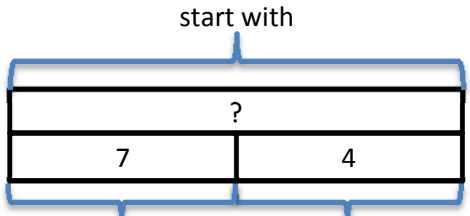
Math 246 Review 2:

1. Draw a bar diagram to show how to solve each of the following word problems, and write the associated equations:

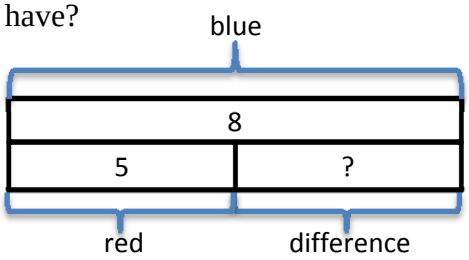
- Addition and subtraction bar diagrams need labels
- Multiplicative comparison bar diagrams need labels
- Other multiplication and division bar diagrams do not need labels
- Each bar diagram needs an addition or multiplication equation (which may be a missing part equation)
- Some bar diagrams should also have a subtraction or division equation.

a. Sandra had 4 erasers left after she gave 7 erasers to her friends. How many erasers did she start with?



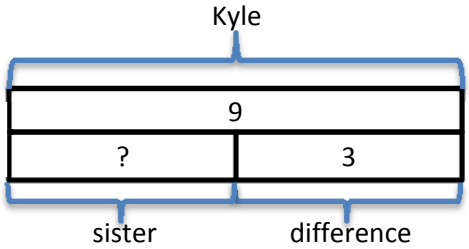
7+4=?
optional: ?-7=4

b. Marie has 8 blue balloons and 5 red balloons. How many more red balloons than blue balloons does she have?



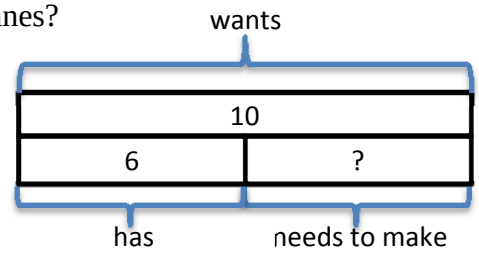
8-5=?
5+?=8

c. Kyle has 9 transformers. He has 3 more than his sister. How many does his sister have?



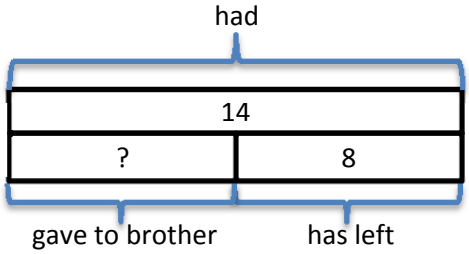
9-3=?
3+?=9

d. Amanda has 6 origami cranes. How many more does she need to make to have 10 origami cranes?



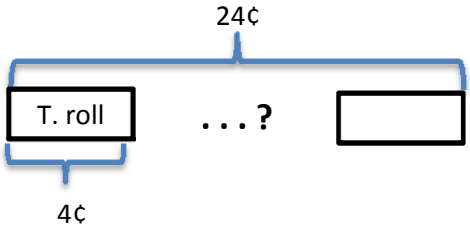
10-6=?
6+?=10

e. Paul had 14 cookies. He gave some to his brother, and now he has 8. How many cookies did he give to his brother?



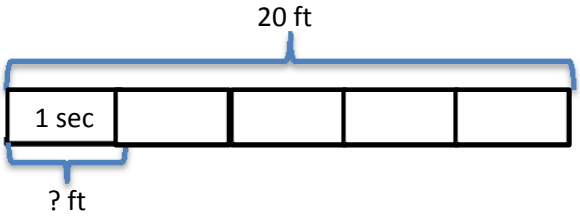
14-8=?
8+?=14

f. A tootsie roll costs 4¢. Ross has 24¢. How many tootsie rolls can he buy?



24 ÷ 4 = ?
4 × ? = 24

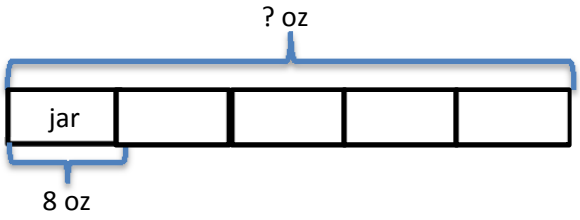
g. A toy train can go 20 feet in 5 seconds. How many feet can it go in one second?



$20 \div 5 = ?$

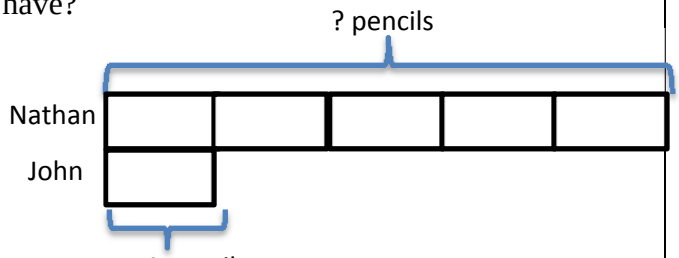
$5 \times ? = 20$

h. A Jar of jam has 8 ounces of jam in it. How many ounces of jam are in 5 jars?



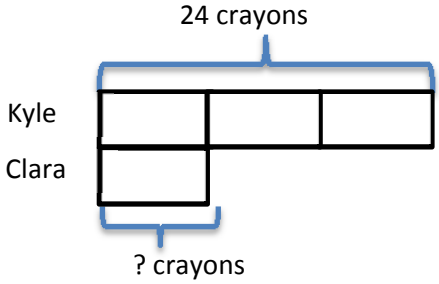
$8 \times 5 = ?$

i. John has 4 pencils. Nathan has 5 times as many pencils as John. How many pencils does Nathan have?



$4 \times 5 = ?$

j. Kyle has 24 crayons. He has 3 times as many crayons as Clara. How many crayons does Clara have?



$24 \div 3 = ?$

$3 \times ? = 24$

2. Show **two ways** of doing each calculation that are **different from the standard algorithm**

a.36 + 29 c. 92 - 38

(many correct solutions, including open number line, expanded, rounding and negative number solutions)

3. Explain (using appropriate base 10 language) the following two steps in the standard subtraction algorithm:

$$\begin{array}{r} 6\ 2\ 8 \\ -\ 2\ 9\ 3 \\ \hline 5 \end{array} \Rightarrow \begin{array}{r} 5\ 12 \\ \cancel{6}\ \cancel{2}\ 8 \\ -\ 2\ 9\ 3 \\ \hline 5 \end{array} \Rightarrow \begin{array}{r} 5\ 12 \\ \cancel{6}\ \cancel{2}\ 8 \\ -\ 2\ 9\ 3 \\ \hline 3\ 5 \end{array}$$

In the first step, I trade a hundred for 10 tens. Write down that there are now 5 hundreds (cross out 6), and there are now 12 tens (instead of 2).

In the second step, I take away 9 tens from 12 tens, which leaves 3 tens. Write 3 in the tens place of the answer.

4. Show how to solve each of these using the appropriate expanded algorithm:
a. 478 + 394 b. 723 – 186 c. 246 × 87

$$\begin{array}{r} 478 \\ +\ 394 \\ \hline 12 \\ 160 \\ 1200 \\ \hline 1372 \end{array}$$

$$\begin{array}{r} 600 \\ -\ 100 \\ \hline 500 \end{array} + \begin{array}{r} 110 \\ -\ 80 \\ \hline 30 \end{array} + \begin{array}{r} 13 \\ -\ 6 \\ \hline 7 \end{array} = 537$$

$$\begin{array}{r} 246 \\ \times\ 87 \\ \hline {\scriptstyle 1}42 \\ {\scriptstyle 1}280 \\ 1400 \\ 480 \\ {\scriptstyle 1}3200 \\ 16000 \\ \hline 21322 \end{array}$$

5. Show how to solve the following problem using scaffolding division in a way that uses easier multiplication facts than the most efficient solution:
8081 ÷ 12

$$\begin{array}{r} 673R5 \\ 12\overline{)8081} \end{array}$$

4800	400
3281	
2400	200
881	
480	40
401	
360	30
41	
36	3
5	673