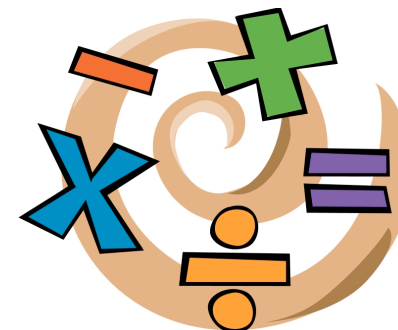


# Building Mathematical Character



## MAKE SENSE of PROBLEMS



**Picture the situation.**

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



**Look for clue words.**

**What is given?**

**What is not given?**



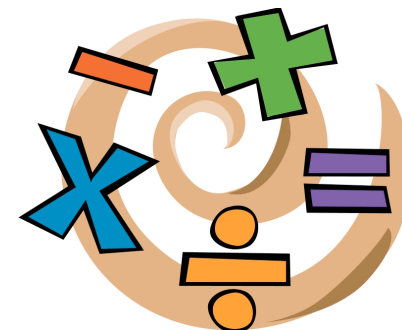
**What tools will I use?**

- number sentence
- chart, table
- number line
- manipulatives
- draw a picture

**Find a good place to start, and begin solving.**



# Building Mathematical Character



## PERSEVERE in SOLVING them



**Does my answer and/or my strategy make sense?**



**Try a new strategy if it isn't working.**

**What worked?**

**What didn't work?**

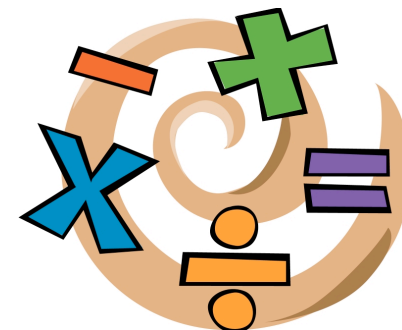


**Try a different strategy to check my work.**

**How does my solution compare to others?**

**What can I learn from this?**

# Building Mathematical Character



## REASON ABSTRACTLY and QUANTITATIVELY

with numbers & symbols out of context

with numbers & amounts in context

$$53 + \square = 75$$

Properties & Operations

$$53 - 4 = \square$$

Base Ten Number System



53 students get on the bus

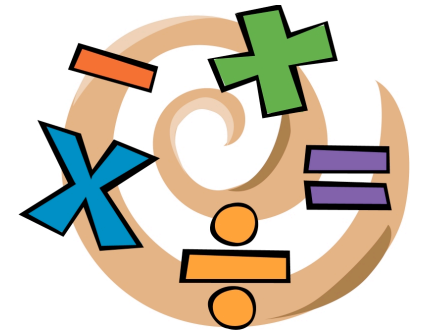
4 students get off the bus

75 seats on the bus

25 miles per hour

traveled 66 miles in 3 days

# Building Mathematical Character



## CONSTRUCT a VIABLE ARGUMENT

make  
create  
present

clear  
understandable  
accurate  
possible

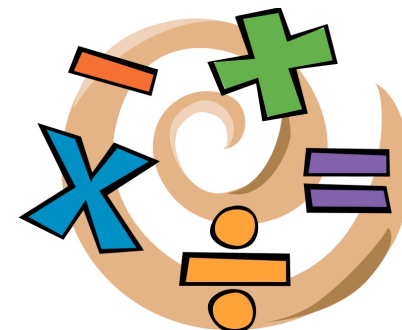
explanation  
solution  
method for  
getting the  
correct answer



**SHOW HOW** YOU GOT YOUR ANSWER,  
AND  
**EXPLAIN WHY** YOU USED THOSE NUMBERS  
AND/OR OPERATIONS...  
...IN A WAY THAT MAKES SENSE TO OTHERS.



# Building Mathematical Character



## CRITIQUE the REASONING of others

I agree with \_\_\_\_\_  
because \_\_\_\_\_

I do not understand \_\_\_\_\_  
How did you get that?  
Where is this part of the problem?

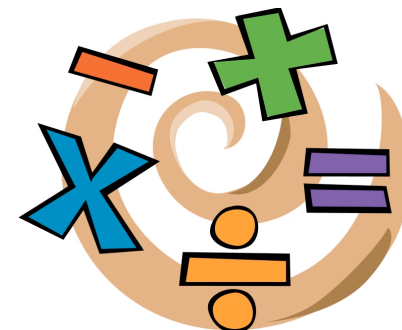
I disagree with \_\_\_\_\_  
because \_\_\_\_\_



Why is that true?  
What's the definition of \_\_\_\_\_ ?

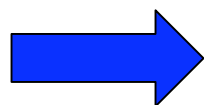


# Building Mathematical Character



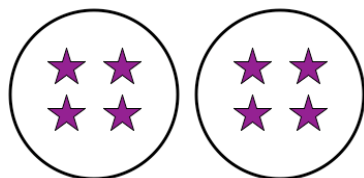
## MODEL with MATHEMATICS

Write number sentences and equations for a given problem.

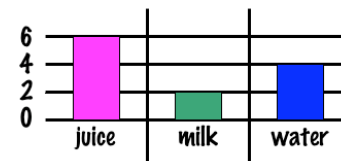
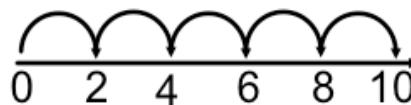


$$23 + 17 = 40$$

Create representations, tables, number lines, and graphs.

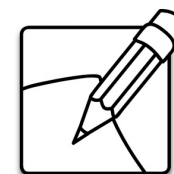


| dimes | nickels | pennies |
|-------|---------|---------|
| 2     | 1       | 0       |
| 2     | 0       | 5       |
| 1     | 3       | 0       |
| 1     | 2       | 5       |



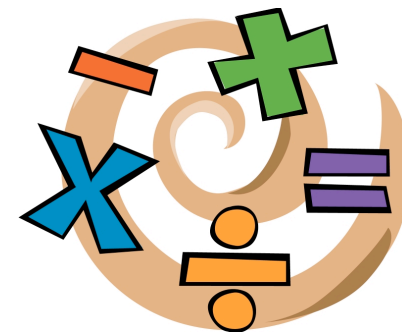
Write problems for a given number sentence or equation.

$$7 \times 6 = 42$$





# Building Mathematical Character



## USE APPROPRIATE TOOLS STRATEGICALLY

Base Ten blocks

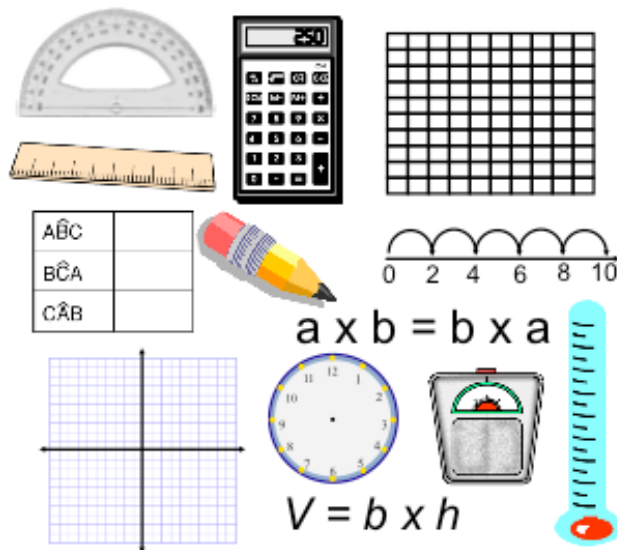
Unifix cubes

Estimation

Measuring tools

Number lines

Graph paper



|               |  |
|---------------|--|
| A $\hat{B}$ C |  |
| B $\hat{C}$ A |  |
| C $\hat{A}$ B |  |

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

$$V = b \times h$$

Drawings

Tables

Charts

Organized lists

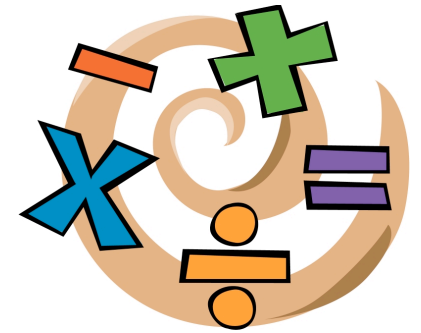
Calculator

Online search

Paper & pencil

Knowledge of numbers & properties

# Building Mathematical Character



## ATTEND to PRECISION

be precise, accurate in...

### Problem Solving



### Communicating

Calculate **ACCURATE** answers.

Find an **EFFICIENT** method for calculating my answer.

Check my work:  
Does my answer  
**MAKE SENSE?**



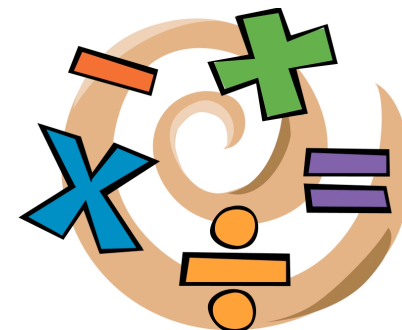
Speak, Read, Write, and Listen  
**MATHEMATICALLY.**

Correctly **USE:**

- Math **SYMBOLS**
- Math **VOCABULARY**
- **UNITS** of **MEASURE**



# Building Mathematical Character



## LOOK FOR and MAKE USE of STRUCTURE

understanding parts, wholes, and patterns in...

### Numbers

### &

### Shapes

Using Base 10 structure

Using Operations and Properties

$$56 + 23 =$$

$$56 + (2 \text{ tens} + 3) \rightarrow 56, 66, 76 + 3 = 79$$

The Distributive Property:

$$8 \times 7 =$$

$$8 \times (5 + 2) =$$

$$(8 \times 5) + (8 \times 2) =$$

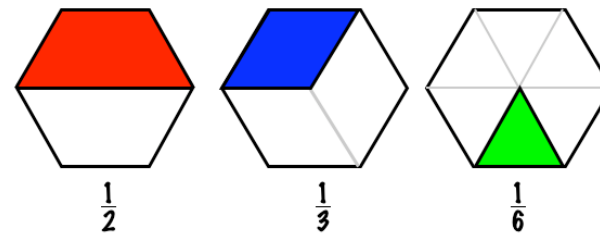
$$40 + 16 = 56$$

Sorting Shapes by Attributes

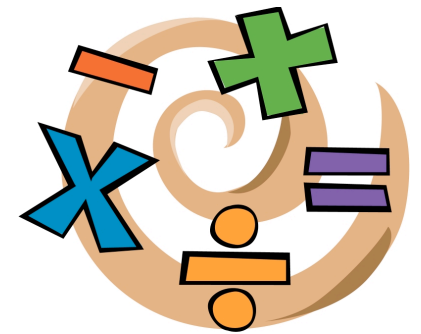
-number of sides

-number of right angles

Using dimensions to calculate area, volume



# Building Mathematical Character



## LOOK FOR and EXPRESS

## REGULARITY in REPEATED REASONING

Noticing repeated calculations and strategies  
and finding general methods and short cuts

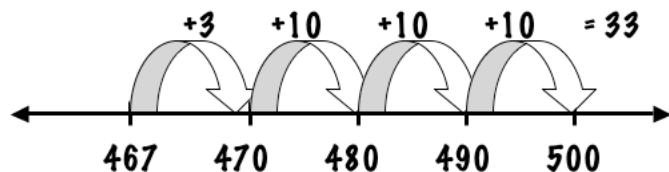
Using Doubles facts

$$5 + 8 =$$

$$5 + 5 + 3 =$$

$$10 + 3 = 13$$

$500 - 467$  is the same as  $467 + \square = 500$



$3+3+3+3+3 \rightarrow$  five 3s added together  $= 5 \times 3$   
 $5 \times 3$  has the same product as  $3 \times 5$  (Commutative Property)  
 $3 \times 5 \rightarrow 5, 10, 15 = 15$

Repeated subtraction is related to division.

Division can be thought of as a missing factor.

You have:      Each costs:      How many can you buy?  
 \$36                      \$9                       $\$36 - \$9 - \$9 - \$9 - \$9$



OR

$\square \times \$9 = \$36$