



Problems A - I - Using Place Value charts and Base 10 blocks to represent decimals

ONES	tenths $\frac{x}{10}$	hundredths
1	1	5

- A. How many ONES? (box showing 100 parts) (1)
 How many tenths (rod of 10 parts) (1)
 How many hundredths? (single units) (5) 1.15



ONES	tenths $\left(\frac{x}{10}\right)$	hundredths $\left(\frac{x}{100}\right)$
0	4	2

- C. How many ONES? (0) How many tenths? (4) Hundredths? (2)
 0.42





ONES	tenths $\left(\frac{x}{10}\right)$	hundredths $\left(\frac{x}{100}\right)$
0	0	1

E. How many ONES? (0) How many tenths? (0)
 How many hundredths? (Units) (1) 0.01

Problems J - O - Fractions: Figure out the missing fraction

These fractions all have the same denominator. The problem gives the fraction for 1 or more parts, then the student needs to find the missing part from the whole. Students can draw and/or use numbers to figure with.

Students are not told what the whole is. Need to understand $4/4$ or $8/8$ or $5/5 =$ the whole amount, depending on the fraction being used.

<p>J. Marty = $1/4$ Carrie = $2/4$ Brother = ?</p> <p>$1/4 + 2/4 = 3/4$ eaten</p> <p>$4/4 - 3/4 = 1/4$ saved for brother</p>	
--	--

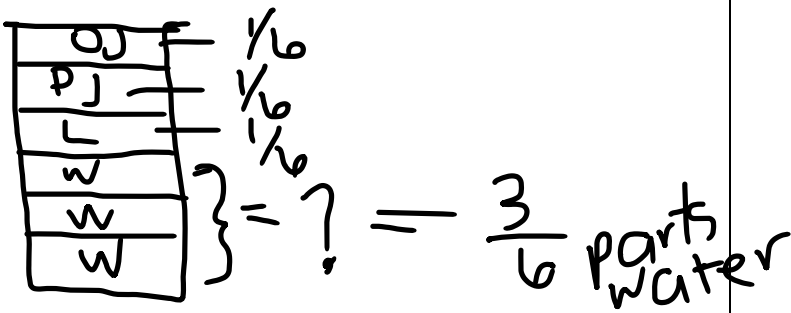
Problems P - R - Addition & Subtraction with decimals

- Need to decide whether to add or subtract
- Need to line up the decimals
 - Problem Q is the tricky one, mixing tenths and hundredths









Sample Solutions – Unit 1

<p>O. OJ = $\frac{1}{6}$ PJ = $\frac{1}{6}$ Lem = $\frac{1}{6}$ Water = x $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6}$ juices $\frac{6}{6} - \frac{3}{6} = \frac{3}{6}$ water (Not told to reduce, but could reduce to $\frac{1}{2}$ water)</p>	
---	--



Unit 2

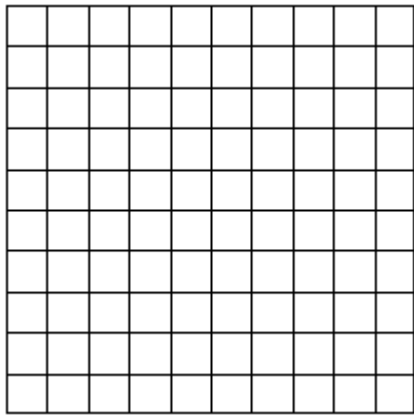
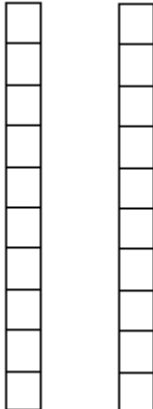

Family Fun Game Answer Key - All Levels

Problem Letter					
A	10 ¢	\$46	$2 \times 5 = 10$ $5 \times 2 = 10$ $10 \div 2 = 5$ $10 \div 5 = 2$		1.25
B	10 ¢	\$59	$5 \times 4 = 20; 4 \times 5 = 20; 20 \div 4 = 5; 20 \div 5 = 4$		1.21
C	12 ¢	\$45	$3 \times 6 = 18; 6 \times 3 = 18; 18 \div 6 = 3; 18 \div 3 = 6$		0.22
D	11 cents	\$40	42		3/6 or 1/2 pizza
E	10 cents	\$90	8		5/8 cards
F	12 cents	\$85	45		3/8 way on bus
G	15 cents	\$37	5 blouses		\$108.55
H	14 cents	\$52	\$4 each		6.4 miles
I	18 cents	\$26	4 in each row		51.2 miles
J	6 + 4	$2 + 7 = 9$ $7 + 2 = 9$ $9 - 2 = 7$ $9 - 7 = 2$	0.76		9
K	5 + 5	$7 + 3 = 10$ $3 + 7 = 10$ $10 - 7 = 10$ $10 - 3 = 7$	0.08		7
L	1 + 9	$6 + 9 = 15$ $9 + 6 = 15$ $15 - 9 = 6$ $15 - 6 = 9$	0.19		9
M	10, 20, 30, 40, 50, 60, 70, 80, 90, 100	22 fish	$\frac{9}{10}$		14
N	9 ants	6 fish were left	$\frac{6}{10}$		42
O	5 bugs	10 tadpoles left	$\frac{4}{10}$		16
P	4 coyotes	$8 + 2 = 10$	(smallest) 0.33; (largest) 0.5		$\frac{1}{6}$
Q	7 sage leaves	$1 + 9 = 10$	11.99		$\frac{1}{6}$
R	$5 - 1 = 4$	$3 + 7 = 10$	Drew		$\frac{5}{8}$



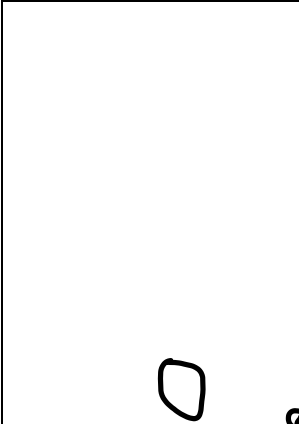
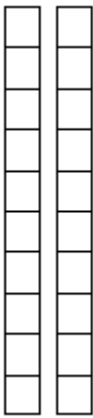



Problems A - C - Using Place Value charts and Base 10 blocks to represent decimals

ONES	tenths $\frac{x}{10}$	hundredths
 1	 2	 5

A. How many ONES? (box showing 100 parts) (1) How many tenths (rod of 10 parts) (2)
 How many hundredths? (single units) (5)

1.25

ONES	tenths $\left(\frac{x}{10}\right)$	hundredths $\left(\frac{x}{100}\right)$
 0	 2	 2

C. How many ONES? (0) How many tenths? (2) Hundredths? (2)

0.22





Problems D - F - Fractions: Figure out the missing fraction

These fractions all have the same denominator. The problem gives the fraction for 1 or more parts, then the student needs to find the missing part from the whole. Students can draw and/or use numbers to figure with.

Students are not told what the whole is. Need to understand $4/4$ or $8/8$ or $5/5 =$ the whole amount, depending on the fraction being used.

<p>E. Cards to school = $3/8$ Cards left home = x</p> <p>whole collection = $8/8$ $8/8 - 3/8 = 5/8$</p> <p>$5/8$ of cards left home</p>	<p>school = $3/8$</p> <p>$\frac{5}{8}$</p> <p>Rest left home</p>
--	--

Problems P - R - Addition & Subtraction with decimals

- Need to decide whether to add or subtract
 - **G:** Meghan starts with \$185 then spends an unknown amount and has \$76.45 left to put back in the bank.
 - How much does she start with? (\$185)
 - How much does she spend? (don't know)
 - How much does she have at the end? (\$76.45)
 - What does this equation look like? ($\$185.00 - \underline{\quad} = \76.45)
 - How can we solve for the unknown amount?
- Need to line up the decimals

HUNDREDS	TENS	ONES	Tenths	Hundredths
\$1	87	54	010	010
-	7	6	4	5
\$1	0	8	5	5

Meghan spent \$108.55





Problems J- L - Finding the Greatest Common Factor (GCF)

4 minute MyTutoringBee 5th Grade YouTube video about GCF, is a helpful demonstration using Factor Tress and making the final decision. <https://www.youtube.com/watch?v=iXi3ntur5I0>

J. Find GCF of 45 and 63

$$\begin{array}{c}
 45 \\
 / \quad \backslash \\
 9 \quad 5 \\
 / \quad \backslash \\
 3 \quad 3
 \end{array}$$

$$\begin{array}{c}
 63 \\
 / \quad \backslash \\
 9 \times 7 \\
 / \quad \backslash \\
 3 \quad 3
 \end{array}$$

$$\begin{array}{l}
 45 - 3, 3, 5 \\
 63 - 3, 3, 7 \\
 \hline
 \text{GCF} = 3 \times 3 = 9
 \end{array}$$

Problems M - O - Finding the Least Common Factor (LCM)

6 minute MyTutoringBee – 5th Grade YouTube video about LCM – The first minute & half is a nice refresher about finding the LCM for small numbers that is needed in this packet.

- Multiply each number by 1, by 2, by 3, etc., until finding an answer (product/multiple) that is the same for both numbers.
 - Useful when adding and subtracting fractions with different denominators
- The rest is about finding the LCM for larger numbers that lost me for a while, and I don't remember needing.
- https://www.youtube.com/watch?v=K_j5WPGiqbU

N. What is LCM of 14 and 42?

$$\begin{array}{l}
 14 - 14, 28, 42 \\
 42 - 42
 \end{array}$$

The LCM = 42

Problems P-R - Adding and Subtracting Fractions

- Common mistakes include
 - adding the numbers in the denominator
 - not remembering that the numbers in the bottom number (denominator) need to be the same
 - how to convert to equivalent fractions





P. $\frac{2}{3} - \frac{1}{2}$

1. Find LCM for the number on the bottom (denominators)

2 ~ 2, 4, 6, 8, 10
 3 ~ 3, 6, 9

2. Convert 2/3 and 1/2 to the equivalent sixths: What number do we multiply the denominator by to reach 6ths? Multiply the top number (numerator) by the same number.

$$\frac{2 \cdot (2)}{3 \cdot (2)} = \frac{4}{6} \qquad \frac{1 \cdot (3)}{2 \cdot (3)} = \frac{3}{6}$$





3. Now you can solve using:

$$\frac{4}{6} - \frac{3}{6} = \frac{1}{6}$$

Remember: The answer needs to use the same denominator (bottom number). Then you can add or subtract to find the fractional part. ($4 - 3 = 1$, so the answer is $1/6$)

Unit 3

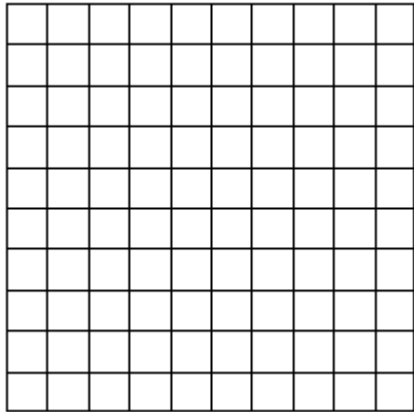
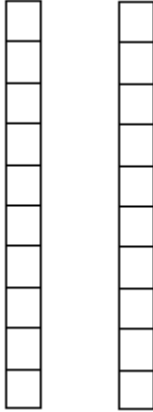

Family Fun Game All Level Answer Key

Problem	 (pink)	 (blue)	 (green)	 (yellow)
A	15 dots Number 15	$7 + 6 = 13$ $6 + 7 = 13$ $13 - 7 = 6$ $13 - 6 = 7$	0.9	1.26
B	5 butterflies Number 5	$5 + 8 = 13$ $8 + 5 = 13$ $13 - 5 = 8$ $13 - 8 = 5$	0.06	1/6 of pizza
C	9 stars Number 9	$7 + 9 = 16$ $9 + 7 = 16$ $16 - 9 = 7$ $16 - 7 = 9$	0.4	32,770.77 miles
D	8 - (Can cut paper pennies for counters)	$8 + 2 = 10$	solution = 169	210.55
E	Count out 15 counters	$3 + 7 = 10$	solution = 143	0.75
F	Count out 10 counters	$5 + 5 = 10$	solution = 195	0.07
G	12 ants	$14 + 5 = 19$ Sue read 19 picture books.	0.45 (smallest); 0.75	0.05, 5%
H	10 leaves	$13 - 9 = 4$ Eddie picked up 4 fewer rocks.	0.7 (largest); 0.56	9
I	3 bugs	Divided into 2 equal or same size pieces.	0.08 (smallest); 0.9	18
J	2 eggs	4 tens and 5 ones 45	$4/6$ is closer to $2/3$ Solve with common denominator = 6 $2/3 = 4/6$ $1/2 = 3/6$	Draw and color tiles or use the paper tiles to show the ratio 4:1 show 4 tiles with one color and show 1 tile with a different color
K	10 eggs	3 tens and 9 ones 39	$1/4$ is closer to $1/8$ Solve with common denominator = 8 $1/4 = 2/8$ $1/2 = 4/8$	Draw and color tiles or use the paper tiles to show the ratio 5:3 show 5 tiles with one color and show 3 tile with a different color
L	8 were brown	6 tens and 6 ones 66	$1/2$ is closer to $6/8$ Solve with common denominator = 8 $1/2 = 4/8$ $1/4 = 2/8$	Draw and color tiles or use the paper tiles to show the ratio 3:7 show 3 tiles with one color and show 7 tile with a different color
M	Penny	5	$8/10 = 0.8$	3:4 and 3/4
N	Penny	12	$4/10 = 0.4$	6:1 and 6/1
O	Dime	46	$7/10 = 0.7$	3:5 and 3/5
P	8 (Blue) cubes On bottom	Ally had 33 cupcakes.	$5 \times 4 = 20$ $4 \times 5 = 20$ $20 \div 5 = 4$ $20 \div 4 = 5$	$x = 3$
Q	9 (red) ovals on right	12 cupcakes were not eaten.	24	$x = 9$
R	10 (red) hearts on left	17 cupcakes were left.	5	$x = 9$




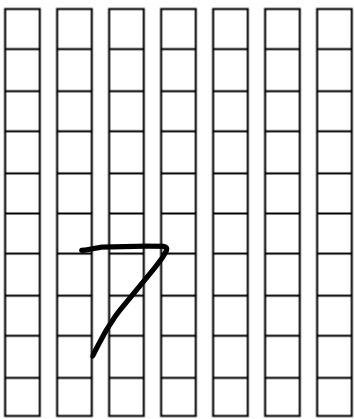



Problems A, E, F, and G - Using Place Value charts and Base 10 blocks to represent decimals

ONES	tenths $\frac{x}{10}$	hundredths
 1	 2	 6

- A.** How many ONES? (box showing 100 parts) (1) How many tenths (rod of 10 parts) (2)
How many hundredths? (single units) (5)

1.2

ONES	tenths $\left(\frac{x}{10}\right)$	hundredths $\left(\frac{x}{100}\right)$
 0.	 7	 5

- E.** There is an extra step to write $\frac{3}{4}$ as a decimal. Some students recognize $\frac{3}{4}$ as $\frac{75}{100}$. If not, students need to find the equivalent fraction first:

- Is "10" a multiple of 4? (no) Is "100" a multiple of 4? (yes – students might know that there are 4 quarters in a dollar, so $2 \times 25 = 100$.)

$$\frac{3}{4} \left(\frac{25}{25}\right) = \frac{75}{100} = \boxed{0.75}$$





Word Problems B, C, D

Problem "B" uses fractions. Students need to consider:

- Are the fractions cut into the same # of pieces (have the same bottom number/denominator?) (*yes, sixths*)
- What needs to happen before solving for how much pizza is left for the brother?
 - How much did Marty and Carrie eat?
- How many pieces did the pizza start with?
 - If cut into 6ths, then started with 6 pieces
 - How do I show 6 pieces in the whole? (draw it, write it in a fraction: 6/6)

<p>B. continued... Marty = $2/6$ Carrie = $3/6$ Brother = ?</p> <p>$2/6 + 3/6 = 5/6$ of pizza eaten</p> <p>$6/6 - 5/6 = 1/6$ 1.6 of pizza was saved for brother</p>	<p>Saved →</p>
--	-----------------------

Problems "C" and "D" use decimals.

- Need to decide whether to add or subtract
 - **C: What do we know?**
 - Do we know how many miles the odometer started at?
 - Yes. 32,345.07 in the morning.
 - Do we know how many miles it changed during the day?
 - Yes. Tym drove 425.7 miles.
 - Is this change adding miles or taking miles away?
 - adding miles
 - Do we know how many miles are on the odometer at the end of the day?
 - No
 - Can we write an equation about what we know and don't know?
 - $32,345.07 + 425.7 = x$
 - **How can we solve for the unknown amount?**





Problem C continued...

Need to line up the decimals

	Ten Thousand	One Thousand	Hundred	Ten	One	Tenths	Hundredths
	3	2	3	4	5	0	7
+			4	2	5	7	
<hr/>							
	3	2	7	7	0	7	7

The odometer read 32,770.77 miles

Problem G - Write the Decimal and the Percent represented

- Write the decimal represented by the blocks
 - Write the equivalent percent by multiplying the decimal by 100
 - Students might need practice solving the long way until **they** recognize a pattern for moving the decimal point 2 places to the right.

G.

Write the decimal

ONES	Tenths	Hundredths
		00000
0	0	5

Write the decimal as a percent

- Multiply the decimal by 100
- How many decimal places do the factors have? **2** decimal places in 0.05

$$\begin{array}{r}
 0.05 \\
 \times 100 \\
 \hline
 5.00
 \end{array}$$

5%

- When multiplying decimals, we need the same number of decimal places in the answer (product) that are in the factors. **(2)**

Solution:

0.05, 5%





Problem H – Finding the Greatest Common Factor (GCF)

4 minute MyTutoringBee 5th Grade YouTube video about GCF, is a helpful demonstration using Factor Trees and making the final decision. <https://www.youtube.com/watch?v=iXi3ntur5I0>

- Make Factor Trees for each number, down to the Prime Numbers (can only multiply by 1)
- List all of the factors in a row. Find which ones are in both. For example, 45 and 27 both have (2) threes. $2 \times 3 = 9$, so 9 is the Greatest Common Factor.

H. Find GCF of 45 and 27

$$\begin{array}{c}
 45 \\
 / \quad \backslash \\
 5 \quad 9 \\
 \quad / \quad \backslash \\
 \quad 3 \quad 3
 \end{array}$$

$$\begin{array}{c}
 27 \\
 / \quad \backslash \\
 9 \quad 3 \\
 / \quad \backslash \\
 3 \quad 3
 \end{array}$$

$$\begin{array}{c}
 45 - 5, 3, 3 \\
 27 - 3, 3, 3
 \end{array}$$

The GCF = 3×3
GCF = 9

Problems I – Finding the Least Common Factor (LCM)

MyTutoringBee – has a six-minute 5th Grade Lesson on YouTube about find the Lowest Common Multiple (LCM) – https://www.youtube.com/watch?v=K_j5WPGiqbU

- The first minute & half is a nice refresher about finding the LCM for small numbers that is needed in this packet:
 - Multiply each number by 1, by 2, by 3, etc., until finding an answer (product/multiple) that is the same for both numbers.
 - Useful when adding and subtracting fractions with different denominators
 - The rest of the video is about finding the LCM for larger numbers that is more complex.

I. What is LCM of 6 and 9?

$6 - 6, 12, 18, 24, 30$
 $9 - 9, 18, 27$

$LCM = 18$





Problems J to O – Expressing Ratios

J- L - Using color tiles to model a ratio

- Students can draw squares or cut out and use the paper squares in the packet, to visualize the ratios. (The color is the same, some squares are blank, and some are filled with a pattern.)

J.	4:1	
-----------	------------	--

L.	3:7	
-----------	------------	--

M - O - Different Ways to express the ratio

Reading Ratios

When written as a fraction, read top to bottom. 	When written with a colon, read left to right.
---	--

M. Different Ways to express the ratio 3 to 4 (student needs 2 ways)

--	--	--





Problems P-R – Solve for x

P. $\frac{1}{3} = \frac{x}{9}$

(1) Find Lowest Common Multiple for the denominators (number telling how many pieces in the whole) (bottom #)

3 ~ 3, 6, 9, 12, 15

9 ~ 9, 12, 18

(2) Convert $1/3$ to the equivalent ninths:

- What number do we multiply the denominator (3) by to reach 9ths?
- Multiply the numerator (top number) by the same number.

$$\frac{1}{3} \frac{(3)}{(3)} = \frac{3}{9}$$

$$x = 3$$

$$3 \times 3 = 9$$

R. $\frac{3}{4} = \frac{x}{12}$

(1) Find Lowest Common Multiple for the denominators (number telling how many pieces in the whole) (bottom #)

4 ~ 4, 8, 12, 16, 20

12 ~ 12, 24

(2) Convert $3/4$ to the equivalent ninths:

- What number do we multiply the denominator by to reach 12ths?
- Multiply the numerator (top number) by the same number.

$$\frac{3}{4} \frac{(3)}{(3)} = \frac{9}{12}$$





$$x = 9$$

$$3 \times 3 = 12$$



Unit 4

Family Fun Game All Level Answer Key

Problem Letter	 (pink)	 (blue)	 (green)	 (yellow)	
A	ate 14 ants	8 + 7 = 15 7 + 8 = 15 15 - 7 = 8 15 - 8 = 7	0.8	6 $\frac{1}{4}$ or 6.25	
B	4 eggs were not broken	5 + 7 = 12 7 + 5 = 12 12 - 7 = 5 12 - 5 = 7	0.80	$\frac{2}{4}$ or 0.5 cups	
C	7 brown eggs	8 + 9 = 17 9 + 8 = 17 17 - 9 = 8 17 - 8 = 9	0.08	\$423,294,920.10	
D	Shows 10 counters and Number 10	38	8	2134.448	
E	Shows 15 counters and Number 15	23	63	\$7400 down payment	
F	Shows 12 counters and Number 12	38	49	10% water	
G	Dime	17	156 flowers	\$48.50 tax	
H	Penny	4 + 6 = 10	5 eggs	\$32.67 late fee	
I	Dime	3 + 7 = 10	21 pounds	\$375 earned	
J	2 pieces are the same size, fair share	Path B is longer.	4 $\frac{3}{4}$	\$39.64 interest	
K	Attempts to cut card or paper in 2 equal pieces	Path A is shorter	9 $\frac{1}{3}$	\$12.20 tip	
L	Halves OR 1 out of 2 equal pieces	A is shorter than B. B is longer than A.	99 $\frac{2}{4}$	25% tip	
M	13 drops of water	49 jelly beans	See 8x4=32 facts below	no. labels flipped	
N	3 thorns	35 fewer	See 6x9=54 facts below	yes. equivalent fractions (scale factor of (x6)	
O	10 miles	52 miles	See 7x8=56 facts below	60 students:1 bus	
P	Set of 5 counters Set of 8 counters Mouse had more (3 more)	18 more	Equivalent to 1/3 can be 2/6 or 3/9 or 4/12....	30 notes hit $\frac{10}{11} = \frac{20}{22} = \frac{30}{33}$	
Q	Set of 12 counters Set of 11 counters Lion saw more 1 more	31 bananas	Equivalent to 1/2 can be 2/4 or 3/6 or 4/8....	$\frac{17}{12}$ or 1 $\frac{5}{12}$	
R	Set of 12 counters Set of 13 counters Mouse saw more 1 more	28 times	Equivalent to 1/4 can be 2/8 or 3/12 or 4/16....	4 $\frac{1}{8}$	

M	N	O
8 x 4 = 32	6 x 9 = 54	7 x 8 = 56
4 x 8 = 32	9 x 6 = 54	8 x 7 = 56
32 ÷ 8 = 4	54 ÷ 9 = 6	56 ÷ 8 = 7
32 ÷ 4 = 8	54 ÷ 6 = 9	56 ÷ 7 = 8



**Problems A and B – Add and Subtract Fractions and Decimals**

Students need to decide if they want to convert all of the numbers to fractions or all of the numbers to decimals.

<p>A. Kayla = 2.75 pieces Carlos = 3 1/2 pieces</p> <p>Need to find: Total slices eaten</p>	<p>If using all fractions:</p> <p>(1) Convert 2.75 to a fraction format:</p> <ul style="list-style-type: none"> • The (2) ONES stay the same • Does student know that $0.75 = 3/4$? So $2.75 = 2 \frac{3}{4}$? • If yes, skip down to Step (2) • Otherwise, work through the steps: <ul style="list-style-type: none"> • 75 hundredths written as a fraction is: <div style="text-align: center; margin: 10px 0;"> $\boxed{0.75} = \frac{75}{100}$ </div> <ul style="list-style-type: none"> • Can we reduce this fraction to make it easier to work with? Yes • Find the Greatest Common Factor <div style="text-align: center; margin: 10px 0;"> </div> <ul style="list-style-type: none"> • And reduce to simplest form <div style="text-align: center; margin: 10px 0;"> $\frac{75}{100} \div \frac{(25)}{(25)} = \frac{3}{4}$ </div> <ul style="list-style-type: none"> • $2.75 = 2 \frac{3}{4}$ <p>(2) Back to the Problem: Do we add or subtract to find the total pizza slices eaten? Add</p> <p>(3) What would this equation look like?</p> <div style="text-align: center; margin-top: 20px;"> $x = 2 \frac{3}{4} + 3 \frac{1}{2}$ </div>
--	--





<p>Reduce:</p> $\frac{5}{4} = \frac{4}{4} + \frac{1}{4}$ $= 1\frac{1}{4}$	<p>(4) Are the denominators the same? No</p> <ul style="list-style-type: none"> Need to find the Least Common Multiple (LCM) for the numbers 4 and 2? 4 ~ 4, 8, 12, 16 2 ~ 2, 4, 6, 8, 10 The Least Common Multiple (LCM) = 4 <p>(5) Solve.</p> $X = 2\frac{3}{4} + 3\frac{2}{4}$ $X = 5\frac{5}{4}$ <p>(5) Reduce</p> $X = 5 + 1\frac{1}{4}$ <p>(6) Label</p> $X = 6\frac{1}{4} \text{ slices}$
<p>A. continued</p> <p>Kayla = 2.75 pieces Carlos = 3 1/2 pieces</p> <p>Need to find: Total slices eaten</p>	<p>If using all decimals:</p> <p>(1) Convert 3 1/2 to a decimal format:</p> <ul style="list-style-type: none"> The (3) ONES stay the same Does the student remember that 1/2 = 0.5 (or 0.50)? If not, work through the steps to find the equivalent fraction of 1/2 <ul style="list-style-type: none"> Decide to find the equivalent in tenths or hundredths? (either way works) It is easiest to convert to a decimal when there is an equivalent fraction in tenths or hundredths $\frac{1}{2} \left(\frac{5}{5} \right) = \frac{5}{10} = \boxed{0.5}$ $\frac{1}{2} \left(\frac{50}{50} \right) = \frac{50}{100} = \boxed{0.50}$ <p>(2) Back to the Problem: Do we add or subtract to find the total slices eaten?</p> <p>Add</p>





(3) What would this equation look like?

$$x = 2.75 + 3.5$$

(4) Solve. (line up the decimals)

ONES	Tenths	Hundredths
2	7	5
+ 3	5	0
6	2	5

(5) Label. *6.25 pieces eaten*

Problems C - E - Addition/Subtraction with Decimals

C- D: Computation. Students need to remember to line up the decimals.

E – Word Problem

Problem D.

TEN THOUSANDS	<u>ONE THOUSANDS</u>	HUNDREDS	TENS	ONES	Tenths	Hundredths	
	9 ⁸	0 ¹⁰	7 ⁶	4 ¹³	0 ⁹	1 ¹¹	8
	6	9	3	9	5	7	0
	2	1	3	4	.4	4	8

Problems F-L - Word Problems using Percent

- F- Percentage parts of the whole
- G – L – one-step problems to find the amount of tax, interest, or tax

Students need to know how to change percentage to decimals and decimals to percent.

- To convert a percentage to a decimal, divide by 100. So 25% is 25/100, or 0.25





- To convert a decimal to percent, multiply by 100. For example, $0.65 \times 100 = 65\%$
- Use a calculator for any you have questions about.

F.

What do you know?

Concrete mix has

- Gravel Ag -37.5%
- Sand – 35%
- Cement – 17.5%
- Water - ?

What do we need to find?

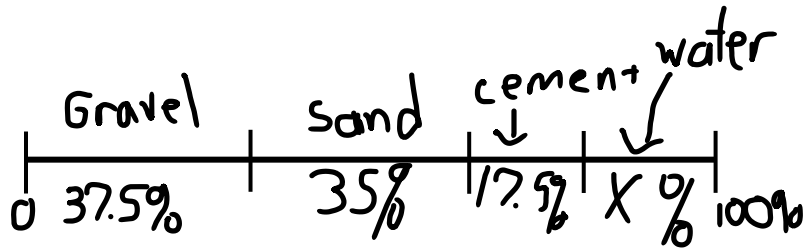
- % water

(1) Does this problem have an action clue, or does it have parts of a whole?

Parts to whole

(2) The problem doesn't tell us what the whole amount is. Is that a mistake or is there a way to figure it out?

- If you eat the whole pizza, you eat 100 %



(3) What do we have to do to solve for the % of water in the cement mixture?

- Add all the parts, using "x" for the water to equal the whole (or)
- Add the parts we know and subtract that total from the whole

(4) Convert the percent to a decimal.

- Use a calculator to divide the fraction:

$$37.5 \div 100 = 0.375$$

$$\boxed{37.5\%} = \frac{37.5}{100} = \boxed{0.375}$$

$$\boxed{35\%} = \frac{35}{100} = \boxed{0.35}$$

$$\boxed{17.5\%} = \frac{17.5}{100} = \boxed{0.175}$$





F continued...

What do you know?

Concrete mix has

- Gravel Ag -37.5%
- Sand – 35%
- Cement – 17.5%
- Water - ?

What do we need to find?

- % water

$$\boxed{100\%} = \frac{100}{100} = \boxed{1}$$

(4) What would an equation look like?

$$0.375 + 0.35 + 0.175 + x = 1$$

(5) Solve for the parts you know:

ONES	Tenths	Hundredths	Thousandths
0.	3	7	5
0.	3	5	5
+	0.	1	7
<hr/>			
0.	9	0	0

(6) Now what does the equation look like?

$$0.9 + x = 1$$

(7) Solve for x.

- Does the student recognize what to add to **0.9** to equal **1.0**?
- Does the student want to subtract?

When subtracting "**1 - 0.9**" it helps to show that "**1**" has "**0**" tenths.

ONES	Tenths	Hundredths	Thousandths
1	0		
-	0	9	
<hr/>			
0	1		

$$x = 0.1$$





	<p>(7) Convert the decimal 0.1 into percentage. (multiply by 100)</p> $\begin{array}{r} 0.1 \\ \times 100 \\ \hline 10.0 \end{array}$ <p>(1 decimal place used in the factors) (1 decimal place added to the product)</p> <p>(8) Solution with label. 10% water</p>
--	---

(G - L) Working with simple Interest / Tip / Fee

- % of A = B

<p>G</p> <p>What do we know?</p> <ul style="list-style-type: none"> • Finding % of how much? \$388.00 • % = 12.5% • % amount = ? tax <p>What do we need to find?</p> <ul style="list-style-type: none"> • How much is 12.5% tax? 	<p>(1) Figure out what information is given and what need to figure out.</p> <p>(2) If you are given the %, divide by 100 to convert it to a decimal.</p> $\boxed{12.5\%} = \frac{12.5}{100} = \boxed{0.125}$ <p>(3) What might the equation look like?</p> <p>• <u>0.125%</u> of <u>\$388</u> = <u>X</u></p> <p>(4) Solve for "x"</p> <p>What do we have to remember when multiplying decimals?</p> <ul style="list-style-type: none"> • Do not have to line up the decimals, but • Need to have the same number of decimal places in the answer. $\begin{array}{r} \$388 \\ \times .125 \\ \hline 7760 \\ 7760 \\ + 38800 \\ \hline \$48.500 \end{array}$ <p>(need 3 decimal places)</p>
--	--





	<p>(5) Write the solution with a label.</p> <p style="text-align: center;">X = \$48.50 tax</p>
--	---

<p>L.</p> <p>What do we know?</p> <ul style="list-style-type: none"> Finding % of how much? \$40 % = ? % amount = \$10 tip <p>What do we need to find?</p> <ul style="list-style-type: none"> What % tip did Jill give? <div style="text-align: center;"> $\begin{array}{r} 0.25 \\ 4 \overline{) 1.0} \\ \underline{8} \\ 20 \\ \underline{20} \\ 0 \end{array}$ </div>	<p>(1) Figure out what information is given and what need to figure out.</p> <p>(2) If you are given the %, divide by 100 to convert it to a decimal. (don't know the % yet)</p> <p>(3) What might the equation look like?</p> $\underline{y} \% \times \underline{\$40} = \underline{\$10}$ <p>(4) Divide each side of the equal sign by <u>\$40</u>, so the "x%" is by itself.</p> $\frac{y\% \times \$40 = \$10}{\cancel{\$40} \quad \cancel{\$40}}$ $x\% = \frac{\$10}{\$40}$ <p>(4) Solve for "x"</p> <ul style="list-style-type: none"> Student can divide 10 by 40 or reduce the fraction 10/40 to 1/4 and then divide. Convert this number to % (multiply by 100) <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\begin{array}{r} 0.25 \\ 40 \overline{) 10.00} \\ \underline{80} \downarrow \\ 200 \\ \underline{200} \\ 0 \end{array}$ </div> <div style="text-align: center;"> $x = 0.25$ $\begin{array}{r} 0.25 \\ \times 100 \\ \hline 25.00 \end{array}$ </div> </div> <p style="text-align: center;">X % = 25%</p> <p>(5) Write the solution with a label.</p> <p style="text-align: center;">Jill gave a 25% tip</p>
--	---





Problems M-P - Ratios

M & N - Determine if statement is true

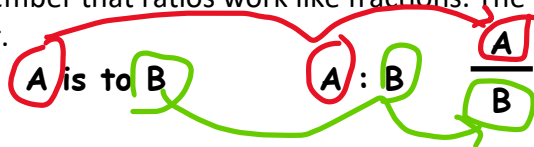
- Are the ratios equivalent?
- Are the things being compared on the same side of the ratio?

<p>M</p> <p>Are the same things being compared on the same side of ratio?</p> <ul style="list-style-type: none"> • No. This has “green” things to “blue things on the top side of the ratio. <p>Are the ratios equivalent?</p> <ul style="list-style-type: none"> • Yes. <p>The statement is FALSE because one part doesn’t work for a ratio.</p>	
---	--

<p>N.</p> <p>Are the same things being compared on the same side of ratio?</p> <ul style="list-style-type: none"> • Yes. This compares dollars on the top side of the ratio, and bags on the bottom side. <p>Are the ratios equivalent?</p> <ul style="list-style-type: none"> • Yes. <p>This statement is TRUE because both parts work to be a ratio.</p>	
--	--

M & N - Use ratios to solve problem

- Remember that ratios work like fractions. The trick is to keep the portions in the right order.





<p>O.</p> <p>1. What do we have to find out?</p> <ul style="list-style-type: none"> How many students would fit on 1 bus? <p>2. What ratio do we use?</p> <ul style="list-style-type: none"> 480 students : 8 buses <p>3. What does the ratio mean?</p> <ul style="list-style-type: none"> 480 students are divided evenly on 8 buses <p>4. Set up the equivalent ratios</p> <ul style="list-style-type: none"> Start with the ratio we are given <u>480 students</u> 8 buses What do we know about the 2nd ratio? There is 1 bus Are buses in the numerator or denominator? 	<p>5. Solve for the equivalent ratio.</p> $\frac{480 \text{ students}}{8 \text{ buses}} = \frac{x \text{ students}}{1 \text{ bus}}$ <ul style="list-style-type: none"> 8 is divided by what to equal 1? $8 \div 8 = 1$ So what do we divide 480 by to find "x"? $\frac{480 \text{ students} \div (8)}{8 \text{ buses} \div (8)} = \frac{60 \text{ students}}{1 \text{ bus}}$ $\begin{array}{r} 60 \\ 8 \overline{)480} \\ \underline{48} \\ 00 \end{array}$ <p>6. Answer question: 60 students : 1 bus</p>
--	---

Problems Q & R - Add and Subtract fractions with different denominators

- Find the LCM (Lowest Common Multiple) for the **denominator** (# of parts in the whole; the "bottom number")

<p>R.</p>	<p>Starting Problem:</p> $15 \frac{7}{8} - 11 \frac{3}{4} = x$ <p>(1) The denominators (number on the bottom of the fraction) are different. What do we have to do?</p> <p>Find the Least Common Multiple (LCM) and find the equivalent fractions</p>
------------------	---





(2) Find the Least Common Multiple (LCM)

$$8 \sim 8, 16, 24 \quad \text{LCM} = 8$$

$$4 \sim 4, 8, 12, 16$$

2. One fraction is already in 8ths, and ready to use.

3. Need to find the equivalent fraction for $11 \frac{3}{4}$.

$$11 \frac{3 \cdot (2)}{4 \cdot (2)} = 11 \frac{6}{8}$$





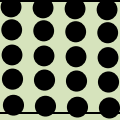
3. Once the denominators are the same size, you can solve.

$$\begin{array}{r} 15 \frac{7}{8} \\ - 11 \frac{6}{8} \\ \hline 4 \frac{1}{8} \end{array}$$

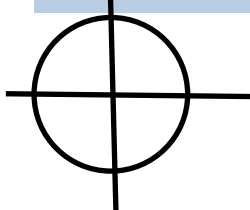


Unit 5

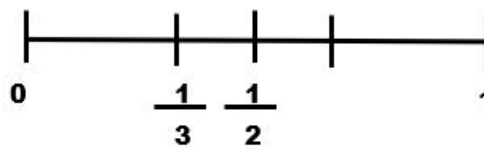
Family Fun Game All Level Answer Key

Problem Letter	 (pink)	 (blue)	 (green)	 (yellow)
A	15 beans counted Number Card 15	$2 + 8 = 10$	\$79.99	Make all decimals: $18.3 + 6.4 - 24.5$ Or make all fractions: $24.5 = 24 \frac{5}{10}$ Solution: 0.2 or $\frac{2}{10}$
B	9 beans counted Number Card 9	$1 + 9 = 10$	$\frac{5}{10}$ or $\frac{1}{2}$ (or any equivalent fraction)	Make all decimals or fractions, then add. 8.25 or $8 \frac{1}{4}$
C	10 beans counted Number Card 10	$7 + 9 = 16$ $9 + 7 = 16$ $16 - 9 = 7$ $16 - 7 = 9$	$\frac{1}{3} = \frac{4}{12}$ $\frac{1}{4} = \frac{3}{12}$ least= $1 \frac{1}{3}$	\$0.01
D	2 cicadas	$8 + 7 = 15$ $7 + 8 = 15$ $15 - 7 = 8$ $15 - 8 = 7$		1,111,111,110
E	8 mice	$12 + 11 = 23$ 23 miles	63	54.657 grams salt
F	9 leaves	$15 + 9 = 24$ He read 24 books	7 groups of balloons	11.92% chemical B
G	PPenny	14	5 pennies per stack	\$27.45 tax
H	Dime	17	30 muffins	\$350 tip
I	Penny	13	0.02	\$90 interest
J	Top bar is more	one fourth OR One out of 4 equal pieces	0.75	\$230 charged
K	set of 9 dots is more	3 friends + me = 4 See circle below	See number line below	3 cups cashews
L	Bar on left is more	Lucy ate 4 cookies.	8.99	10% tip
M	Attempts to cut card or paper into approximately 2 equal pieces	$12 - 8 = 4$ Bob walked 4 miles.	$\frac{1}{4} = 0.4$	False. Green uses (x 5) to get 45, but Blue uses (x 4) to get 40. The scale factors are different.
N	Halves, or 1 out of 2 equal pieces	7	0.07	True. The scale factor is the same for both pounds & dollars: ($\div 4$) or ($\times \frac{1}{4}$).
O	Both pieces are the same size	17		1200 cotton balls in 1 bag
P	7 flowers	65		She would deliver 48 babies in 8 shifts
Q	4 flowers	80		$\frac{12}{12}$ or 1 whole
R	0 frogs	85		Use 15 for the denominator and subtract for the solution $= 2 \frac{7}{15}$

K. Fair Share for 3 friends and me



K. Number Line:



**Problems A and B – Add and Subtract Fractions and Decimals**

Students need to decide if they want all of the numbers written with fractions or decimals. Then figure out how to solve the problem.

<p>B. Marla = 4.75 miles Jesse = Marla + $3 \frac{1}{2}$ miles</p> <p>What do you need to find out? How far Jesse walked.</p>	<p>Do you want to use all decimals or all fractions?</p> <p>(1) If <i>converting to all fractions</i>, need to write 4.75 as a fraction:</p> $4 \frac{75}{100}$ <p>(2) What would the equation look like?</p> $4 \frac{75}{100} + 3 \frac{1}{2} = \boxed{\times}$ <p>(3) Are the denominators the same? NO</p> <p>(4) Find the Least Common Multiple (LCM), so you can find the equivalent fractions.</p> $100 \sim \textcircled{100}, 200, 300$ $2 \sim (2 \times 50 = \textcircled{100})$ $\frac{1 \cdot (\textcircled{50})}{2 \cdot (\textcircled{50})} = \frac{50}{100}$ <p>(5) Solve.</p> $\begin{array}{r} 4 \frac{75}{100} \\ + 3 \frac{50}{100} \\ \hline 7 \frac{125}{100} \end{array} = 7 + 1 + \frac{25}{100} = 8 \frac{1}{4}$ <p>(6) Reduce</p>
---	---





<p>B. continued...</p>	<p>(7) Solution Jesse walked $8 \frac{1}{4}$ miles</p>															
<p>Marla = 4.75 miles Jesse = Marla + $3 \frac{1}{2}$ miles</p> <p>What do you need to find out? How far Jesse walked.</p>	<p>If using all decimals:</p> <p>(1) If using all decimals, need to convert $3 \frac{1}{2}$ to a decimal.</p> <p>$\frac{1}{2} = \frac{5}{10} = 0.5$ $3\frac{1}{2} = 3\frac{5}{10} = 3.5$</p> <p>(2) What would this equation look like?</p> <p>$4.75 + 3.5 = x$</p> <p>(3) Solve. (line up the decimals)</p> <table border="1"> <thead> <tr> <th>ONES</th> <th>Tenths</th> <th>Hundredths</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>7</td> <td>5</td> </tr> <tr> <td>+ 3</td> <td>5</td> <td>0</td> </tr> <tr> <td colspan="3"><hr/></td> </tr> <tr> <td>8</td> <td>2</td> <td>5</td> </tr> </tbody> </table> <p>(5) Answer the question:</p> <p>Jesse walked 8.25 miles.</p>	ONES	Tenths	Hundredths	4	7	5	+ 3	5	0	<hr/>			8	2	5
ONES	Tenths	Hundredths														
4	7	5														
+ 3	5	0														
<hr/>																
8	2	5														

Problems E-L – Word Problems using Percent

Problems E and F

Students need to know how to change percentage to decimals and decimals to percent.

- The whole of the parts = 100%
- To convert a percentage to a decimal, divide by 100. For example, 25% divided by 100 is written as the fraction $\frac{25}{100}$, or 0.25
- To convert a decimal to percent, multiply by 100. For example, $0.65 \times 100 = 65$, so 65%
- Use a calculator!



**F.**

What do you know?

Solution is

- Chemical A -18.06%
- Distilled Water – 70.02%
- Chemical B – ? %

What do we need to find?

- What % is Chemical B?

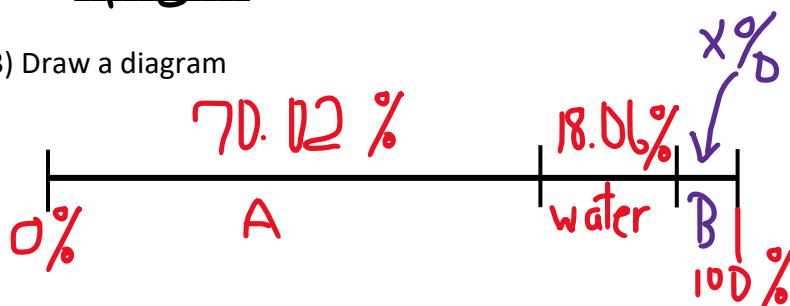
(1) Does this problem have an action clue, or does it have parts of a whole?

Parts to whole

(2) The problem doesn't tell us what the whole amount is. Is that a mistake or is there a way to figure it out?

- When using percent, the WHOLE = 100%
- For example: If you eat the whole pizza, you eat - 100 %

(3) Draw a diagram



(4) What do we have to do to solve for the % of Chemical B in the solution?

- Add all the parts, using "x" for Chemical B, to equal the whole 100%
- (or) can add the parts we know and subtract that total from the whole 100%

(5) Convert percent to a decimal.

$$\boxed{70.02\%} = \frac{70.02}{100} = \boxed{0.7002}$$

- Use a calculator to divide!
(70.02 ÷ 100 = 0.7002)

$$\boxed{18.06} = \frac{18.06}{100} = \boxed{0.1806}$$

$$\boxed{100\%} = \frac{100}{100} = \boxed{1}$$





F continued (6) What would an equation look like?
 $0.7002 + 0.1806 + x = 1$

What do you know?

Solution is

- Chemical A - 18.06%
- Distilled Water – 70.02%
- Chemical B – ?

What do we need to find?

- What % is Chemical B?

(7) Solve for how much is Chemical A and the distilled water:

ONES	Tenths	Hundredths	Thousandths	Ten-Thousandths
0	.	7	0	2
+	0	.	1	8
<hr/>				
0	.	8	8	0

(8) What does the equation look like with this total?

$$0.8808 + x = 1$$

(9) Subtract 0.8808 from both sides of the equation, so “x” is by itself.

$$\begin{array}{r} 0.8808 + x = 1 \\ -0.8808 \\ \hline 0 \end{array} \quad \begin{array}{r} -0.8808 \\ \hline x = 1 - 0.8808 \end{array}$$

(10) Solve for x

ONES	Tenths	Hundredths	Thousandths	Ten-Thousandths
1	.	0	0	0
-	0	.	8	8
<hr/>				
0	.	1	1	9

Subtracting decimals from the whole number:

- $1 = 1.0 = 1.00 = 1.000 = 1.0000$
- Zeros at the end of a decimal to not change the quantity, but help to show how the math works.





	<ul style="list-style-type: none"> Use a calculator to check! $X = 0.1192$ <p>(11) Convert the decimal 0.1192 back into a percentage.</p> <ul style="list-style-type: none"> Multiply by 100 When multiply or divide with decimals, you need to count the decimal places. <p>(12) Write the answer.</p> <p>Chemical B is 11.92% of the solution.</p>
--	---

Handwritten notes and calculations:

0.1192 ← 4 decimal places

X 100

11.9200

11.92%

(G – L) Working with simple Interest / Tip / Fee

- % of A = B**
- In Problem “J,” students need to divide by a decimal. Math with Mr. J has a 6 minute video. <https://www.youtube.com/watch?v=Val4TmjHXRY> (The first example fits the math in this problem.) (English)

<p>J</p> <p>What do we know?</p> <ul style="list-style-type: none"> Tiffany has to pay interest on what she purchases with the credit card each month % Interest = 20% One month, 20% Interest = \$46.00 <p>How much did Tiffany charge that month?</p> <ul style="list-style-type: none"> The interest was 20% of how much? 	<p>(1) Figure out what information is given and what need to figure out.</p> <p>(2) If you are given the %, divide by 100 to convert it to a decimal.</p> $\boxed{20\%} = \frac{20}{100} = \boxed{0.20}$ <ul style="list-style-type: none"> When the “0” is at the end of a decimal, you can keep the “0” or simplify to leave it off because 0.20 and 0.2 are equivalent decimals. Which do you want to use? <p>(3) What might the equation look like?</p> <ul style="list-style-type: none"> <u>20%</u> of <u>\$y</u> = <u>\$46</u> 0.2 × \$y = \$46.00
---	---





Problem J continued...

What do we need to remember when dividing with decimals?

$$\$46.00 \div 0.2$$

We say, "46 dollars divided by 0.2"

Need to make the outside number (the divisor) a whole number.

- Multiply $0.2 \times 10 = 2$

Need to multiply the inside number (the dividend) by the same amount.

- $\$46.00 \times 10 = \460.0

(4) How do you get the variable "y" by itself, on one side of the equal sign? **Divide both sides of the equal sign by 0.2**

$$\frac{0.2 \times \$y}{0.2} = \frac{\$46.00}{0.2}$$

(5) Solve for y

$$\$y = \frac{\$46.00}{0.2}$$

NOTE: Long division and working with the decimal is shown in the right hand column.

(6) Write the solution with a label.

Tiffany charged \$230 to her credit card that month.

Problems M-P - Ratios

M & N - Determine if statement is true

- Are the ratios equivalent?
- Are the things being compared on the same side of the ratio?

M

Are the same things being compared on the same side of ratio?

- **Yes. Comparing GREEN things on the top and BLUE things on the bottom**

Are the ratios equivalent?

- **No**





The statement is **FALSE** because one part of the ratio does not work. GREEN uses (x5) to get 45, but BLUE uses (x4) to get to 40. The scale factors used are different, so is not a ratio.

N.
 Are the same things being compared on the same side of ratio?

- **Yes.** This compares pounds (lbs.) on the top side of the ratio, and dollars on the bottom side of the ratio.

Are the ratios equivalent?

- **Yes, using the same scale factor ($\div 4$)**

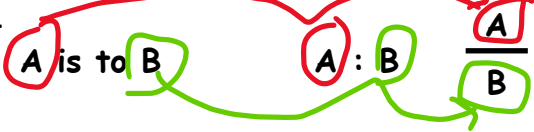
TRUE. This ratio compares the same objects on the same side of the ratio, AND uses the same scale factor for both parts of the ratio.

$$\frac{24 \text{ lbs}}{\$8} = \frac{6 \text{ lbs}}{\$2}$$

$$\frac{24 \div (4)}{8 \div (4)} = \frac{6}{2}$$

O & P - Use ratio to solve problem

- Remember that ratios work like fractions. The trick is to keep the portions in the right order.





O.

1. What do we have to find out?

- How many cotton balls will fit in 1 bag?

2. What ratio are we given to work with?

- 9600 cotton balls : 8 bags

3. What does the ratio mean?

- 9600 cotton balls are divided evenly between 8 bags

4. Set up the equivalent ratios

- Start with the ratio we are given

$$\frac{9600 \text{ cotton balls}}{8 \text{ bags}}$$

- What do we know about the 2nd ratio? **There is 1 bag**
- Are the bags in the numerator or denominator?

5. Solve for the equivalent ratio.

$$\frac{9600 \text{ cotton balls}}{8 \text{ bags}} = \frac{x \text{ cotton balls}}{1 \text{ bag}}$$

- 8 is divided by what to equal 1? $8 \div 8 = 1$
- So what do we divide 9600 by to find "x"?

$$\frac{9600 \text{ cotton balls} \div (8)}{8 \text{ bags} \div (8)} = \frac{1200 \text{ cotton balls}}{1 \text{ bag}}$$

6. Write the solution

1200 cotton balls will fit in 1 bag

Problems Q & R - Add and Subtract fractions with different denominators

- Find the LCM (Lowest Common Multiple) for the **denominator** (# of equal parts the whole object is split into; the "bottom number")

R.

$$3 \frac{2}{3} - 1 \frac{1}{5} = x$$

1. Find the LCM

3 ~ 3, 6, 9, 12, 15, 18, 21

LCM = 15





5 ~ 5, 10, 15, 20, 25

2. Now find the equivalent fractions, where each has a denominator of 15. (When the whole object is broken into 15 pieces, the number on the bottom is 15.)

- For the fraction $\frac{2}{3}$, what do you multiply the denominator (3) by to get 15? 5
- For an equivalent fraction, you need to multiply the numerator (2) by? 5 (the same number)

$$3 \frac{2 \cdot (5)}{3 \cdot (5)} = 3 \frac{10}{15}$$

- For the fraction $\frac{1}{5}$, what do you multiply the denominator (5) by to get 15? 3
- For equivalent fraction, you need to multiply the numerator (1) by 3 (the same number)

$$1 \frac{1 \cdot (3)}{5 \cdot (3)} = 1 \frac{3}{15}$$

3. Once the denominators are the same size, you can add or subtract.

- The denominator stays the same (15).
- Subtract the nominators for the problem ($10 - 3 = ?$) 7
- Subtract any whole numbers ($3 - 1 = ?$) 2

$$\begin{array}{r} 3 \frac{10}{15} \\ - 1 \frac{3}{15} \\ \hline 2 \frac{7}{15} \end{array}$$

