

# Incorporating Mathematics into ESOL Instruction

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Webinar



**Activity Book**

Institute for the Professional Development of Adult Educators

WEBINAR ACTIVITY BOOK

# Incorporating Mathematics into ESOL Instruction

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# Agenda

- I. Why Mathematics?
- II. The Math You Already Do
- III. Blending Math with Language Instruction
- IV. Using Math to Promote Critical Thinking
- V. IPDAE Resources



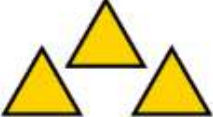
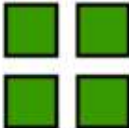

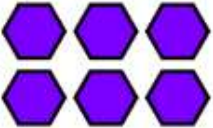

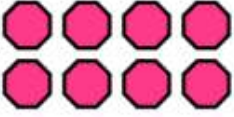

## Guiding Questions

Slide(s)	Guiding Questions	My Thoughts
8	What are the 3 components of the Florida Adult ESOL Curriculum Frameworks?	
11	Why do we teach students how to count, read and write numbers at the literacy and foundations level?	
16-17	What CASAS Reading Task Area do we address when teaching how to write a check?	
25	List all the math you can teach using a medicine label.	
28	What is the text structure of the article on Boa Constrictors?	
29	When teaching a lesson using this complex informational text, how would you unravel the mathematics competencies? What mathematics competencies would you unravel?	

# Mathematics Competencies

8	MATHEMATICS
8.1	Count to 100 by ones and by tens
8.2	Identify and classify numeric symbols
8.3	Count and associate numbers with quantities, including recognizing correct number sequencing
8.4	Measure area and volume of geometric shapes
8.5	Use or interpret measurement instruments, such as rulers, scales, gauges, and dials
8.6	Interpret diagrams, illustrations, and scale drawings
8.7	Compare objects with a measurable attribute in common, using "more of"/"less of"

## Numbers and Counting

<p><b>1</b> <b>one</b></p> 	<p><b>2</b> <b>two</b></p> 	<p><b>3</b> <b>three</b></p> 
<p><b>4</b> <b>four</b></p> 	<p><b>5</b> <b>five</b></p> 	<p><b>6</b> <b>six</b></p> 
<p><b>7</b> <b>seven</b></p> 	<p><b>8</b> <b>eight</b></p> 	<p><b>9</b> <b>nine</b></p> 

## Types of Numbers

### Cardinal Numbers



1	One	11	Eleven	21	Twenty One
2	Two	12	Twelve	22	Twenty two
3	Three	13	Thirteen	23	Twenty three
4	Four	14	Fourteen	30	Thirty
5	Five	15	Fifteen	40	Forty
6	Six	16	Sixteen	50	Fifty
7	Seven	17	Seventeen	60	Sixty
8	Eight	18	Eighteen	70	Seventy
9	Nine	19	Nineteen	80	eighty
10	Ten	20	twenty	90	ninety
				100	One hundred

### Ordinal Numbers

- dates
- rankings
- floor
- order of things

1st	<u>first</u>
2nd	<u>second</u>
3rd	<u>third</u>
4th	<u>fourth</u>
5th	<u>fifth</u>
6th	<u>sixth</u>
7th	<u>seventh</u>
8th	<u>eighth</u>
9th	<u>ninth</u>
10th	<u>tenth</u>

## Date and Time Formats

Month-Day-Year
March the Fourteenth, 2016
March 14, 2016
March 14th, 2016
3/14/2016 or 3-14-2016
3/14/16 or 3-14-16
03/14/16 or 03-14-16

Days of the Month	
1 <sup>st</sup>	First
2 <sup>nd</sup>	Second
3 <sup>rd</sup>	Third
4 <sup>th</sup>	Fourth
5 <sup>th</sup>	Fifth
6 <sup>th</sup>	Sixth
7 <sup>th</sup>	Seventh

Months		
Number	Name	Abbreviation
1	January	Jan
2	February	Feb
3	March	Mar
4	April	Apr
5	May	May
6	June	Jun
7	July	Jul
8	August	Aug
9	September	Sep
10	October	Oct
11	November	Nov
12	December	Dec

Five past six



6.05 AM  
06:05

Two o'clock



2.00 PM  
14:00

Half past eleven



11.30 AM  
11:30

Quarter to eight



7.45 PM  
19:45



## CASAS Reading Task Areas

1. Forms;
2. Charts, maps, consumer billings, matrices, graphs, or tables;
3. Stories, articles, paragraphs, sentences, directions, or pictures;
4. Signs, price tags, ads, or product labels;
5. Measurement scales and diagrams

## Steps on Writing Checks

**Jane Doe**  
123 Main St  
Anywhere US 10111

Date 07/01/2018 790  
1-678/1239

PAY TO THE ORDER OF ACME Grocery Shop \$ 8.15

EIGHT AND 15/100 DOLLARS

Your Bank  
456 Main St  
Anywhere US 10111

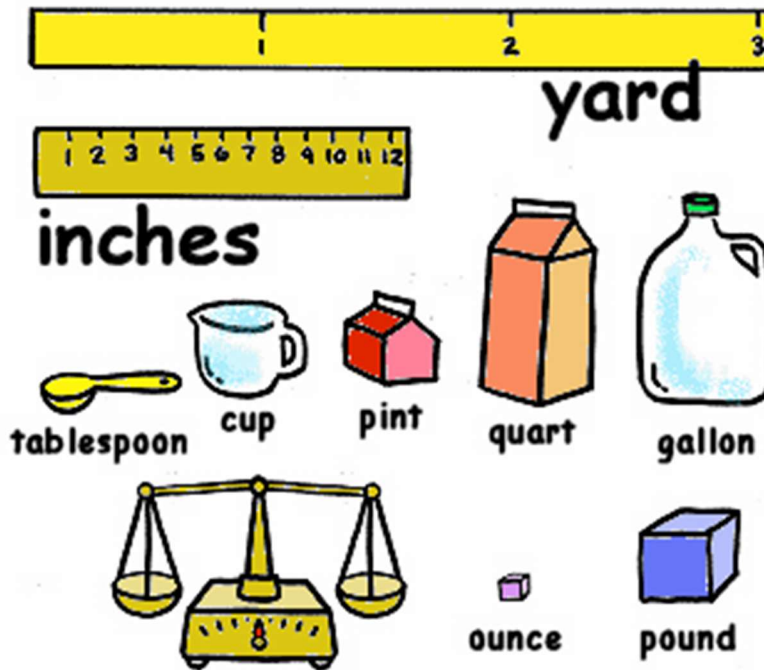
MEMO Lunch w/Friends Jane Doe

① ② ③ ④ ⑤ ⑥

①: Date  
②: Payee name  
③: Amount in dollars and cents  
④: Amount in words  
⑤: Signature  
⑥: Memo

⑆ 23456789 ⑆ 1001001239 ⑆ 0790

## Measurement Vocabulary



## Measurement Conversions



# Measurement

## Conversion Table

### Conversion Rule

Use the equivalent measures and multiply or divide.

#### Examples

To change inches to centimeters:

$$12 \times 2.54 = 30.48 \text{ cm}$$

number of inches      number of centimeters in one inch

To change centimeters to inches:

$$51 \div 2.54 = 20.08 \text{ in}$$

number of centimeters      number of centimeters in one inch

### Capacity



$$1 \text{ fl oz} = 29.574 \text{ ml} \quad 1 \text{ ml} = .034 \text{ fl oz}$$

$$1 \text{ pt} = .473 \text{ L} \quad 1 \text{ L} = 2.113 \text{ pt}$$

$$1 \text{ qt} = .946 \text{ L} \quad 1 \text{ L} = 1.057 \text{ qt}$$

$$1 \text{ gal} = 3.785 \text{ L} \quad 1 \text{ L} = .264 \text{ gal}$$

### Length and Distance

$$1 \text{ in} = 2.54 \text{ cm} \quad 1 \text{ mm} = .039 \text{ in}$$

$$1 \text{ ft} = 30.48 \text{ cm} \quad 1 \text{ cm} = .394 \text{ in}$$

$$1 \text{ yd} = .914 \text{ m} \quad 1 \text{ m} = 1.094 \text{ yd}$$

$$1 \text{ mi} = 1.609 \text{ km} \quad 1 \text{ km} = .621 \text{ mi}$$

#### U.S. Customary

#### Metric

*in* = inch

*mm* = millimeter

*ft* = foot

*cm* = centimeter

*yd* = yard

*m* = meter

*mi* = mile

*km* = kilometer

*fl oz* = fluid ounce

*ml* = milliliter

*pt* = pint

*L* = liter

*qt* = quart

*g* = gram

*gal* = gallon

*kg* = kilogram

*oz* = ounce

*lb* = pound

#### Abbreviations

### Weight

$$1 \text{ oz} = 28.350 \text{ g} \quad 1 \text{ g} = .035 \text{ oz}$$

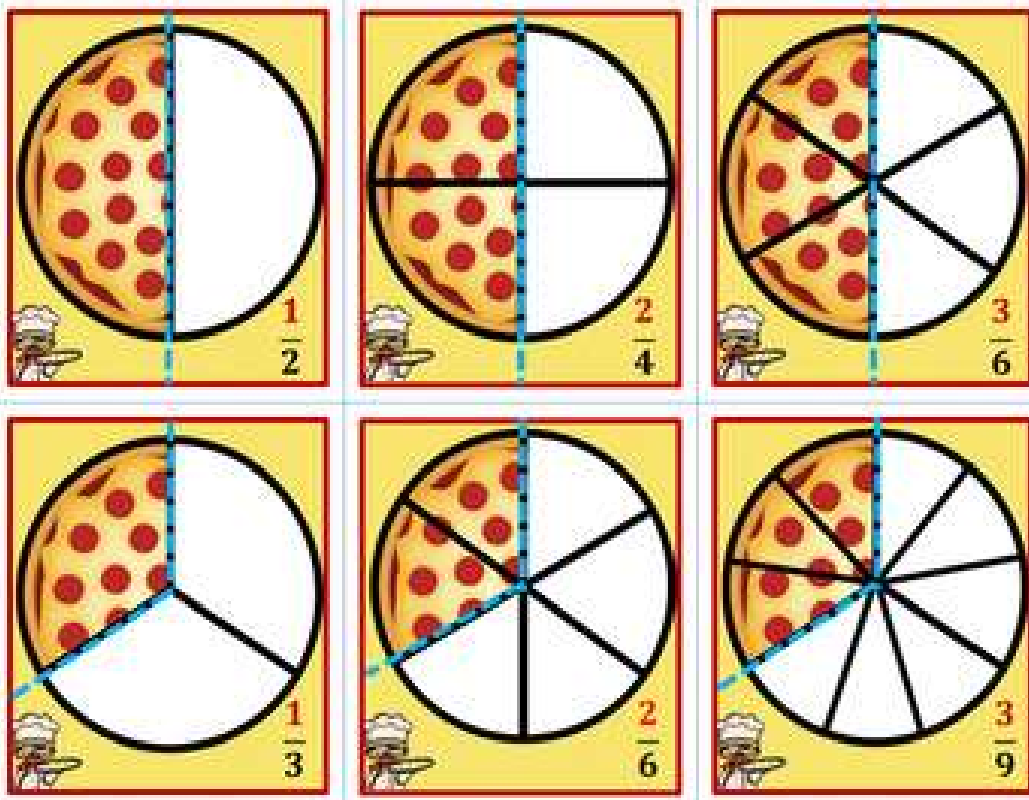
$$1 \text{ lb} = .454 \text{ kg} \quad 1 \text{ kg} = 2.205 \text{ lb}$$

$$1 \text{ ton} = .907 \text{ metric tons}$$

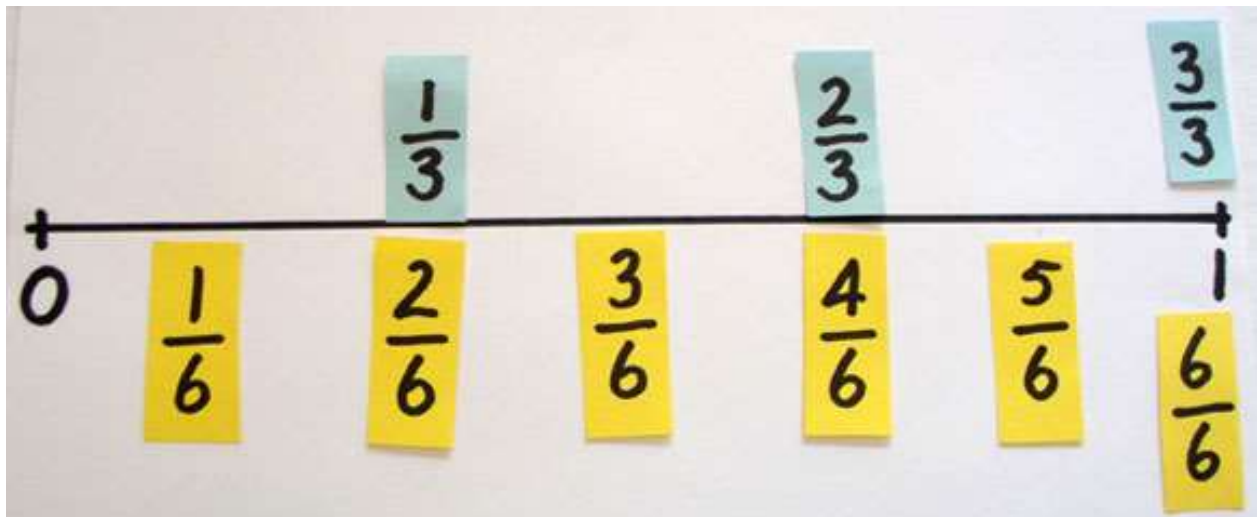
$$1 \text{ metric ton} = 1.102 \text{ tons}$$



## Fractions with Food



## Fractions without Food

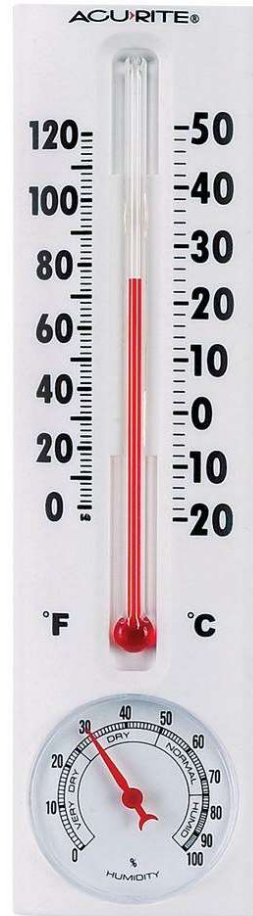


# Describing the Weather with Math

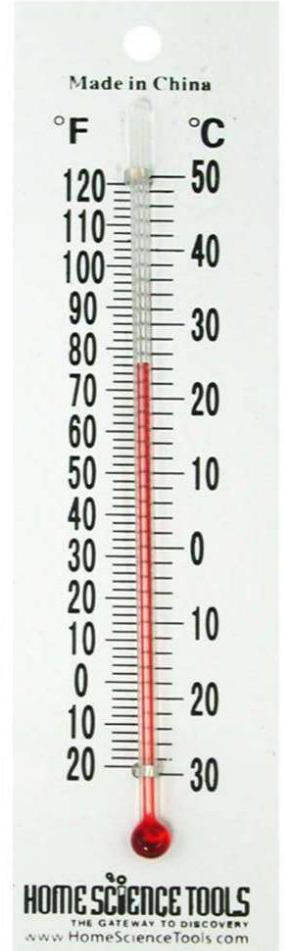
Room A



Room B



Room C



Write sentence(s) to describe the temperature of the room where each item above is located.

Room A

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Room B

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Room C

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Teaching Math with a Medicine Label

**Lakemont** Pharmacy  
4935 Lakemont Blvd. SE, Ste. B4  
Bellevue, WA 98006  
425-644-6080

**0001143** ← 08/31/2013 DR. TEST/TEST

**PATIENT TEST**

**TAKE ONE CAPSULE BY MOUTH THREE TIMES DAILY**

AMOXICILLIN 500 MG CAPSULE Qty 30

Mfg: San 00781-2613-05  
Substituted for Larotid Exp: 8/2014

**NO REFILLS** ← Rph: TEST PHARMACIST RXLOC

Call your Doctor for medical advice about side effects. You may report side effects to the FDA at: 1-800-FDA-1088.

**Warning: State or Federal Law prohibits transfer of this drug to any person other than the person for whom it was prescribed.**

List all the math topics you can teach using a medicine label.

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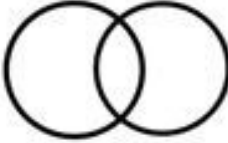


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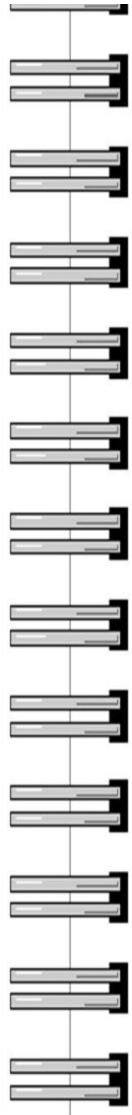
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## Informational Text Structures

Informational Text Structures			
Structure	Meaning	Symbol	Signal words
Description	To tell about something		characteristics are, is like, one example, also, another, to illustrate, to begin with, on top of, in addition..
Order and Sequence	To show events or procedures in time order		First, second, third, next, later, then, before, followed by, finally..
Compare and Contrast	To show how two or more things are alike and different		like, unlike, also, similar, different, too, as well as, however, although, same as..
Cause and Effect	To show why something happened and what happened		so that, due to, this led to, as a result, since, so, for this reason, in order to..
Problem and Solution	To tell about a problem and show a solution		concern, solve, challenge, help, prevent, so that, the answer, one reason is..

© The Teacher Next Door

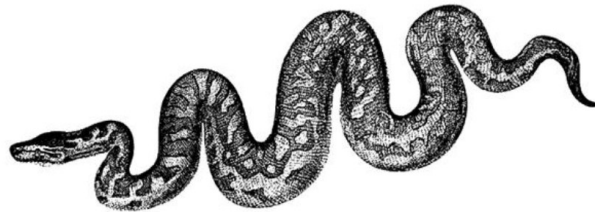
## Sample Informational Text



# Boa Constrictors

(You really got a hold on me)

Boa constrictors are amazing snakes. Like all snakes, boa constrictors are reptiles and **cold-blooded**. Boa constrictors are non-venomous (not poisonous) and must rely on other methods to kill and eat their prey. These snakes kill by constriction, wrapping their body around and squeezing the prey until it dies. (Remember, no warm hugs for these snakes)



Cold-blooded does not mean you have ice running through your veins. Cold-blooded creatures take on the temperature of their surroundings. They are warm when it is warm and cool when it is cool. These creatures move around a lot more when it is warm outside.

Not as big as anacondas, most boa constrictors can be as small as 30 inches (a little smaller than a yardstick) or as big as 10 feet. The biggest one ever found was over 18 feet long. *Use a ruler to measure out 18 feet. Pretty big, huh!* They can weigh over 100 pounds.

Boa constrictors can be found in Central and South America. *Go ahead, look them up on a map.* They will eat almost anything they can catch. They eat birds, other reptiles, monkeys, and even pigs. Their meal of choice is rodent. They are **nocturnal** hunters, searching for a meal in the dark of night. Often, they hang from trees by a cave and wait for a bat to fly by. They don't chew their food up like you and me (you do chew your food, don't you). After the prey has been suffocated, they swallow it whole. If it is a big meal, their jaws can stretch wide to get it all in. They usually live about 20 to 30 years.

Can you identify the text structure?

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When teaching a lesson using this complex informational text, how would you unravel the mathematics competencies? What mathematics competencies would you unravel?

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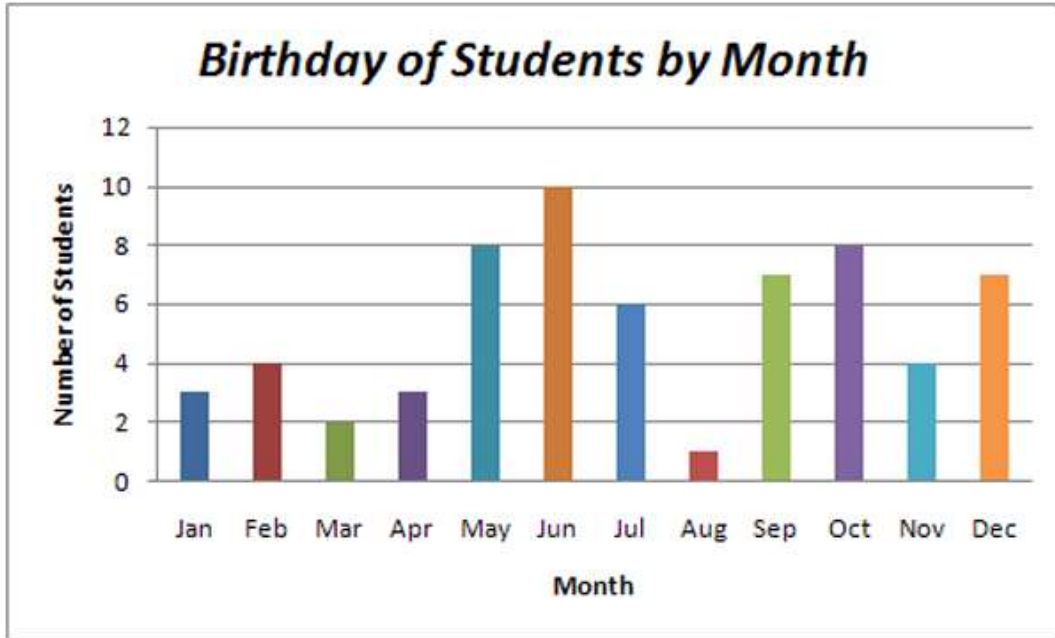
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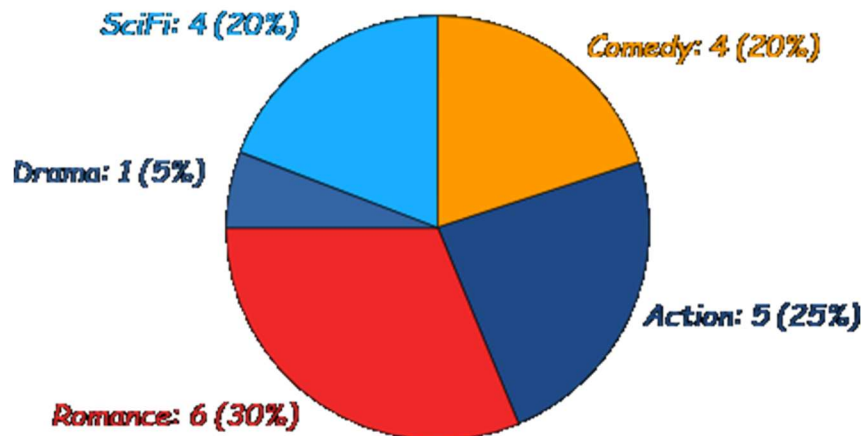


## Reading Charts and Graphs

How would you incorporate the math competencies and CASAS Reading Task Areas when teaching using the sample visuals below?



## ***Favorite Type of Movie***



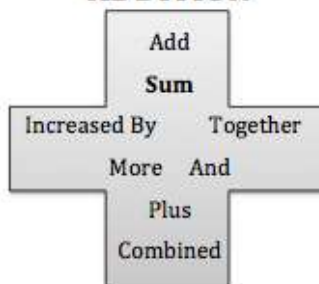
## Translating Math Operations to Words and Vice Versa

# Words for ADDITION +

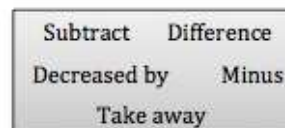
Words that translate to Adding		
plus	added to	the sum of
sum	more than	combined together
and	increased by	heavier than
total	next year	the total of
combined	longer than	older than
still	gain	bigger than
perimeter	together	older than

## Words into Math

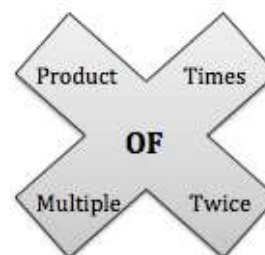
### ADDITION



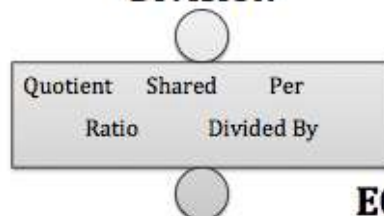
### SUBTRACTION



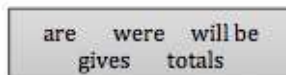
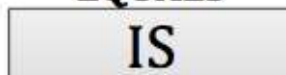
### MULTIPLICATION



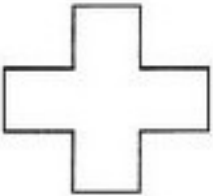

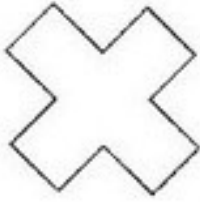
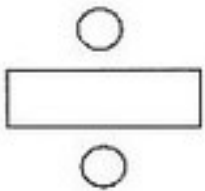
### DIVISION



### EQUALS



# KEYS TO MATH SIGNS

Sign	Look For
<b>ADDITION</b> 	<ul style="list-style-type: none"><li>+ What is the total?</li><li>+ How many altogether?</li><li>+ How many in all?</li><li>+ What is the perimeter?</li><li>+ The sum is...</li><li>+ What is the sum?</li></ul>
<b>SUBTRACTION</b> 	<ul style="list-style-type: none"><li>- How many fewer?</li><li>- How much change?</li><li>- How many are left?</li><li>- The difference is...</li><li>- What is the difference?</li></ul>
<b>MULTIPLICATION</b> 	<ul style="list-style-type: none"><li>x How many altogether?</li><li>x Find multiples of...</li><li>x What is the area?</li><li>x The product is...</li><li>x What is the product?</li></ul>
<b>DIVISION</b> 	<ul style="list-style-type: none"><li>÷ The quotient is...</li><li>÷ What is the quotient?</li><li>÷ Divide into _____ parts.</li><li>÷ How many per...</li><li>÷ What are the factors?</li></ul>