in ¾'s?)

I can notice that ¼ is repeated and draw a model to figure out the number of servings left in the container.



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

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

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

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.