SOAR WITH THE COMMON CORE

California Common Core Standards

Session 3 of 5: Mathematics

Mathematics in the Real World

Activity:

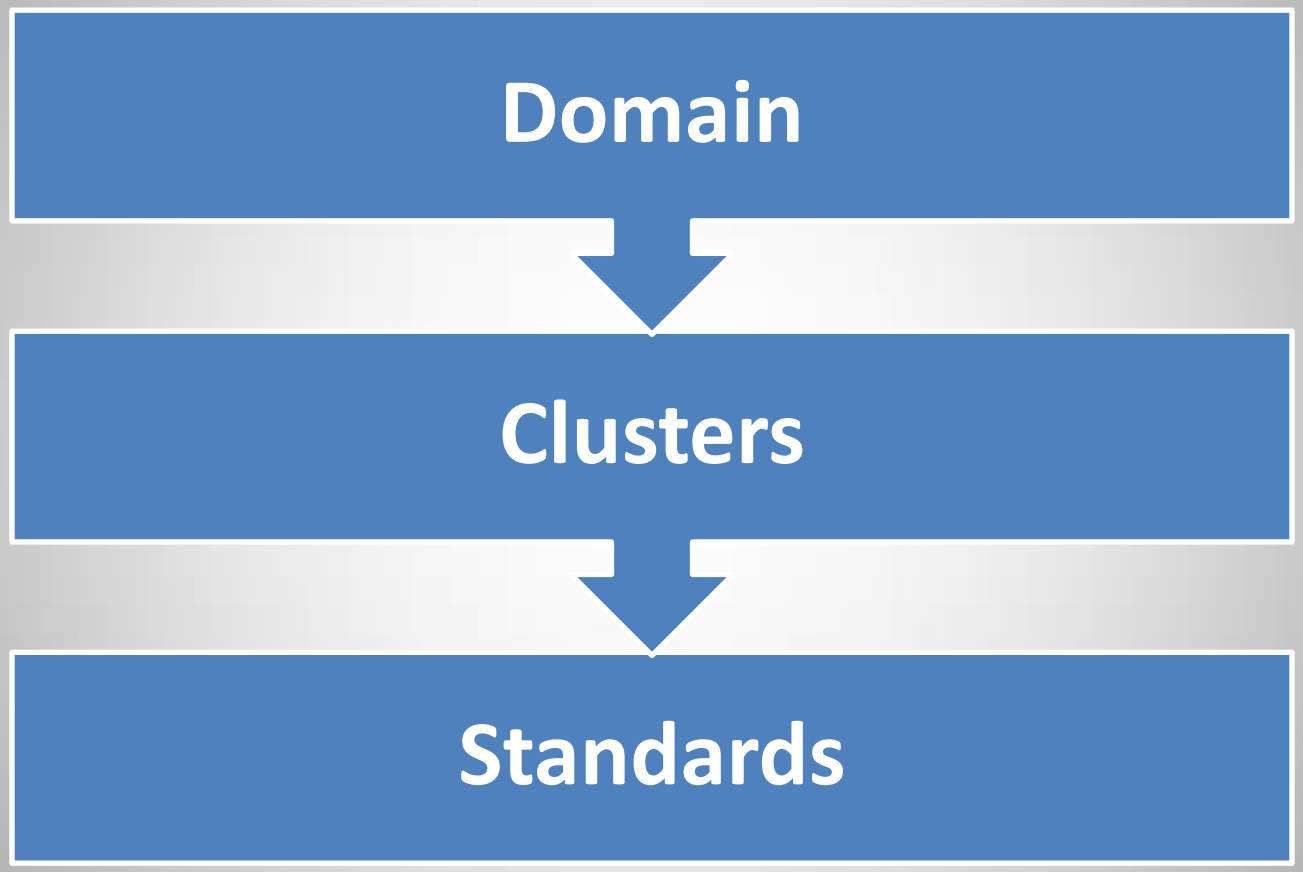
Think about the types of mathematics that you do on a daily basis. Take a couple of minutes to make a list.

What is shifting?

Your child will:

- work more **deeply** with **fewer** topics
- Keep **building** on learning **year after year**
- Spend time practicing **math facts**
- Understand **why** mathematics works and be asked to **talk** about and **prove** their understanding
- Use math in **real-world** situations

Organization of the Mathematics CCSS



Organization of the Mathematics CCSS

DOMAIN

Counting and Cardinality (Kindergarten)

Know number names and the count sequence

1. Count to 100 by ones and tens
2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1)
3. Write numbers from 0 to 20. Represent a number of objects within a written numeral 0-20 (with 0 representing a count of no objects)

CLUSTER

STANDARDS # 1, 2, 3

Organization of the Mathematics CCSS

- Two types of standards:

Eight Mathematical Practice Standards

+

Content Standards

= Habits of Mind

Mathematical Practice #1

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...

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?*

DURING...

PERSEVERE (Stick to it!)

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'?*

Mathematical Practice #2

Reason abstractly and quantitatively.

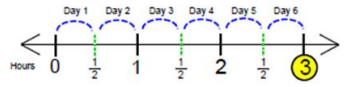
Mathematical Practice 2

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

Contextualize (Numbers to Words)

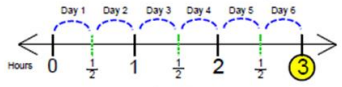
$\frac{1}{2} \times 6 = 3$ *or* $6 \times \frac{1}{2} = 3$

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?



$\frac{1}{2} \times 6 = 3$ *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.

Mathematical Practice #3

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

Mathematical Practice #4

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

→ Use **tools** to **show relationships**.

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

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

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

← Consider my **answer** – **Does it make sense?**

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

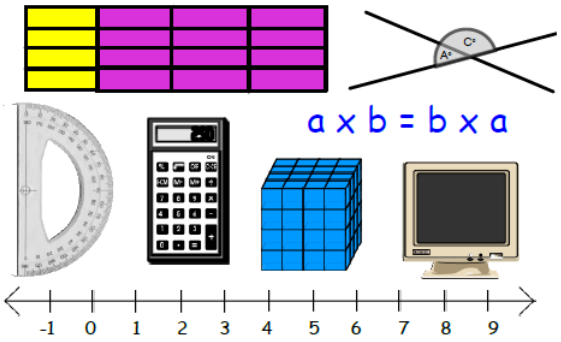
...to solve everyday problems.

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?"*



Mathematical Practice #5

Mathematical Practice #6

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 inches = 4 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.

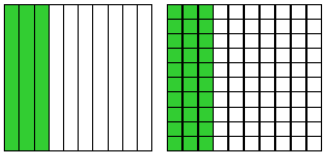
Mathematical Practice 7

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 $\frac{30}{100}$.

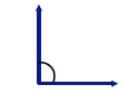


So, $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.

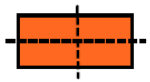
Equivalent Fractions

Spaces

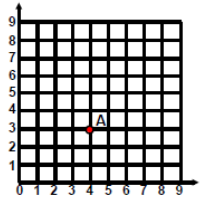
For Example:



Lines and Angles



Symmetry



Location

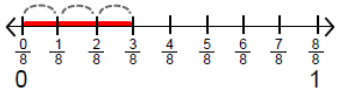
Mathematical Practice #7

Mathematical Practice #8

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...	There are many ways to decompose $\frac{3}{8}$ because it is composed of repeated $\frac{1}{8}$s. I CAN.....		
...I think about what I'm trying to figure out while I pay attention to the details	....*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) $\frac{3}{8} = \frac{1}{8}, \frac{1}{8}, \frac{1}{8}$
...I evaluate if my results are reasonable.	....*jump three* $\frac{1}{8}$ *size jumps on a number line.* 		

Let’s do some math!

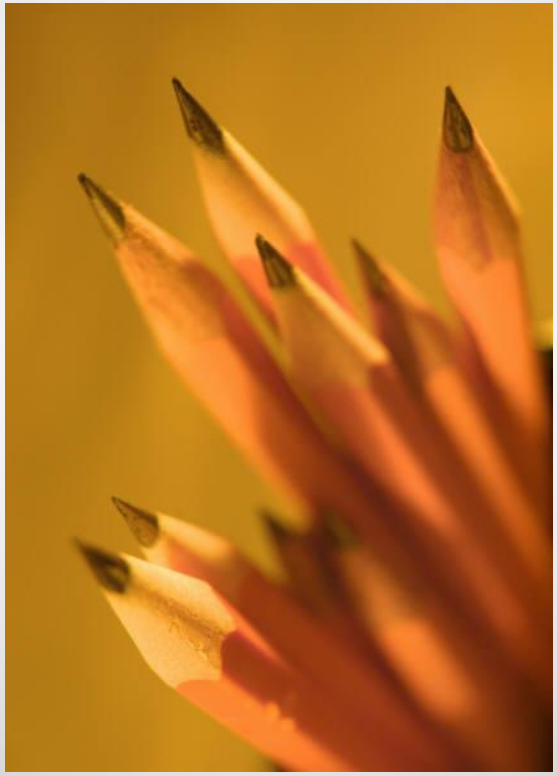
- There are 6 tables in Mrs. Potter's art classroom. There are 4 students sitting at each table. Each student has a box of 10 colored pencils.

  (A) How many colored pencils are at each table?

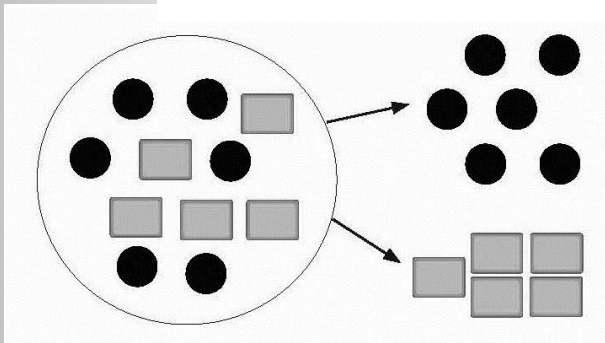
  (B) How many colored pencils do Mrs. Potter's students have in total?

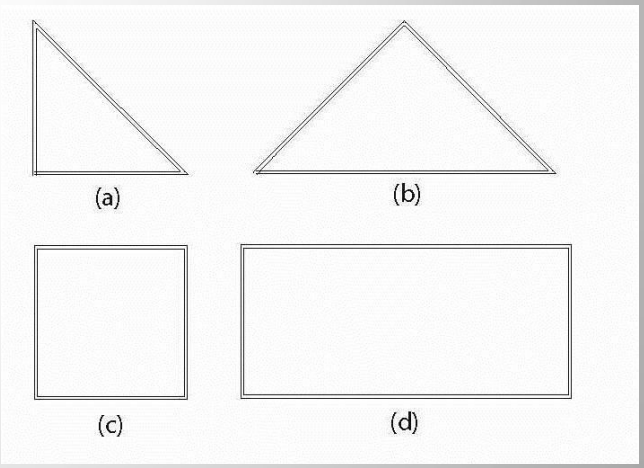
Standards and Solutions

(click on the picture)



Content Standards - Kindergarten

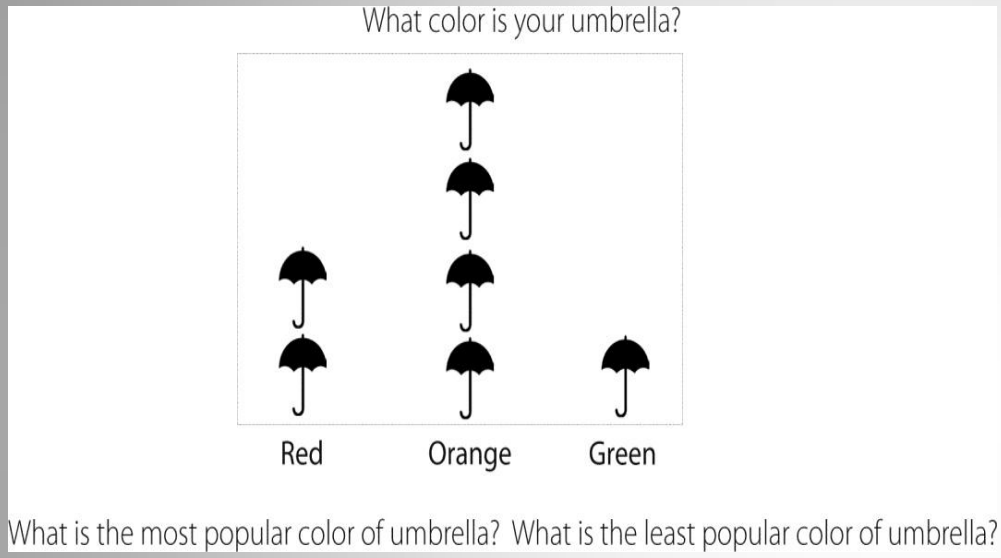


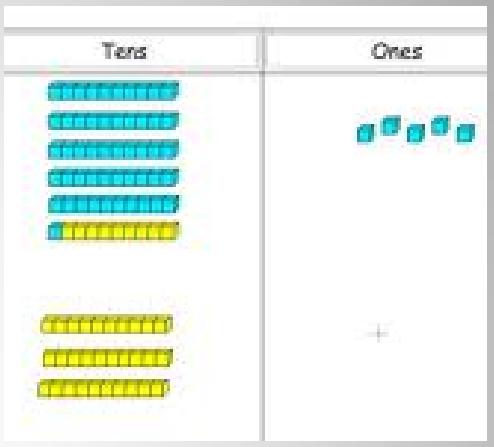


How many sides and corners do these shapes have?
Which shape has sides of equal length?

- Count to 100
- Write 0 – 20
- Add and subtract within 5
- Time

Content Standards – 1st Grade



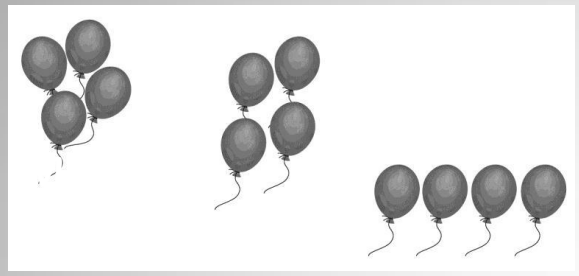


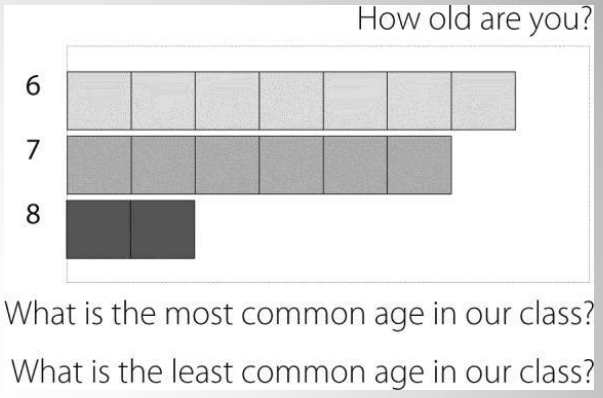
If you know 8+3=11, then you know 3+8=11

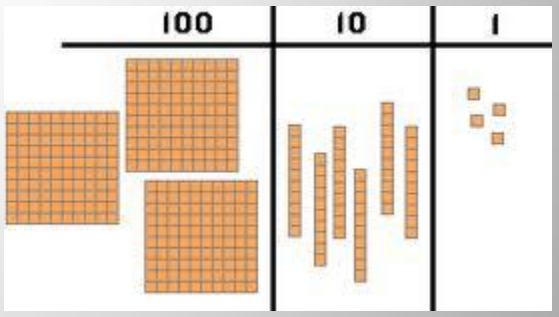
What time is it?

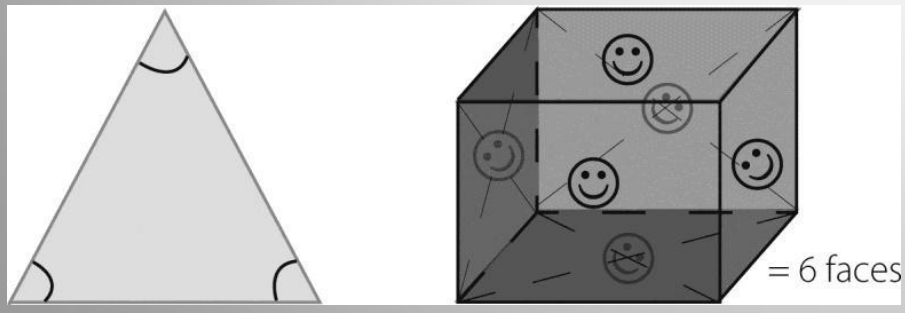
How long is the comb?

Content Standards – 2nd Grade

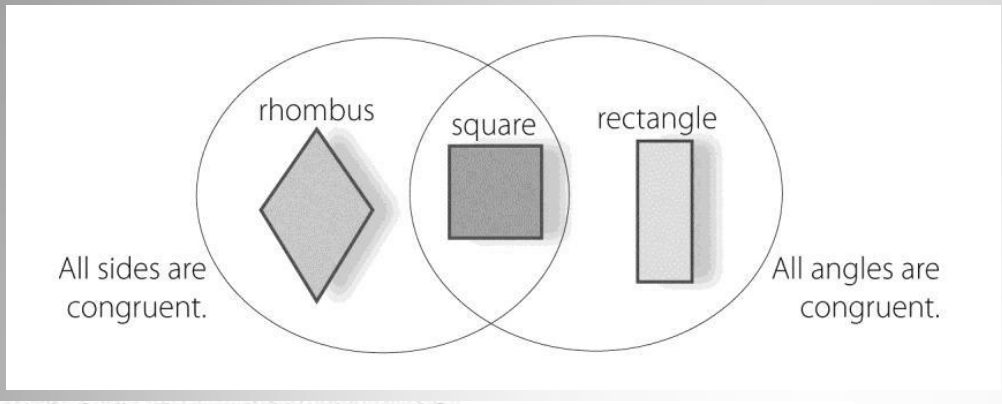








Content Standards – 3rd Grade



Distributive property of multiplication

If 8 x 5=40

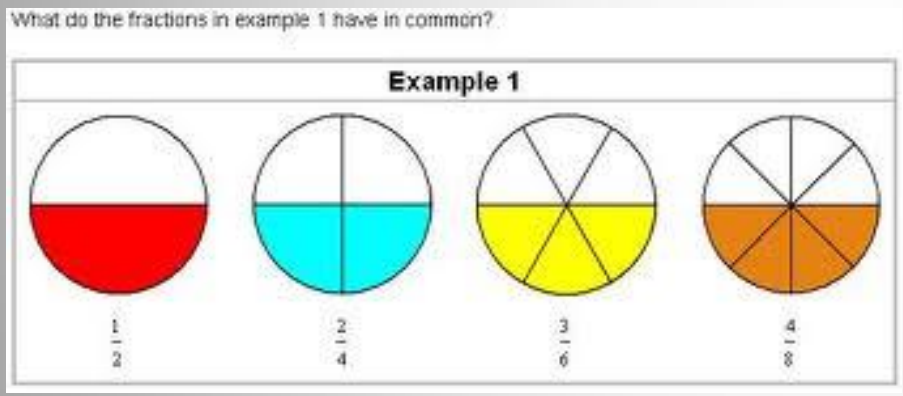
And 8 x 2=16,

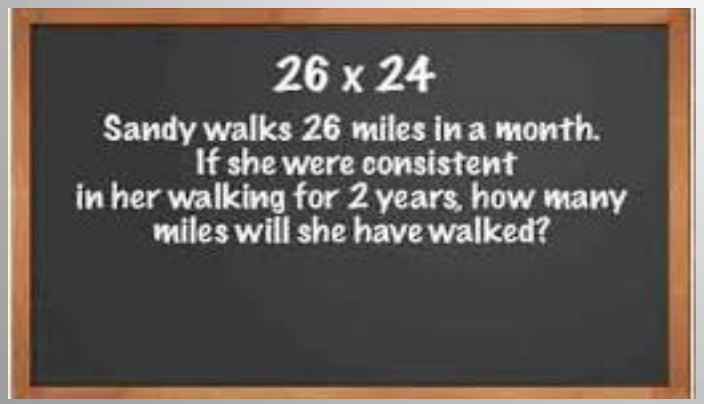
Then 8 x 7 is:

8 x (5 + 2)

(8 x 5) + (8 x 2)

40 + 16 = 56





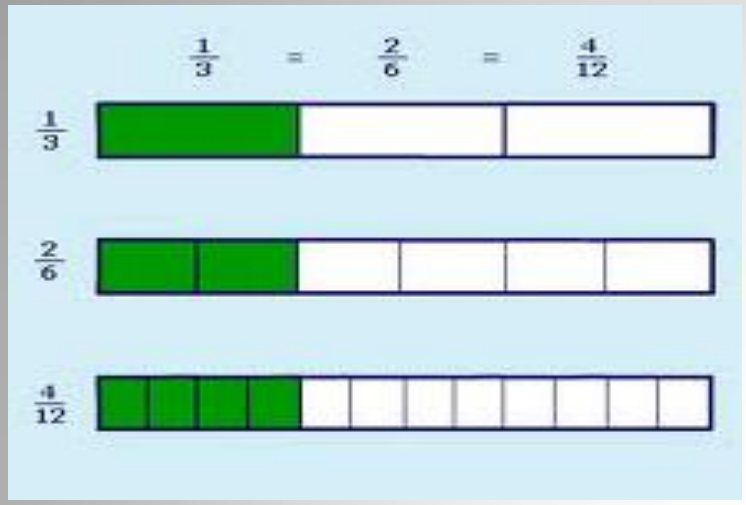
16 cookies are shared equally between 4 boys. How many cookies will each boy get?

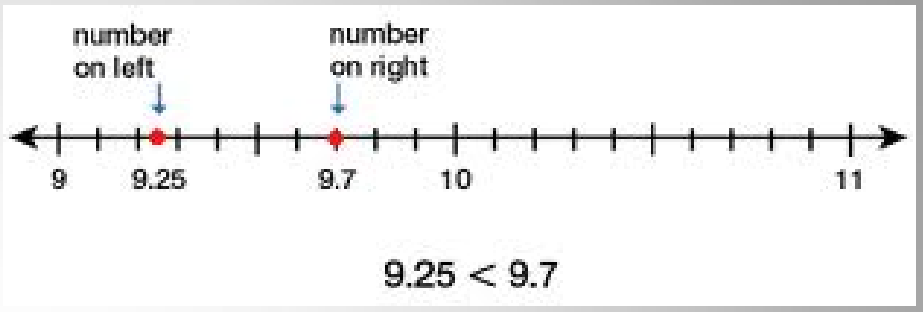
Solution

16 ÷ 4 = 4

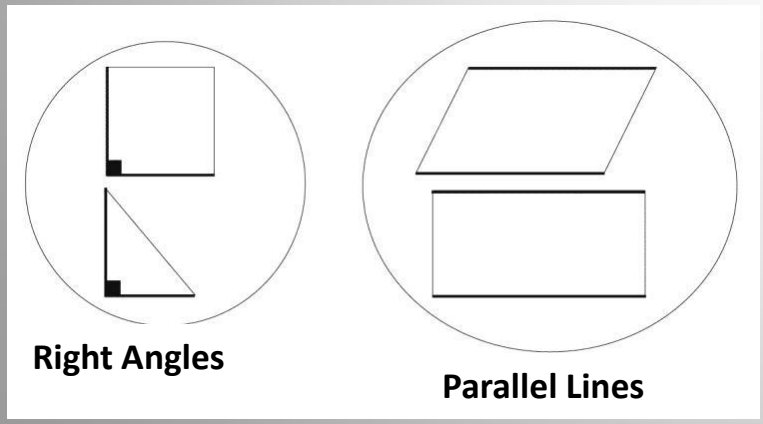
Each boy will get 4 cookies.

Content Standard – 4th Grade





Expanded form: 6738 = 6000 + 700 + 80 + 3



$\frac{53}{100} = 0.53$

54 x 12 =

28 ÷ 7 = ?

Content Standards – 5th Grade

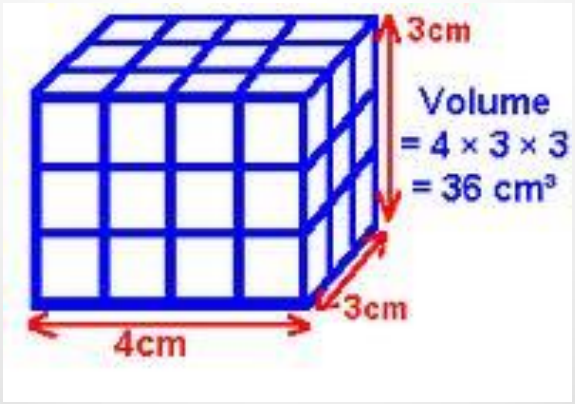
4 +6 10 +6 16 +6 22 +6 28 +6 34 +6 40 +6 46 +6 52

423.12 x8

8943.43 +17.50

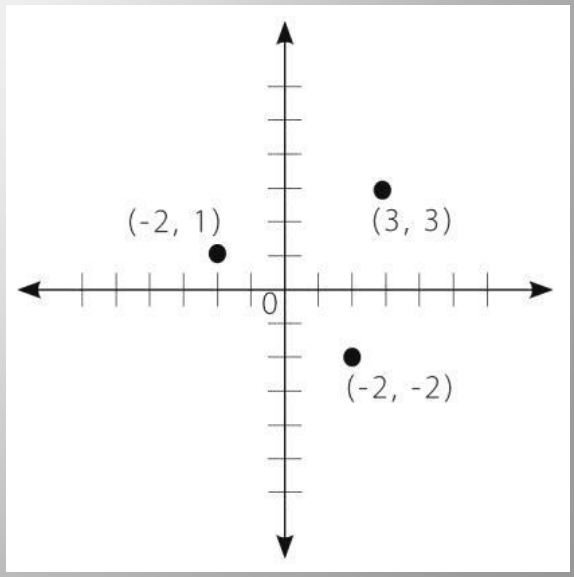
$5\overline{)25.75}$

100 - 42.11 =



$\frac{2}{3} \div 3 = \_\_$

$\frac{2}{3}$ is 3 groups of what number?

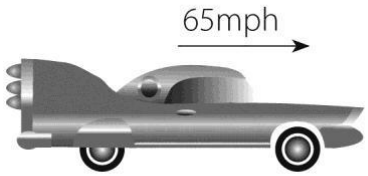


Content Standards – 6th Grade

For example, a car travels at a constant speed of 65 mph. List and graph ordered pairs of distances and times. Write the equation d = 65t to show distance travelled (d) depends on the constant speed (65) multiplied by the time travelled.

d = 65t

t=hours	distance
1	65
2	130
1/2	32.5

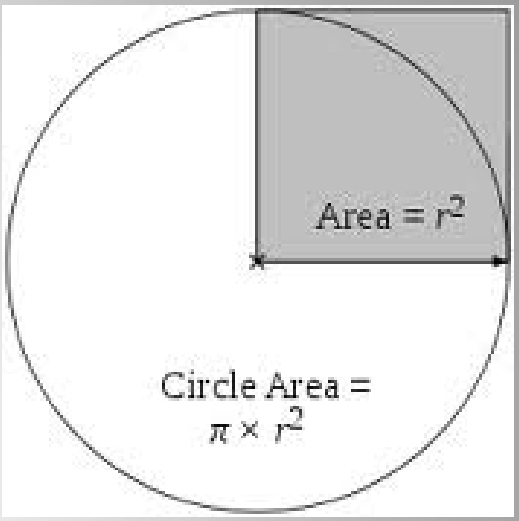


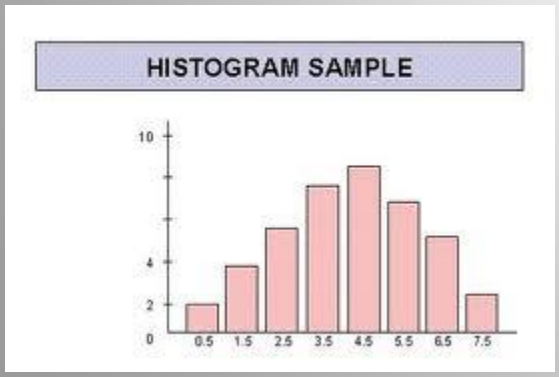
Step 1: $k \div 3 = 4$

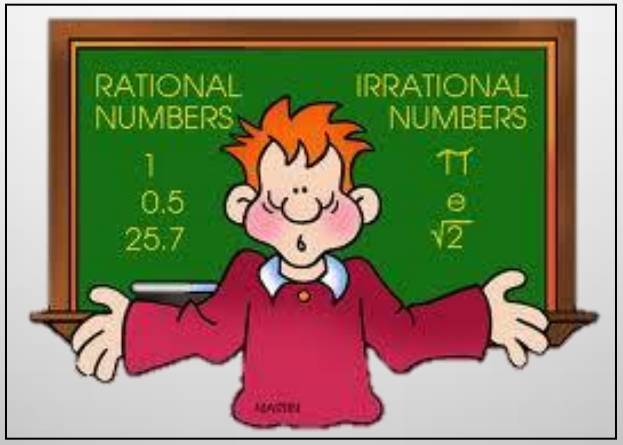
Step 2: $k \div 3 = 4$ (x3 x3)

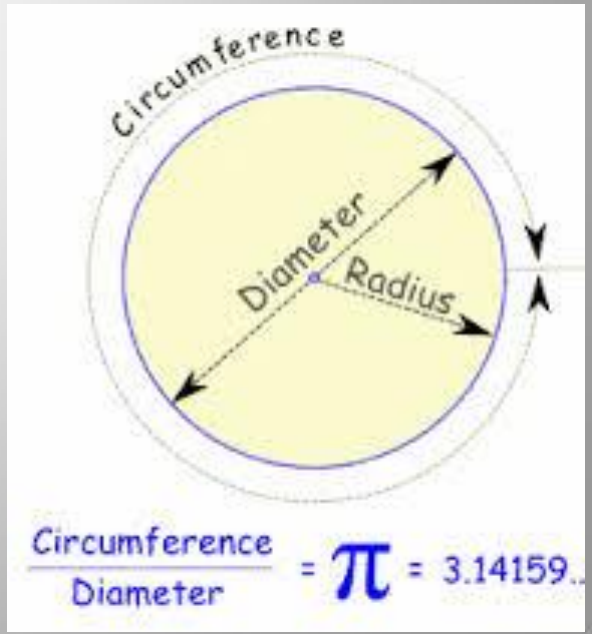
Step 3: $k = 4 \times 3$, 12

Step 4: $k = 12$







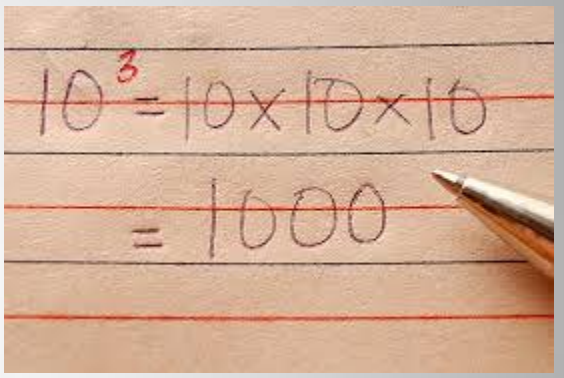


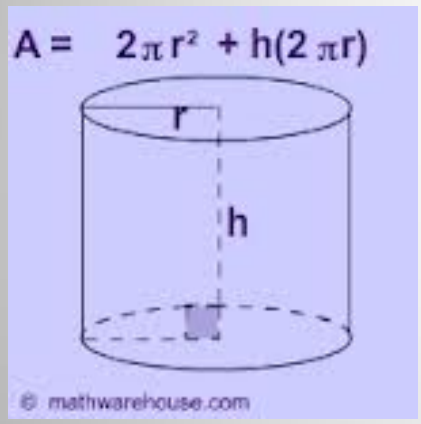
Content Standard – 7th Grade

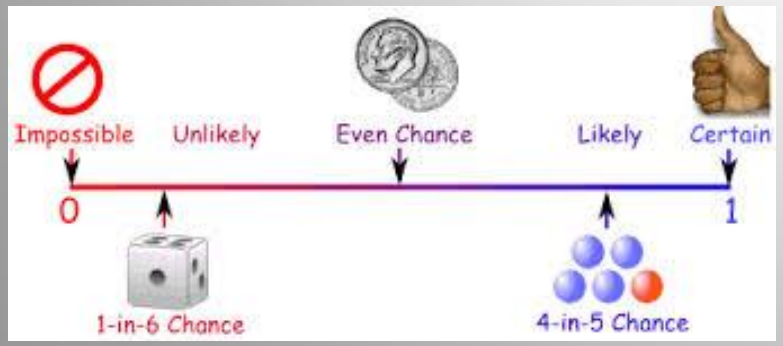
$$6 \times 6 = 6^2 = 36$$

$$\sqrt{36} = 6$$

$$\begin{aligned} 3x - 2(-2x + 7) &= -7 \\ 3x + 4x - 14 &= -7 \\ 7x - 14 &= -7 \\ 7x - 14 + 14 &= -7 + 14 \\ 7x &= 7 \\ \frac{7x}{7} &= \frac{7}{7} \\ x &= 1 \end{aligned}$$



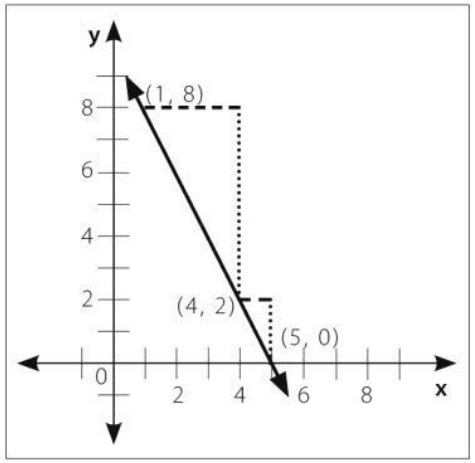




$$\sqrt[3]{8} = 2$$

Content Standards – 8th Grade

The simplified ratio of the vertical side length to the horizontal side length of each congruent triangle formed by the slope of a line is equivalent to the absolute value of the slope.



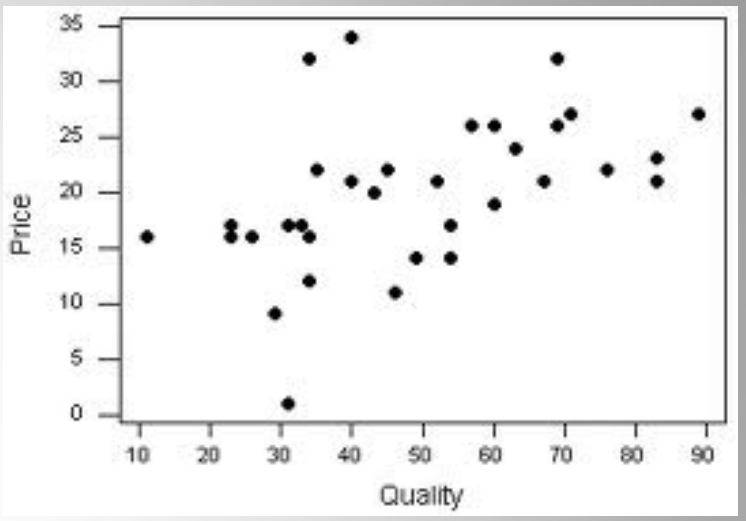
slope = $\frac{-2}{1}$, or -2

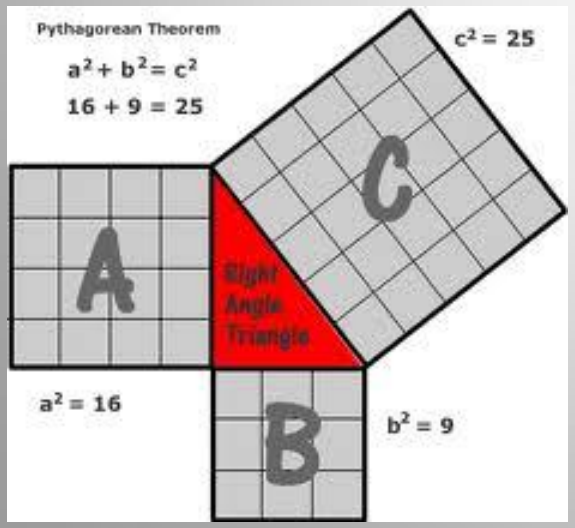
Larger Triangle:

ratio: $\frac{\text{vertical side length}}{\text{horizontal side length}} = \frac{6}{3}$, or 2

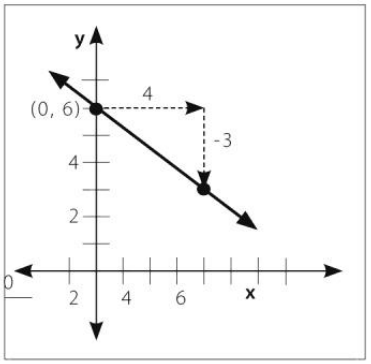
Smaller Triangle:

ratio: $\frac{\text{vertical side length}}{\text{horizontal side length}} = \frac{2}{1}$, or 2





Use only the slope and y-intercept to graph $y = \frac{-3}{4}x + 6$



The slope is $\frac{-3}{4}$ and the y-intercept is 6.

Since the y-intercept is 6, plot (0,6).

Since the slope is $\frac{-3}{4}$, move 4 units

to the right of (0, 6) and 3 units down to locate a second point.

Draw the line through the two points.

Let's do more math!

- You won first place at your school Science Fair! You have two choices for the prize:

  Option 1: You can take $20 home with you today.

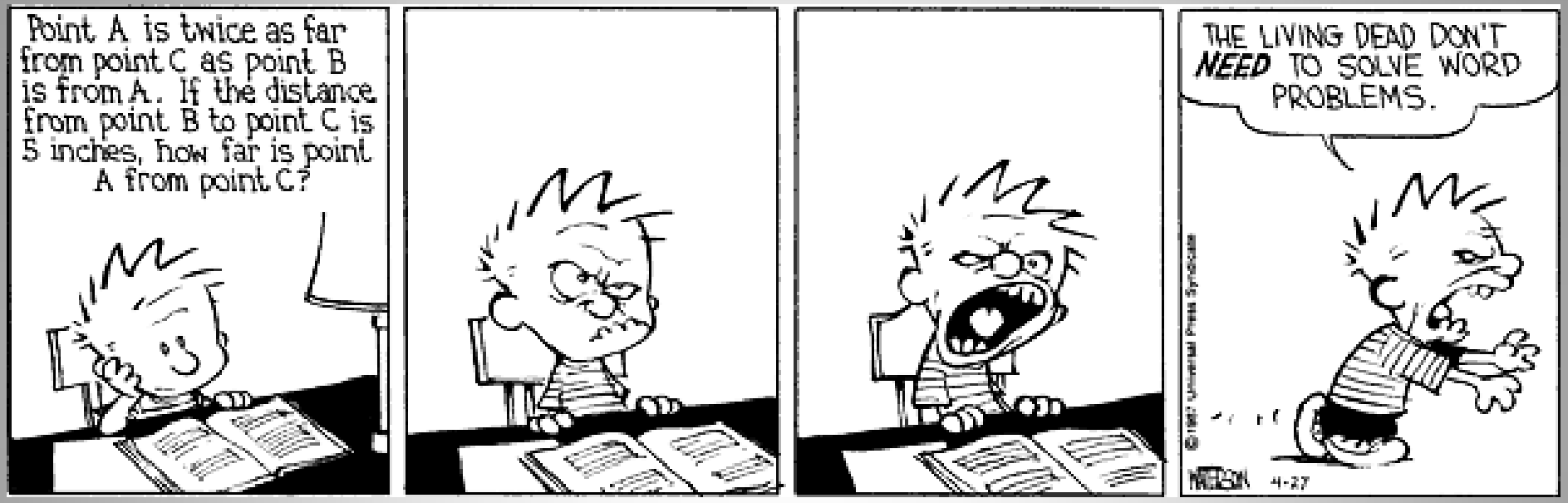
  Option 2: Take $2 a day for the next 15 days.

1. Which option earns more money? How much more?
2. Which option will you choose? Explain why.

Standards and Solutions

(click on picture)

Don’t let your child be a Calvin



How can you help?

Supporting your Child's Mathematical Learning at Home

- Stay informed about which concepts your child is learning in school.
- Help your child know basic mathematics facts.
- Have your child do the mathematics that pops up in daily life.
- Ask your child's teacher for assistance if something is confusing.
- Ensure that they are doing their homework every day.

Thank you

for

joining us today!