

4th Grade CRCT Study Guide

Numbers and Operations 43%

Place Value Whole numbers

millions		Hundred thousands	Ten thousands	thousands		hundreds	tens	ones
7	,	5	2	3	,	8	2	5

Seven million, five hundred twenty-three thousand, eight hundred twenty-five
 $7,000,000 + 500,000 + 20,000 + 3,000 + 800 + 20 + 5$
 $(7 \times 1,000,000) + (5 \times 100,000) + (2 \times 10,000) + (3 \times 1,000) + (8 \times 100) + (2 \times 10) + (5 \times 1)$

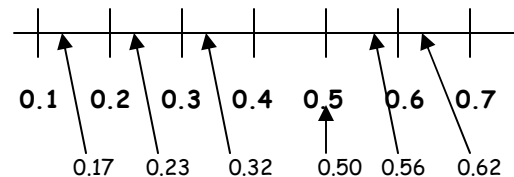
Place Value for decimal numbers

Tens	Ones	decimal	Tenths	hundredths
7	5	.	6	8

Seventy-five and sixty-eight hundredths
 $70 + 5 + 0.6 + 0.08$
 $(7 \times 10) + (5 \times 1) + (6 \times 0.1) + (8 \times 0.01)$

Putting decimals in order

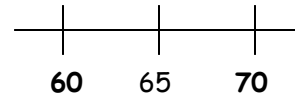
Think Money: Place the following in order from greatest to least/least to greatest.
 $\$0.56, \$0.62, \$0.17, \$0.23, \$0.32, \0.50
 Using a number line



Rounding

3,461		
Nearest 10	Nearest 100	Nearest 1,000
3,460	3,500	3,000

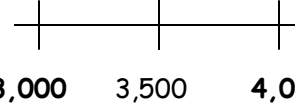
Which 10 is it closest to? 3,461



Which 100 is it closest to? 3,461

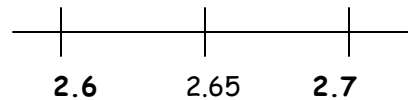


Which 1,000 is it closer to? 3,461



Round to the nearest tenth: 2.64

Which tenth is it closer to?



Answer: 2.6

Why round? Rounding is done when you need an approximate number instead of an exact amount.

Estimate the sum or difference

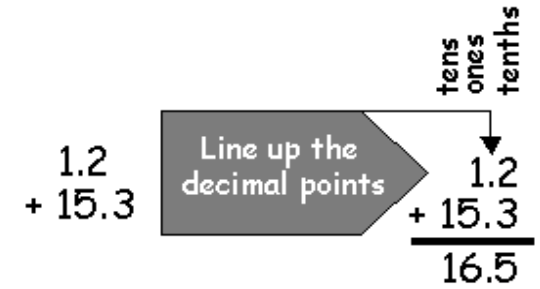
$435 + 268 =$

$618 - 385 =$

435 is about 400 and 268 is about 300, so the answer is about 100

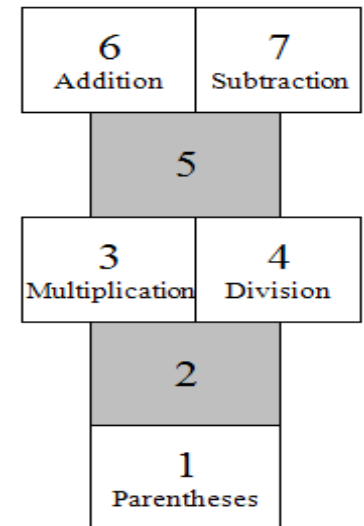
618 is about 600 and 385 is about 400, so the answer is about 200

Adding and Subtracting Decimals



Think: I need to add dollar parts to dollar parts and change parts to change parts.

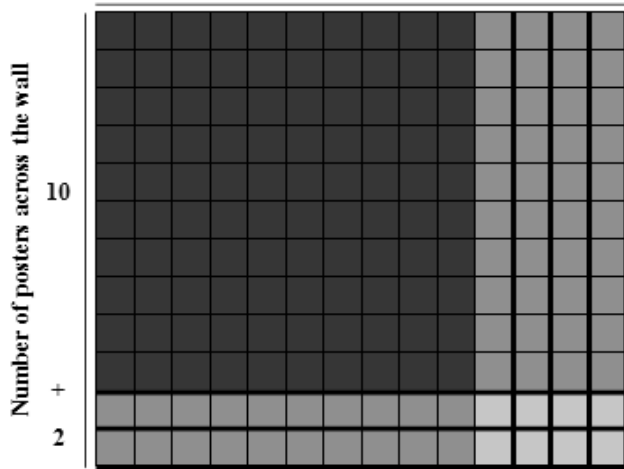
Order of Operations



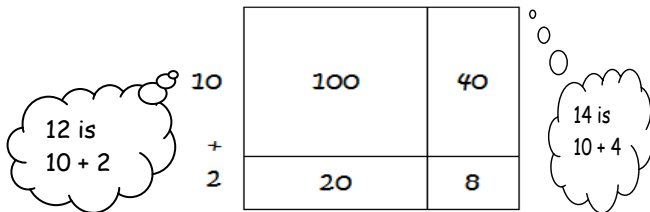
Multiplication of Whole Numbers (2 digit by 2 digit area model)

I am placing posters on my wall in my room. I can fit 14 posters across and 12 posters down my wall. How many posters can I put on my wall?

Number of posters across the wall
10 + 4



10 + 4



$$100 + 20 + 40 + 8 = 168$$

	10	4
10	100	40
2	20	8

$$\begin{array}{r} 67 \\ \times 83 \\ \hline 4800 \\ 560 \\ 180 \\ + 21 \\ \hline 5561 \end{array}$$

Division of Whole Numbers Fair Share Model

$$536 \div 4 = 134$$

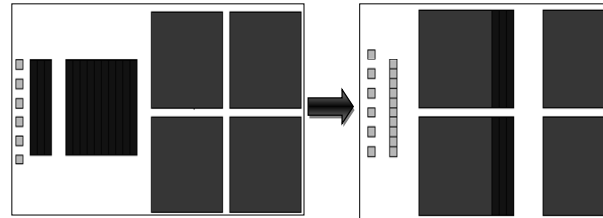


Figure 1

Figure 2

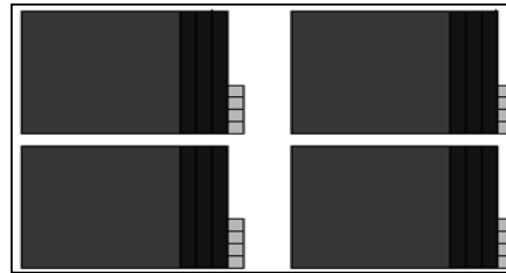


Figure 3

Division

$$\begin{array}{r} 15 \overline{)364} \\ \underline{300} \quad 20 \\ 64 \\ \underline{60} \quad 4 \\ 4 \quad 24 \text{ R}4 \end{array}$$

$$\begin{array}{r} 017 \\ 25 \overline{)425} \\ \underline{0} \downarrow \\ 42 \\ \underline{25} \downarrow \\ 175 \\ \underline{175} \\ 000 \end{array}$$

Dividend - the number being divided (364, 425)

Divisor - the number of equal groups, or the size of each group (15, 25)

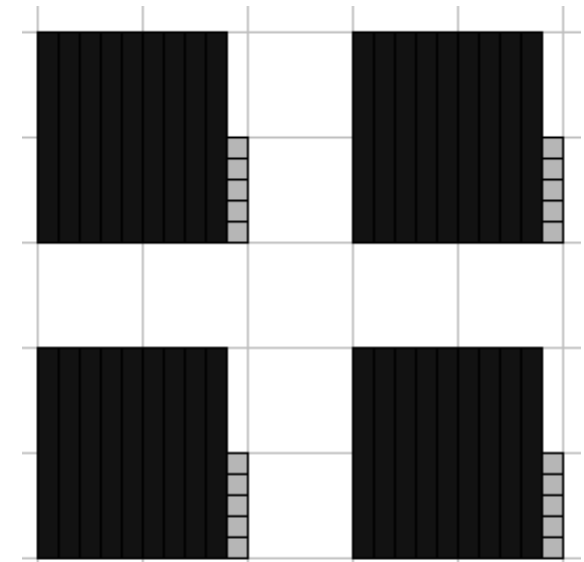
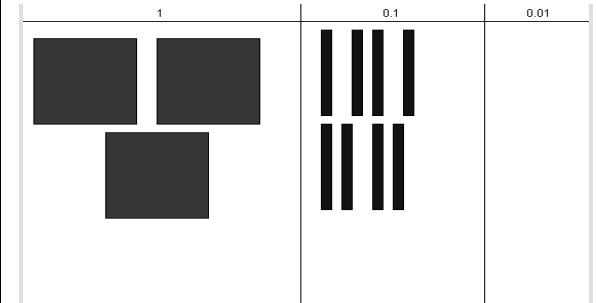
Quotient - the result of a division problem (24 R4, 17)

Example: dividend \div divisor = quotient

Remainder - the part of the dividend that is left after all possible equal sized groups are created.

Dividing Decimals Model

At the apple stand, there were 3.8 liters of cider. If four customers shared the cider equally, how much did each customer buy?



Each customer will get 0.95 liters.

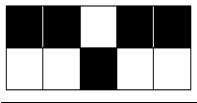
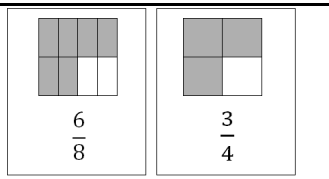
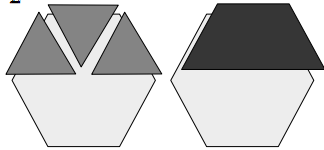
Improper Fractions and Mixed Numbers

$$1 \frac{1}{2} = 1 \frac{1}{2}$$

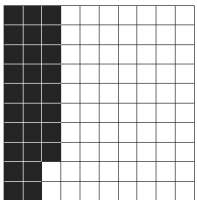
$$3 \frac{1}{2} = 1 \frac{2}{2} + 1 \frac{2}{2} + 1 \frac{2}{2} + \frac{1}{2} = \frac{7}{2}$$

Equivalent Fractions

$$\frac{3}{6} = \frac{1}{2}$$



$$\frac{5}{10} = 0.5$$



$$\frac{28}{100} = 0.28$$

Properties of Addition and Multiplication

Properties of Zero

Addition Property of Zero

- When zero is added to any number, the resulting sum is that number.
- $5 + 0 = 5$ $0 + 2 = 2$

Multiplication Property of Zero

- When zero is multiplied by any number, the resulting product is zero.
- $5 \times 0 = 0$ $0 \times 2 = 0$

Associative Properties

Associative Property of Addition

- When adding 3 or more numbers, changing the grouping does not change the sum.
- $(3 + 4) + 5 = 3 + (4 + 5)$
 $7 + 5 = 12$ $3 + 9 = 12$

Associative Property of Multiplication

- When multiplying any 3 numbers, changing the grouping does not change the product.
- $(3 \times 4) \times 5 = 3 \times (4 \times 5)$
 $12 \times 5 = 60$ $3 \times 20 = 60$

Commutative Properties

Commutative Property of Addition

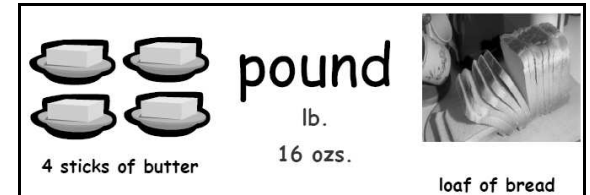
- When adding any 2 or more numbers, changing the order does not change the sum.
- $3 + 4 = 4 + 3$
 $7 = 7$

Commutative Property of Multiplication

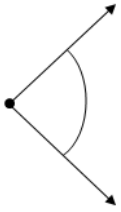
- When multiplying any 2 or more numbers, changing the order does not change the product.
- $3 \cdot 4 = 4 \cdot 3$
 $12 = 12$

Measurement 17%

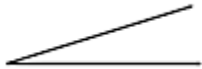
weight



Angles



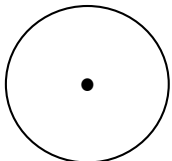
Obtuse angle: Greater than 90° and less than 180°



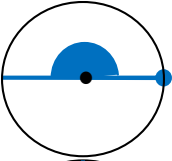
Acute Angle: Less than 90°



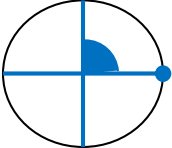
Right Angle: 90°



A full rotation of 360° is 1 whole circle



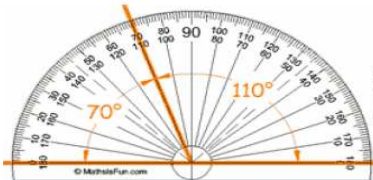
180° is a half rotation and $\frac{1}{2}$ of the circle, also called a straight angle.



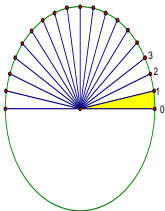
90 degrees is $\frac{1}{4}$ of the circle

Measuring Angles

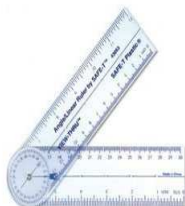
Protractor



Wedges



Angle Ruler



Geometry 20%

Triangles Classified By Sides

scalene triangle



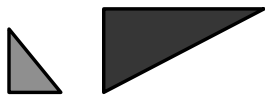
isosceles triangle



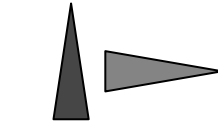
equilateral triangle



Triangles Classified By Angles



Right Triangle: has a right angle



Acute Triangle: all angles are smaller than a right angle



Obtuse Triangle: one angle is larger than a right angle

quadrilateral

A polygon with 4 sides.

rhombus

Cube

Face: a cube has 6 faces. Each is the shape of a square.

Edge: a cube has 12 edges

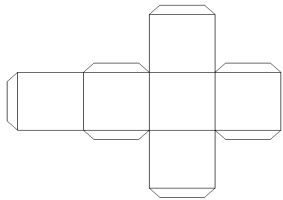
Vertex: A cube has 8 vertices

parallel

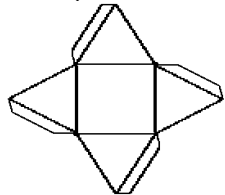
perpendicular

Solid Geometric Figure Nets

Cube



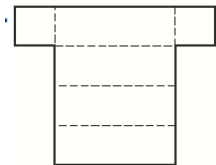
Pyramid



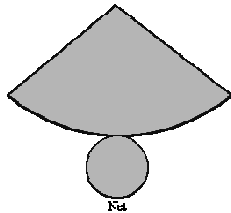
Triangular Prism



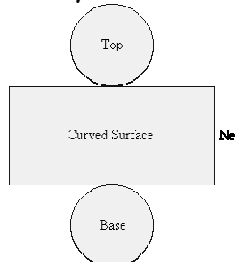
Rectangular Prism



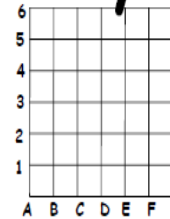
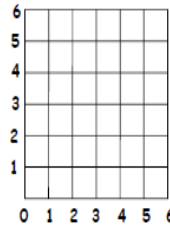
Cone



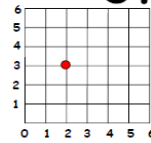
Cylinder



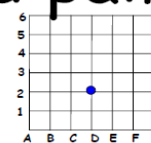
coordinate system



ordered pair



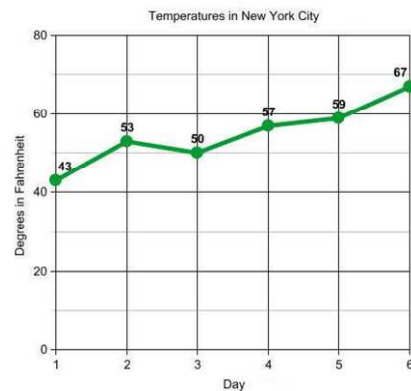
(2, 3)
→ ↑



(D, 2)
→ ↑

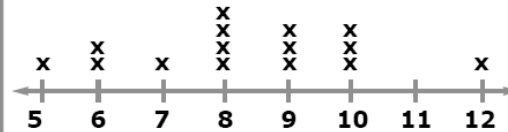
Data 10%

Line Graph



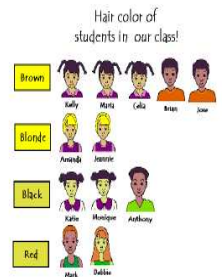
Line Plot Graph

Distance that Bullfrogs Jumped (inches)

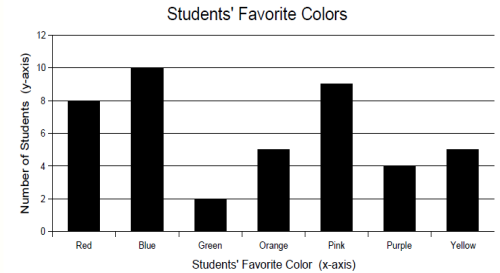


x = 1 bullfrog

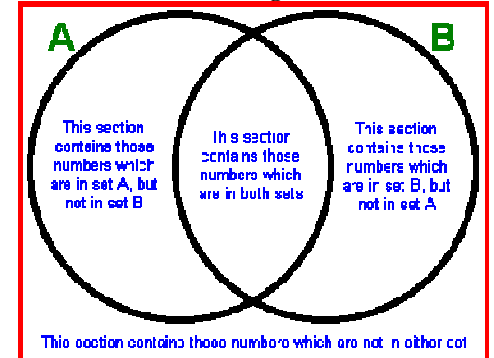
pictograph



Bar Graph



Venn Diagrams



Range, Median, and Mode

Data Set:

13, 13, 13, 13, 14, 14, 16, 18, 21

Range: The difference between the highest value and the lowest value
Range $21 - 13 = 8$

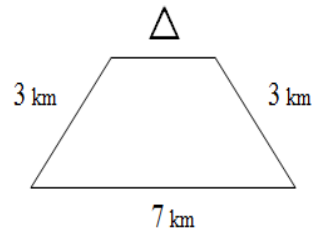
Median: The middle value.
13, 13, 13, 13, 14, 14, 16, 18, 21
Median = 14

Mode: The number that is repeated the most. *If each number is represented only one time, then there is no mode.*
13, 13, 13, 13, 14, 14, 16, 18, 21

Mode = 13

Algebra 10%

Finding Unknowns



If the perimeter is 15, what is the value of Δ ?

$$3\text{km} + 7\text{km} + 3\text{km} + \Delta = 15$$

$$\Delta = 2\text{km}$$

Patterns in numbers

My Rule

Rule: $\square + 18$

Input	Output
5	23
?	32
15	?

What's My Rule?

Rule:

Input	Output
25	5
30	6
5	1

Rule is $\square \div 5$

Writing and Evaluating Mathematical Equations

Students at Pine Elementary School typically earn 6 points for their explanation and 10 points for making a connection when completing their Exemplars. Which class scored the most points?

In the chart below:

\square represents the number of students who earned points for their explanations.

Δ represents the number of students who earned points for making connections.

Classroom	Number of students writing explanations	Number of students making connections	Expression	Substitution
Smith	3	2	$6x\square + 10x\Delta$	$6x3 + 10x2$
Jones	5	1		

Additional Resources:

- http://www.helpingwithmath.com/by_subject/decimals/dec_adding_subtracting.htm
- <http://www.ucc.edu/nr/rdonlyres/777c004d-0f6f-46ad-8a4f-c1ab2d634e15/0/propertiesofadditionandmultiplication.pdf>
- <http://etc.usf.edu/clipart/sitemap/shapes.php>
- <http://gwydir.demon.co.uk/jo/solid/cube.htm>
- <http://www.eduplace.com/parents/hmcam/reviews/pdf/4/4hmmca-cr-28-02-rt.pdf>
- http://www.mathsteacher.com.au/year8/ch10_geomcons/09_cones/cylinder.htm
- <http://www.mathgoodies.com/lessons/graphs/line.html>
- http://www.forsyth.k12.ga.us/130920629175452780/lib/130920629175452780/4_Reading_Line_Plots.pdf