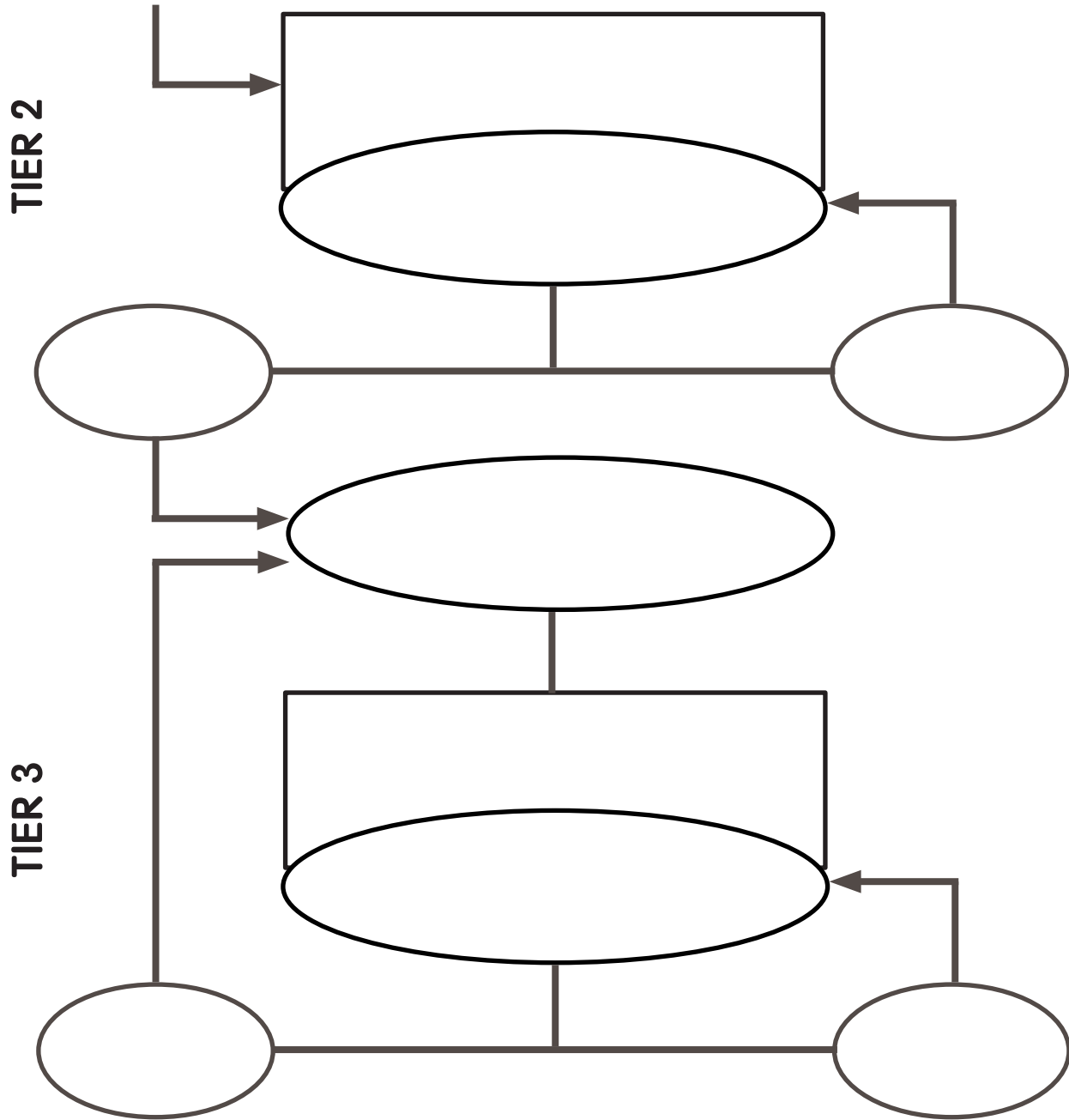
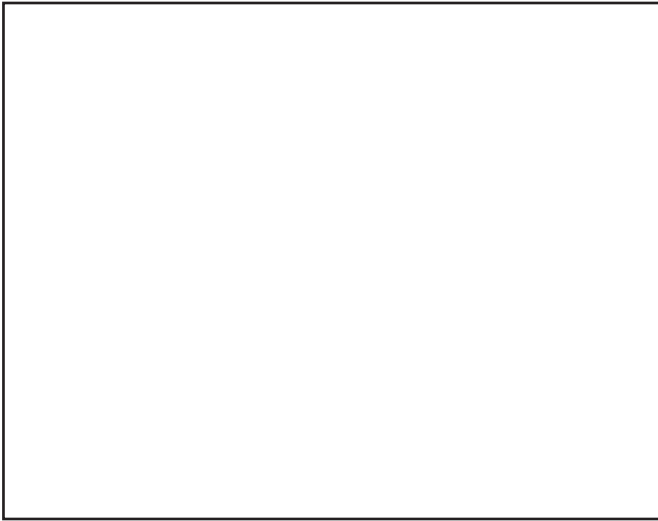
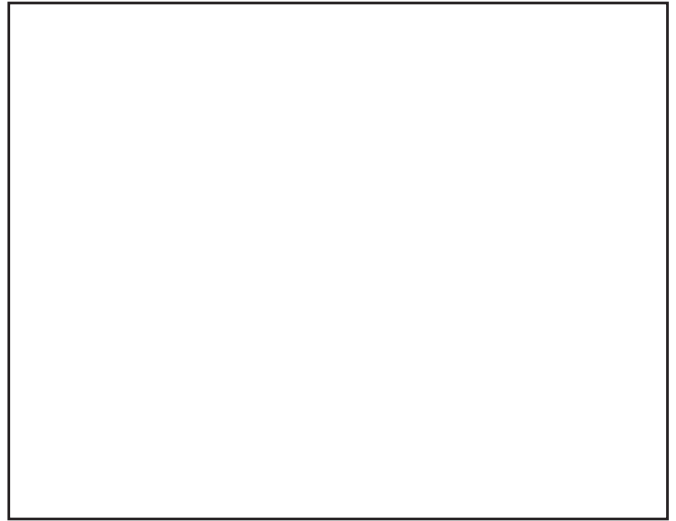
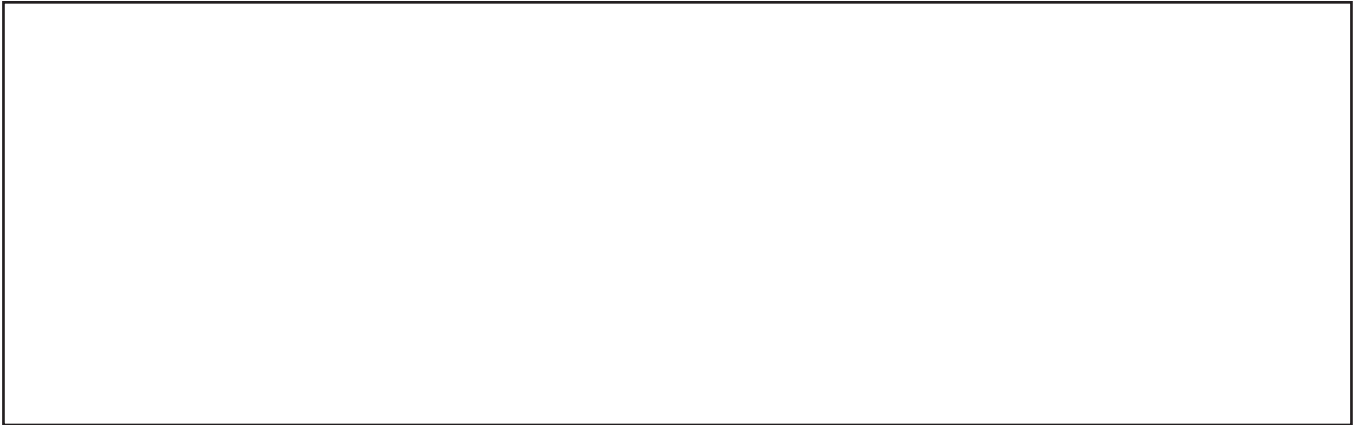


# Multi-Tier Support for Students with Mathematics Difficulty

srpowell@austin.utexas.edu @sarahpowellphd  
www.sarahpowellphd.com



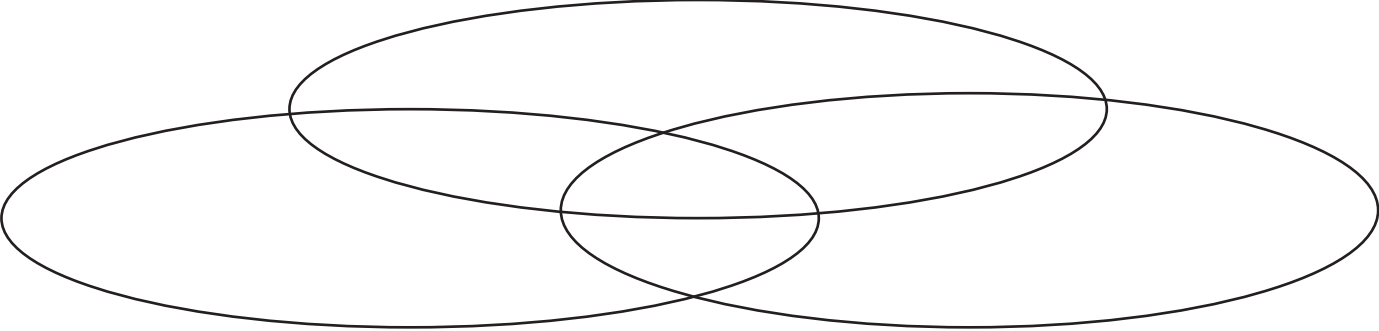
## Explicit Instruction

An empty rectangular box with a black border, intended for notes or content.An empty rectangular box with a black border, intended for notes or content.A large empty rectangular box with a black border, intended for notes or content.

# Mathematical Language

Instead of that...	Say this...

**Multiple Representations**



# Fractions

## Three Models

Fraction	Length	Area	Set
$\frac{2}{3}$			
$\frac{1}{4}$			
$1\frac{1}{2}$			
$\frac{3}{7}$			

## Improper Fractions and Mixed Numbers

### Equivalent Fractions

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

$$\frac{1}{4}$$

### Comparing Fractions

$$\frac{1}{2} \quad \frac{3}{10}$$

$$\frac{2}{6} \quad \frac{4}{6}$$

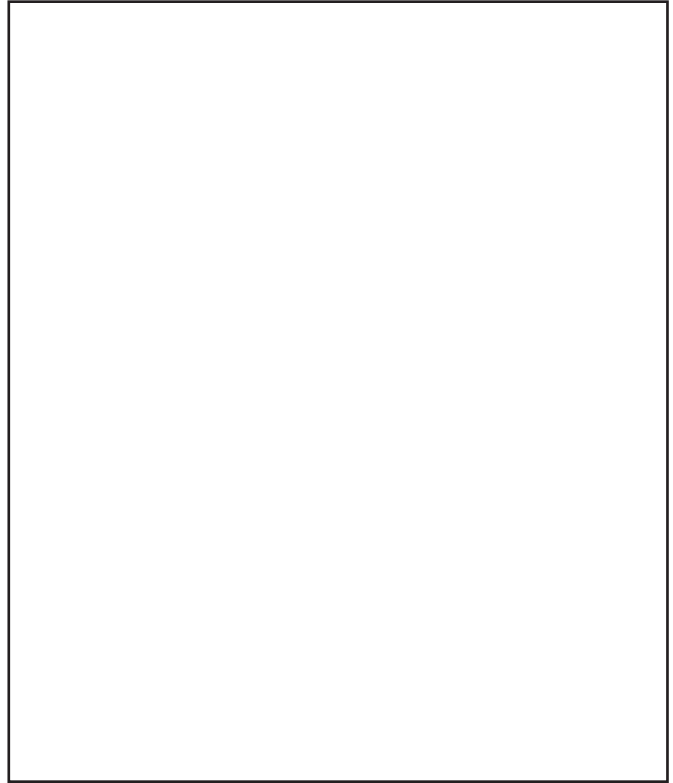
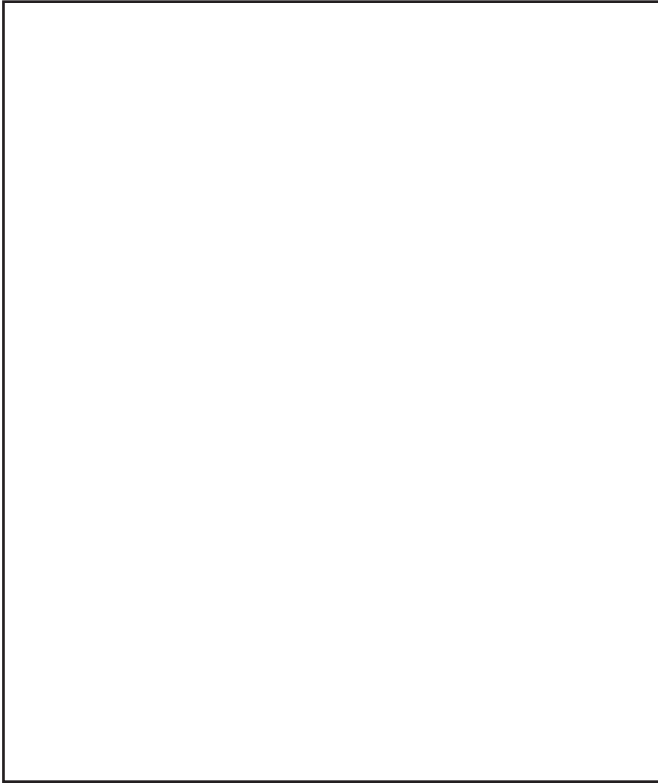
$$\frac{2}{3} \quad \frac{2}{5}$$

### Ordering Fractions

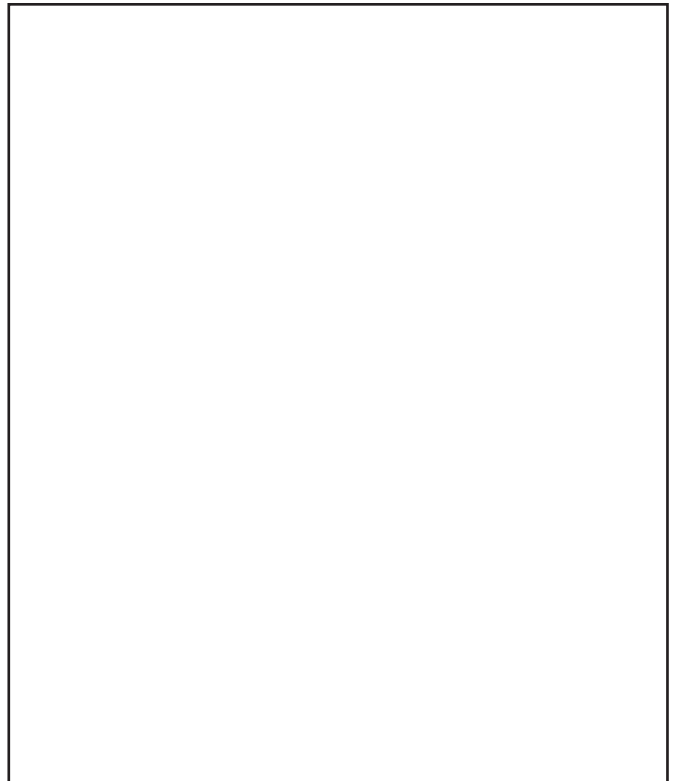
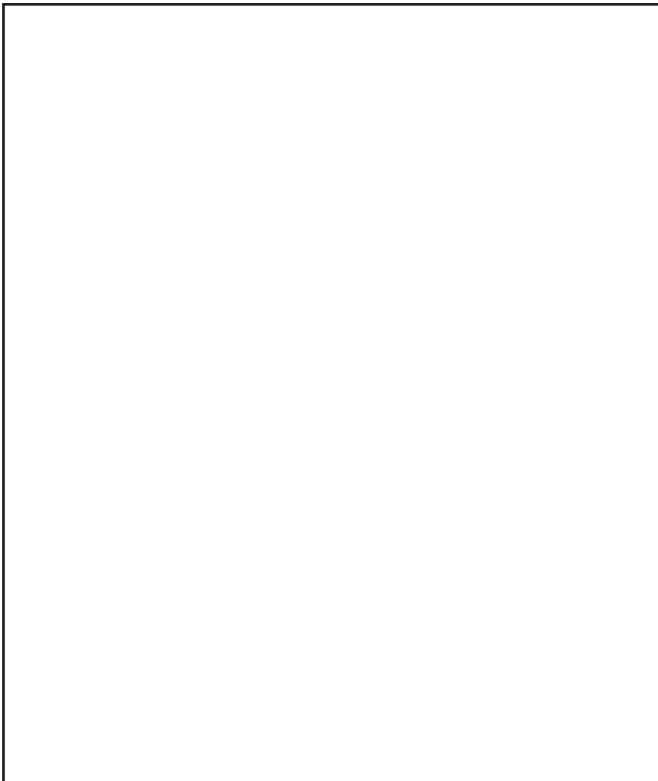
$$\frac{6}{8} \quad \frac{3}{5} \quad \frac{1}{3}$$

# Fluency

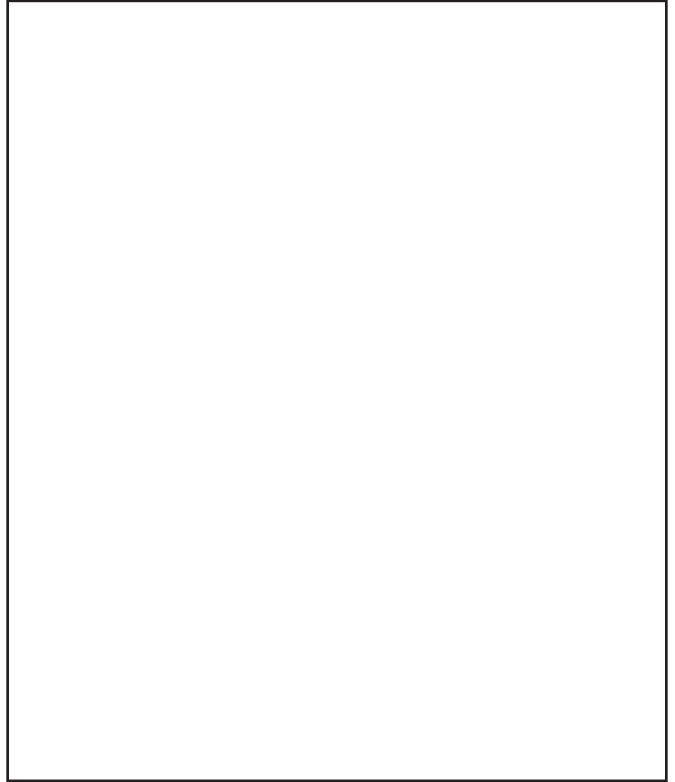
Addition



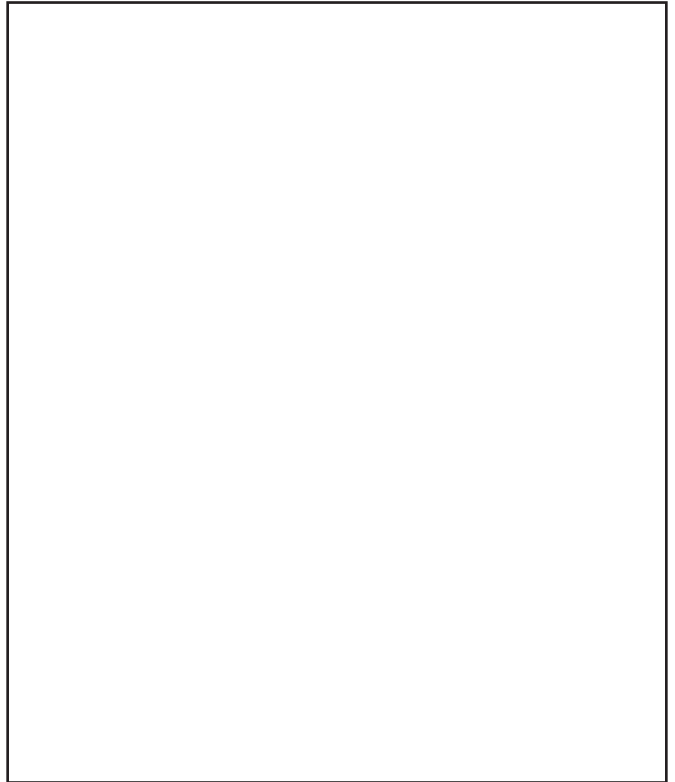
Subtraction



## Multiplication



## Division





Computation: Addition and Subtraction

$$227 + 185 =$$

$$232 - 164 =$$

Computation: Multiplication and Division

$$183 \times 27 =$$

$$815 \div 16 =$$

# Fractions

## Addition and Subtraction

Problem	Representation
$\frac{1}{5} + \frac{3}{5}$	
$\frac{2}{3} + \frac{2}{3}$	
$\frac{1}{2} + \frac{1}{4}$	
$\frac{1}{4} + \frac{4}{6}$	
$\frac{4}{5} - \frac{1}{5}$	
$\frac{6}{5} - \frac{2}{5}$	
$\frac{7}{8} - \frac{2}{4}$	
$\frac{1}{2} - \frac{2}{5}$	

# Fractions

## Multiplication and Division

Problem	Representation
$\frac{1}{2} \times \frac{2}{4}$	
$\frac{1}{2} \times \frac{3}{4}$	
$\frac{4}{5} \times \frac{5}{6}$	
$\frac{1}{4} \times \frac{1}{3}$	
$\frac{2}{3} \div \frac{1}{3}$	
$\frac{5}{6} \div \frac{1}{2}$	
$\frac{7}{8} \div \frac{3}{4}$	
$\frac{1}{4} \div \frac{1}{2}$	

# Problem Solving

Three Things to Remember


Attack Strategies

--

## Additive Word Problems

Problem type	Definition	Examples		Equation	Graphic organizer
<b>Total</b>		Total unknown	Part unknown		
<b>Difference</b>		Difference unknown	Greater unknown		
<b>Change (increase)</b>		End unknown	Start unknown		
<b>Change (decrease)</b>		End unknown	Start unknown		

## Additive Word Problems

A.

Megan baked 28 sugar cookies and 24 chocolate chip cookies. Enter the total number of cookies Megan baked in all.

B.

A banana farm received a total of 12 millimeters of rain in March and April. If 11 millimeters of rain fell on the farm in March, how many millimeters of rain fell on the farm in April?

C.

Jana has 107 wooden beads and 68 glass beads. How many more wooden beads than glass beads does Jana have?

D.

Farmer Hank has 6 more cows than horses. He has 4 horses. He also has 9 chickens. How many cows does he have?

## Additive Word Problems

E.

A bus had 13 passengers. At the next stop, more passengers got on the bus. Now, there are 28 passengers. How many passengers got on the bus?

F.

Martina had some money. Then, she spent \$42 on a sweater. Now, she has \$13. How much money did she have to start with?

G. The animal park has 12 zebras, 25 monkeys, and some giraffes. If the total number of animals is 50, how many giraffes are there?

H. Mrs. Lanier saved \$617 in January. In February, she sent \$249 of the money she saved. She saved \$291 more in March. How many has Mrs. Lanier saved by the end of March?



## Multiplicative Word Problems

Problem type	Definition	Examples	Equation	Graphic organizer
Equal Groups				
Comparison				
Combinations				
Ratios and Proportions				

## Multiplicative Word Problems

<p>A. Ms. Thompson sold 6 cartons of cherries at the Farmers' Market. Each carton holds 25 cherries. How many cherries did she sell?</p>	<p>B. Jane bought 24 light bulbs. The light bulbs come in packs of 4. How many packs of light bulbs did Jane buy?</p>
<p>C. Isabella has 2 times as many DVDs as Emma. Emma has 6 DVDs. How many DVDs does Isabella have?</p>	<p>D. There are 176 slices of bread in 8 loaves. If there are the same number of slices in each loaf, how many slices of bread are in 5 loaves?</p>

## Multiplicative Word Problems

E.

A sea turtle made 460 dives in 12 hours. At this rate, how many dives did the sea turtle make in 3 hours?

F.

Yvette correctly answers 85% of the total questions on her science test. She correctly answers 34 questions. What was the total number of questions on Yvette's science test?

G.

A crocodile is 18 feet long. An alligator is  $\frac{3}{4}$  of that length. How long is the alligator?

H.

Susan has 3 times as many books as Mary. Mary has 18 books. Which equation can be solved to figure out how many books Susan has?

## Multiplicative Word Problems

I.  
Matt bought 1 orange and 3 apples for a total of \$2.25. The orange cost \$0.60. The apples each cost the same amount. What amount did Matt pay to buy each apple?

J.  
There are 12 apple trees. Alex picks 11 apples from each tree. He eats 8 of the apples that he picked. How many apples does Alex have left?

K.  
A teacher buys 6 bags of snack mix. Each bag contains 2.5 cups of snack mix. The snack mix is shared evenly among 30 students. How many cups of snack mix will each student receive?