WHEN PRESENTED

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

IOWA Department of Education

Make sense of problems and persevere in solving them.

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 solution?*

EVALUATE

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

Reason abstractly and quantitatively.

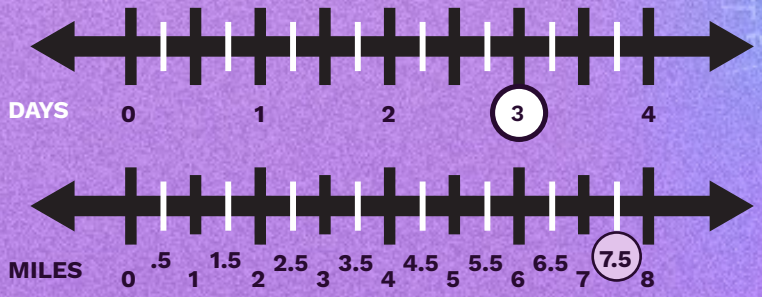
Contextualize

2.5 X 3 = 7.5

↓

Sam walked 2.5 Miles per day for 3 days.

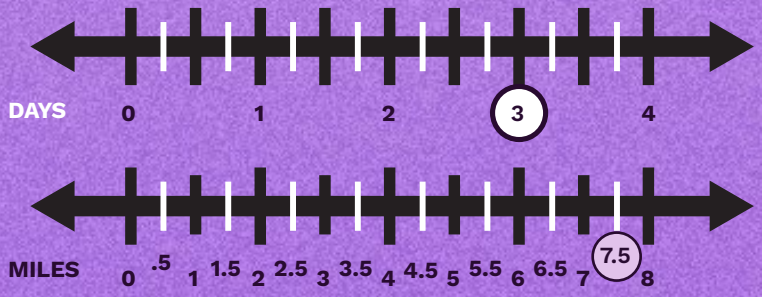
How many total miles did he walk?



Decontextualize

Sam walked 2.5 miles per day for 3 days.

How many total miles did he walk?



↓

2.5 X 3 = 7.5

When Presented

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 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

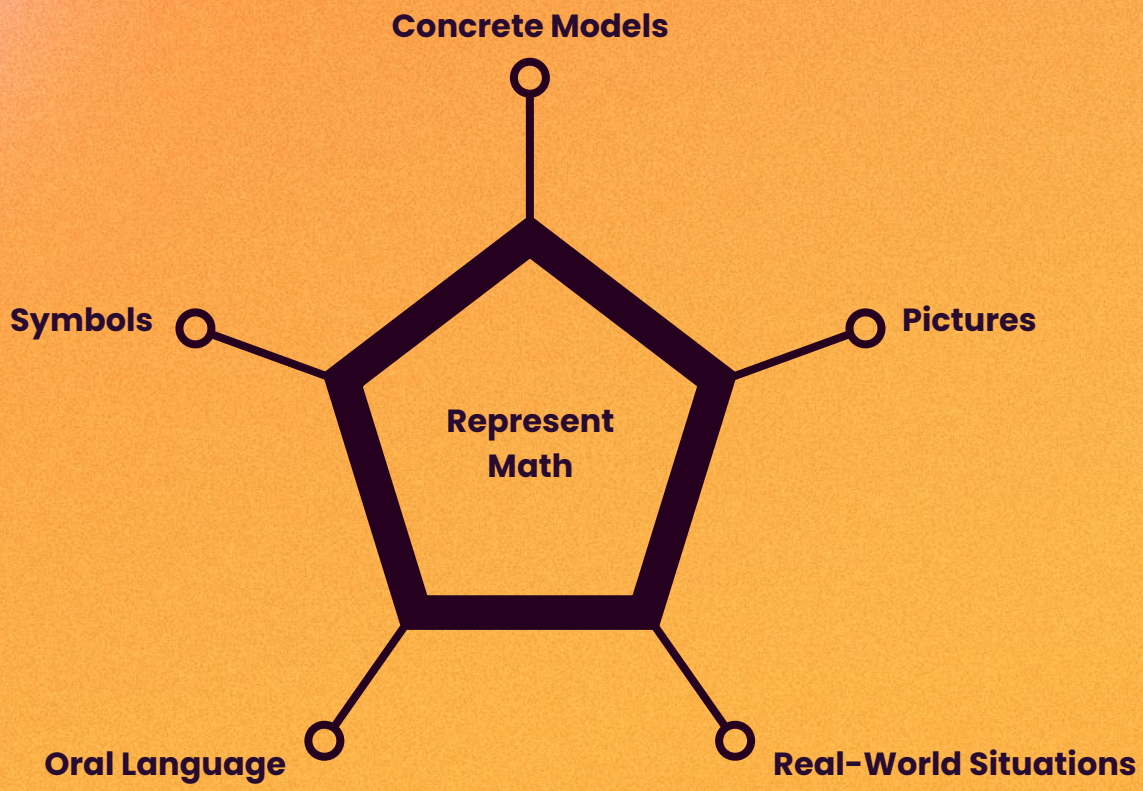
WHEN PRESENTED

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

MODEL WITH MATHEMATICS.

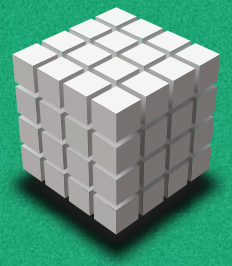
I CAN...

- 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 needeeds

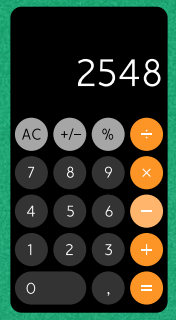


USE APPROPRIATE TOOLS STRATEGICALLY.

I KNOW HOW AND WHEN TO USE MATH TOOLS.

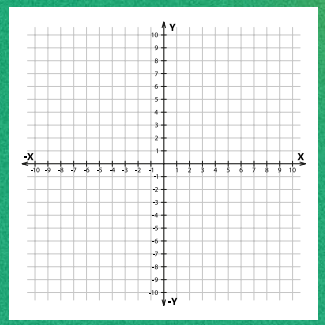


$V = b \times h$

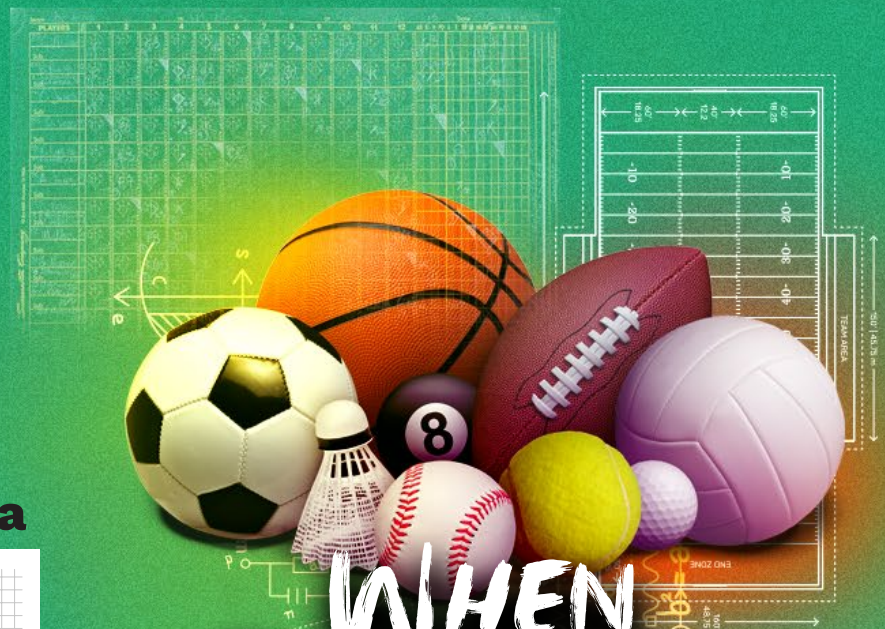


X	Y
1	100
2	200
3	300

$a \times b = b \times a$



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



WHEN PRESENTED

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

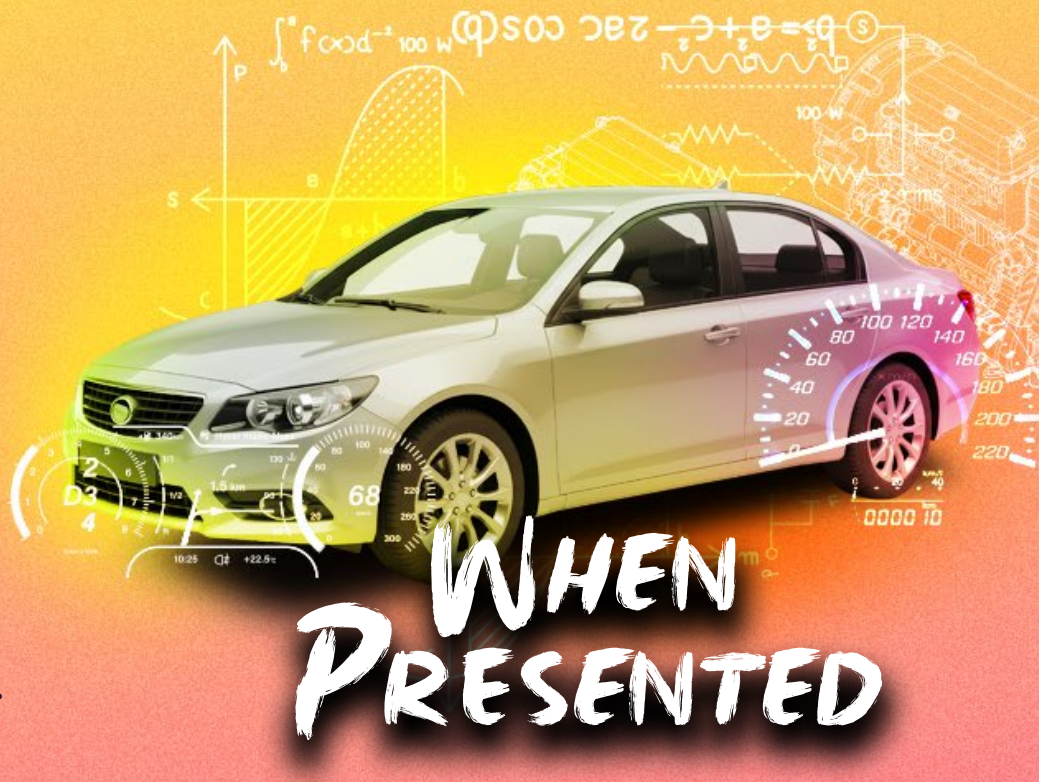
ATTEND TO PRECISION.

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



When Presented

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

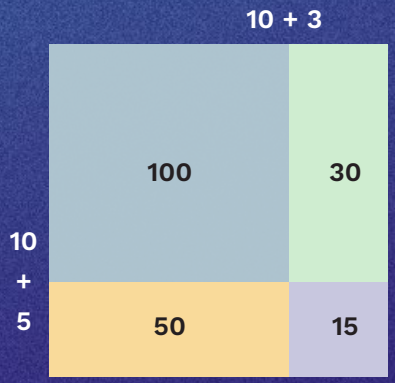
When Presented

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

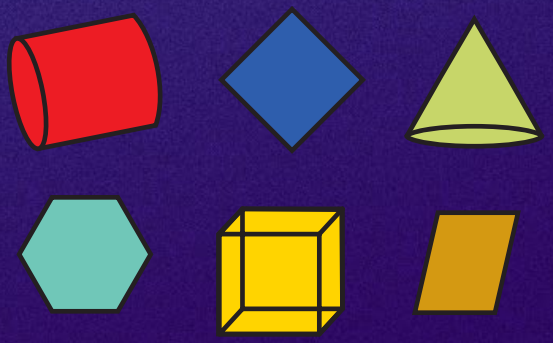
- Base 10 structure
- Operations and properties
- Terms, coefficients, exponents



13 x 15
(10 + 3) x (10+5)
100 + 30 + 50 + 15
195

Spaces. For Example

- Dimension
- Location
- Attributes
- Transformation



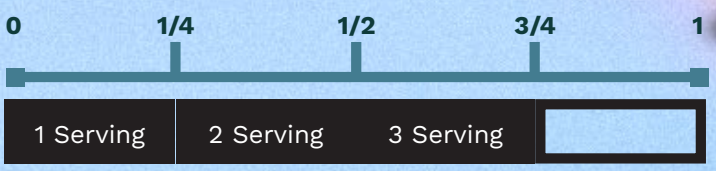
LOOK FOR AND EXPRESS REGULARITY IN REPEATED REASONING.

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.



When Presented

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.