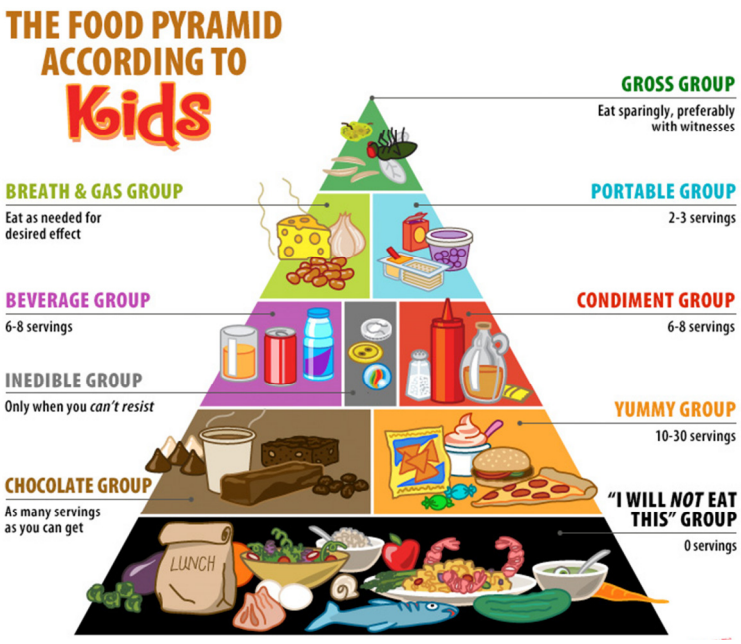
ACCELERATED MATHEMATICS: CHAPTER 6B

FOOD AND RESTAURANTS



PERCENTAGE EQUATIONS TOPICS COVERED:

- Percentages
- Fraction-Decimal-Percentages
- Percent of a number
- Sales, discounts, taxes, and tips
- Create a Menu Project
- Percent equations and/or percent lines
- Simple interest
- Percent of change

Created by Lance Mangham, 6th grade math, Carroll ISD

Activity 6-41: **Percentages** Name:

Percents are a set of fractions that have denominators of 100. What words have the root "cent" which mean 100? Restaurants use percents to determine profits, costs, and loses. Bankers use percents to compute interest. Taxes are determined using percents. In basketball you have a free throw percents, in football quarterbacks complete a certain percent of their passes. Big sales (50% off!) are in percents and even your math grade is a percent!

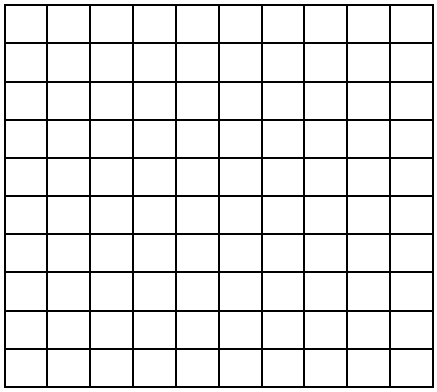
Percent comes from Latin "per centum." Per means out of and centum means one hundred. Thus, percent means out of one hundred.

$\frac{23}{100}$ is a fraction that represents 23 out of 100.

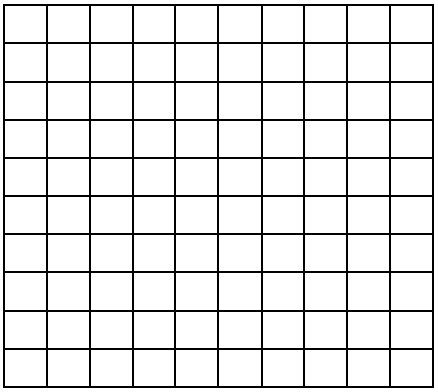
0.23 is a decimal that represents 23 out of 100.

23% is a percent that represents 23 out of 100. $\frac{23}{100} = 0.23 = 23\%$

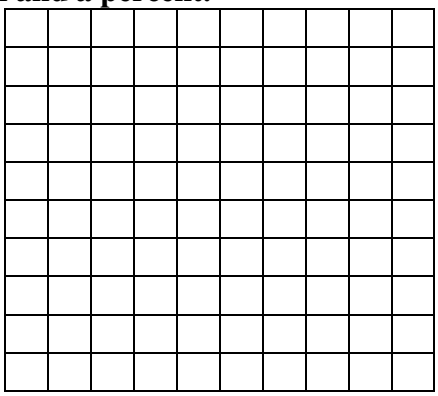
Shade in the indicated amount. Then write the fraction as a decimal and a percent.



$\frac{12}{100}$ = _____ = _____%



$\frac{7}{100}$ = _____ = _____%



$\frac{35}{100}$ = _____ = _____%

Numbers that have 6 as a factor

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$\frac{\quad}{100}$ = _____ = _____%

Numbers that have 7 as a factor

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$\frac{\quad}{100}$ = _____ = _____%

Activity 6-42: **FDP Graphic Organizer** Name:

Percent to Decimal	**Decimal to Percent**
Percent to Fraction	**Fraction to Percent**
Decimal to Fraction	**Fraction to Decimal**

Activity 6-43: **Percentages/Fractions** Name:

Converting percentages to fractions

Percent to a fraction	Write the percent number over 100 and simplify ***Example 1***: $78\% = \frac{78}{100} = \frac{39}{50}$ ***Example 2***: $6.2\% = \frac{6.2}{100} \bullet \frac{10}{10} = \frac{62}{1000} = \frac{31}{500}$

Convert the following percents to fractions in simplest form.

1.	84%		2.	35%		3.	7%	
4.	80%		5.	−10%		6.	99%	
7.	75%		8.	95%		9.	64%	
10.	50%		11.	−4%		12.	28%	
13.	−51%		14.	91%		15.	57%	
16.	33%		17.	48%		18.	−18%	
19.	1.8%		20.	15.75%		21.	0.05%	
22.	−12.5%		23.	1.3%		24.	23.46%	

Convert the following percents to fractions in simplest form.

25.	Mr. Underwood made 72% of his free throws. What fraction did he make?	
26.	Mr. Mangham ate 58% of the Little Debbies in his classroom. What fraction did he eat?	
27.	Principal Hart has a 73% approval rating from the students at DIS. What fraction approve of Ms. Hart?	
28.	64% of Carroll ISD students like french fries. What fraction of students do NOT like french fries?	
29.	99.8% of all DVD's players have no malfunctions in their first year. What fraction have no malfunctions in their first year?	

Express each percent as a fraction or mixed number in simplest form.

30.	0.15%		31.	250%		32.	0.06%	
33.	0.5%		34.	165%		35.	350%	
36.	0.25%		37.	0.1%		38.	110%	

Converting percentages to decimals and decimals to percentages

When converting between percents and decimals, the Dr. Pepper Method serves as a reminder of which way to move the decimal.

Decimal to a percentage	***The Dr. Pepper (DP) Method***  When converting a decimal to a percent, move the decimal point two places to the right. Ex. 3.427 = 342.7%
Percentage to a decimal	***The Dr. Pepper (DP) Method***  When converting a percent to a decimal, move the decimal point two places to the left. Ex. 2.4% = 0.024

Convert between the following decimals and percentages.

1.	65%		2.	70%		3.	5%		4.	9%	
5.	15.7%		6.	3.4%		7.	0.5%		8.	–220%	
9.	–0.05		10.	0.3		11.	2		12.	0.025	
13.	0.525		14.	0.005		15.	0.09		16.	0.6	
17.	–3.5		18.	1.515		19.	.25		20.	0.00625	
21.	–42%		22.	18%		23.	77%		24.	4.2%	
25.	1.8%		26.	–9%		27.	2%		28.	5%	
29.	20%		30.	50%		31.	–0.38%		32.	0.94	
33.	0.75		34.	0.094		35.	0.075		36.	0.04	
37.	0.08		38.	–55		39.	0.8		40.	4.1	

Express each percent as a decimal.

41.	316%		42.	0.02%		43.	0.15%	
44.	2,345%		45.	$\frac{1}{4}\%$		46.	$\frac{1}{2}\%$	

Activity 6-45: **Decimals/Fractions** Name:

Decimal to a fraction	**Simply read the decimal the correct way and simplify** Ex. .318 = three hundred eighteen thousandths = $\frac{318}{1000}$ $\frac{318}{1000} = \frac{159}{500}$

Write each decimal as a fraction or mixed number in simplest form.

1.	0.2		2.	0.28		3.	0.05	
4.	–0.3		5.	0.06		6.	4.75	
7.	9.8		8.	0.625		9.	–0.45	
10.	3.15		11.	7.6		12.	0.004	
13.	0.6		14.	–1.25		15.	0.74	
16.	0.29		17.	0.635		18.	0.8	
19.	6.16		20.	–0.95		21.	0.645	
22.	0.782		23.	0.493		24.	0.758	
25.	–0.33		26.	0.47		27.	0.04	
28.	0.002		29.	–0.65		30.	0.16	

31.	Order $\frac{1}{2}\%$, 50%, 5%, and 500% from least to greatest.	
32.	Write 1.07%, 0.7%, 107%, 0.07% and 1 in order from greatest to least.	

Activity 6-46: **Fractions/Decimals** Name:

Converting fractions to decimals

Fraction to a decimal	**Divide!** ***Example 1*:** $\frac{3}{5} = 3 \div 5 = .6$ If the decimal keeps repeating use bar notation. ***Example 2*:** $\frac{2}{3} = 2 \div 3 = .\overline{6}$

Write each repeating decimal using bar notation.

1.	0.22222…		2.	0.41666…		3.	0.54545…	
4.	0.6363…		5.	0.2727…		6.	0.428572428..	

Express each fraction or mixed number as a decimal. Use bar notation, if necessary.

7.	$\frac{4}{9}$		8.	$1\frac{7}{18}$		9.	$\frac{5}{7}$	
10.	$2\frac{3}{16}$		11.	$-6\frac{1}{12}$		12.	$\frac{8}{11}$	
13.	$-9\frac{2}{5}$		14.	$7\frac{1}{18}$		15.	$-3\frac{24}{25}$	
16.	$4\frac{1}{6}$		17.	$-\frac{6}{7}$		18.	$5\frac{8}{9}$	
19.	$8\frac{2}{3}$		20.	$\frac{5}{16}$		21.	$-\frac{9}{11}$	
22.	$-10\frac{17}{20}$		23.	$-2\frac{11}{18}$		24.	$-6\frac{2}{7}$	
25.	$14\frac{5}{8}$		26.	$-\frac{3}{13}$		27.	$7\frac{9}{10}$	

Order each set of rational numbers from least to greatest.

28.	$1,\ 1.1,\ 1.01,\ 1.\overline{11}$		29.	$2,\ -2,\ -2.1,\ 2.\overline{1}$	
30.	$\frac{2}{3}, \frac{1}{2}, \frac{3}{5}$		31.	$0, -2.1, \frac{3}{2}, \frac{2}{3}$	
32.	$\frac{4}{11}, 0.35, 0.3\overline{6}$		33.	$\frac{3}{4}, \frac{9}{10}, \frac{7}{8}, \frac{2}{3}$	
34.	$-0.3, -\frac{1}{3}, -0.33, -0.35$		35.	$-\frac{5}{6}, -\frac{4}{5}, -0.83, -0.80\overline{1}$	
36.	$0.4\overline{7}, 0.\overline{474}, 0.\overline{47}, 47\%, 47.\overline{4}\%$				

Now that we have learned about bar notation with decimals here is a serious problem for you:

How do you write 0.999999999…. That would be $0.\overline{9}$, right?

Well, 0.9999999….repeated forever equals what?

Would you say that number is equal to 1 or that it is less than 1??? Think about it.

In ordinary math, this number equals one. Does your head hurt yet?

So how can .9999…=1?

There are many different proofs of the fact that 0.9999... does indeed equal 1. So why does this question keep coming up?

Do you agree that 0.3333… is equal to $\frac{1}{3}$?

Remember 0.9999... doesn't mean "0.9" or "0.99" or "0.9999" or "0.999 followed by some large but finite (limited) number of 9's". 0.9999... never ends. There will *always* be another "9" to tack onto the end of 0.9999.... So don't object to 0.9999... = 1 on the basis of "however far you go out, you still won't be equal to 1", because there is no "however far" to "go out" to; you can *always* go further.
"But", some say, "there will always be a difference between 0.9999... and 1."

Well, sort of. Yes, at any given stop, at any given stage of the expansion, for any given *finite* number of 9s, there will be a difference between 0.999...9 and 1. That is, if you do the subtraction, 1 – 0.999...9 will not equal zero. But the point of the "dot, dot, dot" is that there is no end; 0.9999... is inifinte. There is no "last" digit. So the "there's always a difference" argument betrays a lack of understanding of the infinite.

We have learned that $\frac{1}{3} = 0.333...$ in decimal form.

So $\frac{1}{3}+\frac{1}{3}+\frac{1}{3} = 3(\frac{1}{3}) = 1$. Reasonably then, 0.333... + 0.333... + 0.333... = 3(0.333...) should also equal 1.
But 3(0.333...) = 0.999.... Then 0.999... must equal 1.

If two numbers are different, then you can fit another number between them, such as their average. But what number could you possibly fit between 0.999... and 1.000...?

Activity 6-48: **Fractions/Percentages** Name:

Fraction to a percentage	Convert the fraction to a decimal and then the decimal to a percent OR Set up a proportion.

Convert each fraction as a percent.

1.	$\frac{1}{2}$		2.	$\frac{1}{4}$		3.	$\frac{3}{4}$	
4.	$\frac{4}{5}$		5.	$4\frac{1}{10}$		6.	$\frac{3}{10}$	
7.	$-8\frac{1}{3}$		8.	$\frac{9}{10}$		9.	$\frac{1}{8}$	
10.	$\frac{13}{8}$		11.	$\frac{5}{8}$		12.	$\frac{7}{8}$	
13.	$\frac{1}{3}$		14.	$\frac{2}{3}$		15.	$-7\frac{5}{6}$	
16.	1		17.	$5\frac{1}{9}$		18.	$3\frac{23}{50}$	
19.	$\frac{19}{25}$		20.	$3\frac{8}{9}$		21.	$\frac{24}{40}$	

Write <, >, or = to make each sentence true.

22.	$\frac{1}{4}$	$\frac{9}{40}$	23.	$11\frac{13}{40}$	$11\frac{3}{8}$
24.	$1\frac{3}{8}$	1.375	25.	$\frac{2}{25}$	$\frac{22}{250}$
26.	2.78	$2\frac{39}{50}$	27.	$\frac{3}{10}$	$\frac{29}{100}$

28.	What is the sum of 0.5 and $\frac{3}{4}$?	
29.	What is the product of 0.5 and $\frac{3}{4}$?	
30.	What is $\frac{\frac{3}{4}}{0.5}$?	

Which number is the least?

31.	$\frac{3}{8}, 0.4, \frac{4}{11}, 0.03\overline{5}, \frac{5}{13}$	
32.	$\frac{7}{9}, 0.778, 0.\overline{78}, \frac{11}{13}, 0.787$	

Activity 6-49: **Genetic Traits** Name:

Genetic traits are characteristics that are passed from the parents to their children. Children receive half of their traits from their mother and half from their father. Some traits have a wide variety (eye color, hair color), while others have only two possible forms. In this activity you will identify some common genetic traits and find the percent of students in our class that possess each.

Complete the table below with your partner.

Trait	**Description**	**You**	**Class Total**	
Handedness	(A) Left or (B) Right			
Hairline	(A) Straight or (B) Peaked			
Dimples	(A) Yes or (B) No			
Freckles	(A) Yes or (B) No			
Hair Whorl	(A) Clockwise or (B) Counterclockwise			
Ear Lobe	(A) Free or (B) Attached			
Tongue	(A) Roller or (B) Non-roller			

Find the percent of each trait in the class and complete the table below. Round to the nearest tenth.

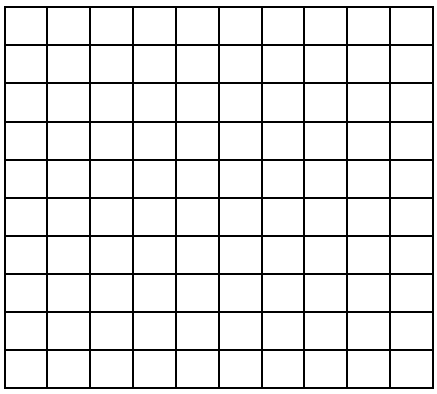
Trait	**Class Percent**			
Handedness	Left		Right	
Hairline	Straight		Peaked	
Dimples	Yes		No	
Freckles	Yes		No	
Hair Whorl	Clockwise		Counterclockwise	
Ear Lobe	Free		Attached	
Tongue	Roller		Non-roller	

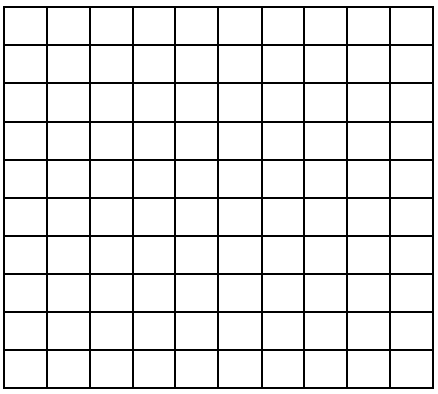
1.	Do the traits add up to 100%? Explain why or why not?	
2.	What is the most common trait in our class?	
3.	Do we have any traits evenly distributed throughout our class?	

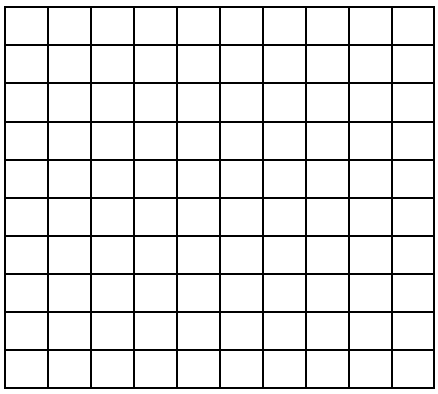
Activity 6-50: **100%** Name:

For each grid select from below a different combination of numbers whose sum is 100%. An item may be only used once in a combination, but may be used again in a different combination. Write your selection on the line below each grid. Shade the squares in the grid with a different color for each number selected.

68%	$\frac{1}{2}$	60%	$\frac{1}{20}$	1%	0.9	0.04	$\frac{13}{20}$
$\frac{1}{7}$	16%	55%	0.02	$\frac{3}{25}$	0.15	$\frac{1}{9}$	24%
0.44	0.06	$\frac{1}{8}$	29%	0.037	$\frac{1}{6}$	19%	$\frac{1}{4}$
$\frac{1}{3}$	$\frac{17}{50}$						







_____ _____ _____

You are helping with a bike race. There are three statements about the bike race below. Draw a picture to represent each statement. Use one of each of the three models for fractions: area, group, and length.

Statement 1: The bike race is $\frac{3}{8}$ of a mile.

Statement 2: 52% of the bike riders are women.

Statement 3: This is the first bike race for three out of every eight people in the bike race.

Activity 6-51: **Mixed Conversions** Name:

Convert between fractions, decimals, and percentages to complete the table below.

	Fraction (simplified)	**Decimal**	**Percent**
1./2.			Taco Bell has 2.2% of the fast food market.
3./4.			McDonalds has 7.8% of the fast food market.
5./6.			Dairy Queen has 1.2% of the fast food market.
7./8.			1.5%
9./10.			150%
11./12.		Dominoes has 0.011 of the fast food market.	
13./14.		Subway has 0.013 of the fast food market.	
15./16.		KFC has 0.018 of the fast food market.	
17./18.		Burger King has 0.034 of the fast food market.	
19./20.		1.25	
21./22.	Pizza Hut has $\frac{1}{40}$ of the fast food market.		
23./24.	Hardees has $\frac{3}{200}$ of the fast food market.		
25./26.	Wendys has $\frac{1}{50}$ of the fast food market.		
27./28.	$\frac{24}{25}$		
29./30.	$\frac{16}{25}$		

On a separate sheet of paper, place the following numbers in order from greatest to least.

31.	$0.875, \frac{9}{10}, \frac{15}{16}, 0.98, 100\%, 9\%$	32.	$75\%, 0.55, \frac{13}{20}, 45\%, \frac{17}{20}$
33.	$1\%, 0.001, \frac{1}{99}, \frac{1}{101}, 0.1$	34.	$0.9, 85\%, \frac{9}{10}\%, \frac{1}{2}$
35.	On your separate paper rank the top 10 fast food restaurants listed above in order of market share (greatest to least).		

Activity 6-52: **Fraction/Decimal/Percents** Name:

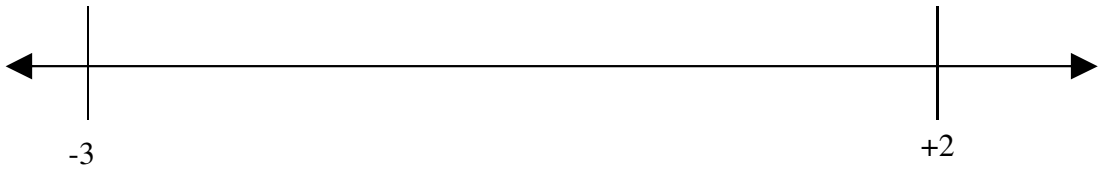
Fraction, Decimal, Percentage Conversions	
Percent to a fraction	Write the percent number over 100 and simplify Ex. $78\% = \frac{78}{100} = \frac{39}{50}$
Decimal to a percentage	***The Dr. Pepper (DP) Method***  When converting a decimal to a percent, move the decimal point two places to the right. Ex. $3.427 = 342.7\%$
Percentage to a decimal	***The Dr. Pepper (DP) Method***  When converting a percent to a decimal, move the decimal point two places to the left. Ex. $0.024 = 2.4\%$
Decimal to a fraction	**Simply read the decimal the correct way and simplify** Ex. 0.318 = three hundred eighteen thousandths $= \frac{318}{1000}$ $\frac{318}{1000} = \frac{159}{500}$
Fraction to a decimal	**Divide!** **Ex.** $\frac{3}{5} = 3 \div 5 = .6$ If the decimal keeps repeating use bar notation. **Ex.** $\frac{2}{3} = 2 \div 3 = .\overline{6}$
Fraction to a percentage	Convert the fraction to a decimal and then the decimal to a percent OR set up a proportion. Ex. $\frac{3}{5}$ so, $\frac{3}{5} = \frac{x}{100}$, $x = 60\%$

Place the following numbers on the number line below.

$$-0.25, \frac{6}{8}, \frac{2}{3}, -2, 0.75, 1.5, -1, \frac{2}{5}, 0, -0.6, \frac{3}{2}$$

$$100\%, -150\%, 42\%, -3.7\%, 0.37\%, 78\%, -75\%$$

$$1\frac{2}{5}, -0.4$$



Activity 6-54: **Rational Numbers** Name:

Write the number that is the greatest.

1.	$\frac{3}{5}, \frac{5}{7}$		2.	$\frac{4}{9}, \frac{5}{11}$		3.	$3\frac{2}{11}, 3\frac{1}{9}$	
4.	$0.2, \frac{2}{11}$		5.	$0.25, \frac{5}{21}$		6.	$8\frac{10}{27}, 8.3$	
7.	$-\frac{8}{13}, -\frac{5}{13}$		8.	$-\frac{2}{5}, -\frac{6}{7}$		9.	$-\frac{2}{9}, -\frac{9}{11}$	
10.	$-4.5, -4.55$		11.	$-3.57, -3.5$		12.	$-1.9, -1.99$	

Order from greatest to least.

13.	$-5.81, -5\frac{3}{4}, -5\frac{3}{5}, -5.69$	
14.	$-1.01, -1.1, -1\frac{1}{9}, -1\frac{1}{11}$	

Write the ratio that is indicated in each row. Then circle the percent that is equivalent to it.

	A	**B**	**Ratio**		
15.	one dozen pears	48 pears	A to B		0.25% 2.5% 25%
16.	hours in a day	seconds in a minute	A to B		0.4% 4% 40%
17.	months in a year	minutes in 1 hour	B to A		5% 50% 500%
18.	1 meter	meters in 1 kilometer	A to B		0.1% 1% 10%
19.	days in 3 weeks	months in 2 years	A to B		0.865% 8.75% 87.5%
20.	letters in *mountain*	letters in *ratio*	B to A		6.25% 62.5% 160%
21.	months that begin with J	total number of months	B to A		400% 133% 75%
22.	six dozen	six	A to B		12% 120% 1200%
23.	ounces in a pound	quarts in a gallon	B to A		16% 25% 400%
24.	years in a decade	years in a century	A to B		1% 10% 50%
25.	number of letters in billion	number of digits in the numeral for one billion	A to B		7% 70% 77%
26.	number of edges in a cube	number of vertices in a cube	B to A		150% $66\frac{2}{3}\%$ 15%

Activity 6-55: **Big Blank Number Line** Name:

(Adapted from Dinah Chancellor, 1998)

Cut out the fraction, decimal, and percent cards below. Organize the cards from ***greatest to least***.

$\frac{1}{4}$	$\frac{3}{6}$	$-\frac{7}{4}$	$\frac{9}{11}$	$\frac{2}{7}$	$-\frac{3}{7}$	$\frac{6}{5}$	$\frac{19}{20}$
$-\frac{50}{100}$	$-\frac{1}{6}$	$\frac{5}{4}$	$-\frac{11}{17}$	$-\frac{8}{5}$	$\frac{33}{100}$	$\frac{66}{100}$	$\frac{1}{15}$
0.67	1.75	–0.45	$1\frac{3}{7}$	$24.\overline{4}\%$	1.64	0.89	–1.82
$\frac{7}{8}$	0.05	$1.\overline{37}$	$\frac{0}{8}$	$1.\overline{2}$	0.56	0.75	1
$\frac{23}{40}$	$\frac{2}{3}\%$	59%	–43%	198%	29%	0.01%	71%
31%	100%	–60%	–0.167	–0.4%	88.8%	–7%	–15%
$0.\overline{8}$	$\frac{3}{11}$	$1.3\overline{7}$	$-0.\overline{5}$	$0.\overline{323}$	$0.\overline{01}$	$0.62\overline{1}$	$0.6\overline{21}$
$-1\frac{2}{3}$	$-1\frac{7}{8}$	–0.08	–0.9	–199%	–82%	$\frac{3}{5}\%$	$-\frac{9}{5}\%$

Kelsey, Katie, and Lauren decided to have pizza party. They are trying to decide which pizza restaurant has the best deal. The local pizza places and their prices are listed below.

Dominos, $8.50, eight slices per pizza
Pizza Hut, $10.25, ten slices per pizza
Papa Johns, $6.25, six slices per pizza

All slices are the same size and there is no taste preference between restaurants. Assume 28 friends, plus the three girls, are coming to the party. You should plan for each person wanting to eat 2 slices of pizza. They girls are not sure if you can order these pizzas by the slice or not. Kelsey says Dominos is the best deal, Katie says Pizza Hut, and Lauren says Papa Johns. Can all three be right or is only one (or two) of them correct about the best deal? Why?

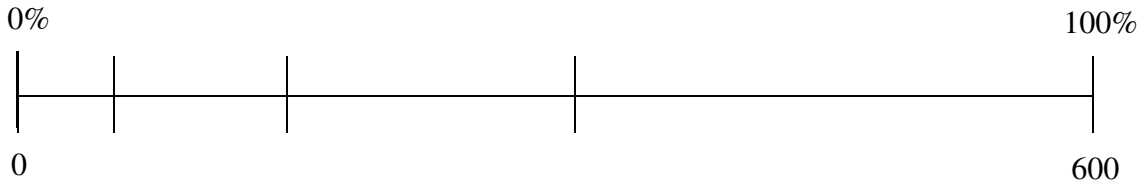
Be sure to label and explain all work.

Activity 6-57: **Percent Lines** Name:

Gallop surveyed people in the United States concerning their favorite food.

Favorite Foods in America (yes, this was a true survey)

1.	Hamburgers	4.	Oreo Cookies	7.	Ice cream
2.	Hot Dogs	5.	Pizza	8.	Donuts
3.	French Fries	6.	Chicken Tenders	9.	Potato Chips



The following questions are based only on the 6000 people who voted for hamburgers, hot dogs, french fries, or pizza.

1.	10% voted for pizza. How many people voted for pizza?	
2.	25% voted for hot dogs. How many people voted for hot dogs?	
3.	50% voted for hamburgers. How many people voted for hamburgers?	
4.	15% voted for French fries. How many people voted for French fries?	
5.	What percentage of people did not vote for French fries?	
6.	How many people did not vote for pizza?	
7.	What percentage of people did not vote for hot dogs?	

Number	0%	10%	25%	50%	100%
20					
40					
120					
800					

%	Pattern
0	
10	
25	
50	
100	

Activity 6-58: **Percent of a Number** Name:

Use the information in the box below and mental math to help you solve the problems.

Percent	Fraction	Decimal	Means	What To Do
200%	2	2.00	twice as much	Multiply by 2
100%	1	1.00	the same as the number	Write the number
75%	$\frac{3}{4}$	0.75	$\frac{3}{4}$ as much	Multiply by $\frac{3}{4}$ or 0.75 (divide by 4, then multiply by 3)
50%	$\frac{1}{2}$	0.5	$\frac{1}{2}$ as much	Multiply by $\frac{1}{2}$ or 0.5 (or divide by 2)
25%	$\frac{1}{4}$	0.25	$\frac{1}{4}$ as much	Multiply by $\frac{1}{4}$ or 0.25 (or divide by 4)
10%	$\frac{1}{10}$	0.1	$\frac{1}{10}$ as much	Multiply by $\frac{1}{10}$ or 0.1 (or divide by 10)
1%	$\frac{1}{100}$	0.01	$\frac{1}{100}$ as much	Multiply by $\frac{1}{100}$ or 0.01 (or divide by 100)

Solve mentally.

1.	100% of 16		2.	10% of 80		3.	50% of 60	
4.	200% of 10		5.	25% of 104		6.	50% of 50	
7.	200% of 4		8.	100% of 23		9.	25% of 96	
10.	100% of 200		11.	50% of 40		12.	25% of 100	
13.	10% of 150		14.	75% of 40		15.	100% of 10	
16.	10% of 230		17.	50% of 38		18.	10% of 200	
19.	200% of 7		20.	10% of 240		21.	25% of 44	
22.	100% of 12		23.	200% of 6		24.	10% of 400	
25.	5% of 500		26.	1% of 300		27.	1% of 1000	

Activity 6-59: **Percent of a Number** Name:

Find the percent of each number.

1.	75% of 52		2.	40% of 65		3.	15% of 80	
4.	30% of 24		5.	62.5% of 96		6.	9% of 20	
7.	28% of 75		8.	95% of 60		9.	70% of 15	
10.	12% of 300		11.	85% of 48		12.	125% of 16	
13.	0.6% of 5		14.	36% of 175		15.	48% of 50	
16.	160% of 90		17.	65% of 120		18.	87.5% of 56	
19.	5% of 85		20.	2.5% of 4		21.	0.4% of 150	
22.	120% of 70		23.	37.5% of 104		24.	52% of 25	

Solve each word problem.

25.	Michael read 35% of his 140-page book. How many pages did he read?
26.	Lisa delivered 75% of her 120 newspapers. How many papers did she deliver?
27.	Of the 368 students enrolled at Carroll Middle School, 276 take either band or choir. What percentage of CMS's students take band or chorus?
28.	25% of Johnson's 132 fourth graders made the honor roll. One-third of the honor roll students made straight A's. How many fourth graders made straight A's?
29.	In a basketball game, Jenna made 50% of her 3-point shots, 75% of her 2-point shots, and 100% of her free throws. If Jenna attempted 14 3-pointers, 8 2-pointers, and 1 free throw, how many points did she score?
30.	What percent of the states in the United States have two word names?
31.	Brad just celebrated his eighth birthday. His dad's age is 375% of Brad's. How old will Brad's dad be in three years?
32.	50% of one year equals how many weeks?
33.	40% of the states are larger in area than Georgia. What is Georgia's rank in area?
34.	25% of a gallon of milk equals how many ounces?
35.	50% of three dimes, three nickels, and three pennies equals…
36.	75% of a yard equals how many inches?
37.	25% of the band and choral students at Carroll Middle School are in beginning band, which is made up of one-third girls. How many girls are in beginning band?
38.	75% of the months that end with the letter "y" have ____ days each.
39.	59% of a piano's keys are white. What's the difference between the percentage of white keys and black keys?

Activity 6-60: **Creating a Menu** Name:

You now get to create a menu for your restaurant! The menu should include the following items:

A restaurant name

A menu with prices for every item

The menu should contain at least:
3 appetizers
6 entrees (main dishes)
5 side items
4 desserts
5 beverages (no alcohol)

A daily discount (percent off your total food cost)

Please have each item listed a la carte (individually) – no combo meals.

Items on the menu must be edible. Prices should be somewhat realistic.
Review standard meal prices on your summary form.

Ideas for a Theme/Concept	**Choosing a Name**
A certain style of food	Name of someone significant to you
An individual dish	Geography
Ethnic influence	Historic or traditional names and spaces
Décor and ambience	Ethnic and cultural names
A character from a book, movie, or TV show	Pop culture
Sporting events, hobbies, or games	Weather
Geography	Humor and irony

Menus nominations for awards will be given for the following categories:
Best Theme
Best Hand-Drawn Logo
Most Creative Original Restaurant Name
Most Creative Food Item Name/Description
Best Original Slogan
Best Overall Presentation
Best "Extra" Item
Best Overall Menu (based on fun, creativity, and originality)

IMPORTANT: If you use another student's name in any way as part of your menu you must obtain their permission first.

Activity 6-61: **Creating a Menu** Name:

Restaurant Name				
Type of Restaurant (circle one) Examples: Fast Food/Fast Casual – McDonalds, Jason's Deli, Chick-Fil-A, Wingstop Casual Dining – Chili's, Olive Garden, Joe's Crab Shack Fine Dining – An expensive steakhouse or seafood place		Fast Food	Casual Dining	Fine Dining
Theme/Style				
Number of Seats (circle one) **Make sure your prices are in the right range.**	Fast Food	50	75	100
	Casual	150	175	200
	Fine	75	100	125
Total meal price per person (for planning purposes)	Fast Food	Lunch = $4-8, Dinner = $5-10		
	Casual	Lunch = $7-15, Dinner = $12-25		
	Fine	Lunch = $15-50, Dinner = $20-75		

	Menu Item	Price
My Best-Selling Appetizer		
Top 4 Selling Entrees		
Top 3 Selling Side Dishes		
Top 3 Selling Drinks		
Top 2 Selling Desserts		

Activity 6-62: **Menu Finances** Name:

The next step to determine the overall income for your restaurant is to find out the average amount of money you would make in one day. ***You may use a calculator to find the following numbers.***

A	Average price of my 4 best-selling entrees	
B	Average price of my 3 best-selling side dishes	
C	Average price of my 3 best-selling drinks	
D	Average price of my 2 best-selling desserts	
E	Price of my best-selling appetizer	

Average Lunch Check per Person = 0.75(A + B + C + 0.2D)
Average Dinner Check per Person = 0.25E + A + 1.6B + C + 0.4D

F	Average Lunch Check per Person [Max (7/13/30)]	
G	Average Dinner Check per Person [Max (9/23/65)]	

Next, you need to find out how many people you will serve each day. Restaurants call this the number of covers. This is based on table turnover or how many people eat per each seat in your restaurant. Find your turnover in the chart below.

		TURNOVER
LUNCH	Fast Food	4
	Casual	1.5
	Fine	0.5
DINNER	Fast Food	6
	Casual	2
	Fine	1.25

So how much money does your restaurant bring in during lunch and during dinner?

Lunch = Average Lunch Check per Person • Turnover • Number of Seats
Dinner = Average Dinner Check per Person • Turnover • Number of Seats

Meal	**Average Check**	**Turnover**	**Seats**	**Total Revenue**
Lunch				
Dinner				
Total per Day				
Total per Month (Total per Day • 30)				
Total per Year (Total per Month • 12)				

Activity 6-63: **Sample Expense Report/Income Statement** Name:

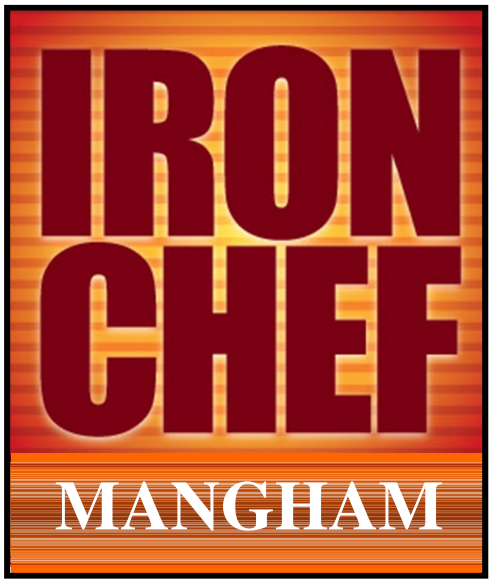
Because there is always a little bit of chance and luck in any type of business, you are going to introduce a bit of chance to your restaurant. Roll a single die 6 times are record your results below.

1st roll	
2nd roll	
3rd roll	
4th roll	
5th roll	
6th roll	

Using your results above, circle the correct percentage on each of the following lines. These percentages will be used to calculate various financial aspects of your restaurant.

	1	**2**	**3**	**4**	**5**	**6**
1st roll	30%	31%	32%	33%	34%	36%
2nd roll	28%	26%	25%	24%	23%	21%
3rd roll	28%	29%	30%	31%	32%	34%
4th roll	8%	7%	6%	5%	4%	3%
5th roll	14%	15%	16%	17%	18%	20%
6th roll	5%	6%	7%	8%	9%	11%

This unit is being brought to you by:



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Expense Report/Income Statement

		Percentage	Monthly Example ***
Total Revenue	A		$270,000
Food Sales	B	90%	$243,000
Beverage Sales	C	10%	$27,000
Food Cost	D	35%	$85,050
Beverage Cost	E	28%	$7,560
COGS (Cost of Goods Sold)	F	**34.3%**	**$92,610**
Gross Profit	G	**65.7%**	**$177,390**
Payroll	H	30%	$81,000
Benefits	I	4.4%	$11,880
Total Payroll	J	**34.4%**	**$92,880**
Direct Operating Expenses*	K	5%	$13,500
Marketing/ Entertaining/Advertising	L	1.5%	$4,050
Energy/Utilities	M	3.5%	$9,450
General/Administrative	N	4%	$10,800
Repairs/Maintenance	O	2%	$5,400
Total Operating Expenses	P	**16%**	**$43,200**
Gross Operating Profit	Q	**15.3%**	**$41,310**
Rent/Lease expenses	R	4.3%	$11,610
Real estate taxes	S	2%	$5,400
Insurance	T	1.2%	$3,240
Total Other Expenses	U	**7.5%**	**$20,250**
Adjusted Profit	V	**7.8%**	**$21,060**
Interest	W	1%	$2,700
Depreciation	X	2%	$5,400
Net Income (Profit/Loss)**	Y	**4.8%**	**$12,960**

* Telephone, accounting, legal, office supplies, paper, china, glass, menus, landscaping, cleaning supplies, etc.
** Net income before income taxes
*** Average monthly sales per Chili's restaurant

Activity 6-65: **Expense Report/Income Statement Directions** Name:

Item	How To Complete
A	On your Menu Finances page you already determined the monthly income for your restaurant. Copy this number in Box A.
B	We will use the industry average of about 90% of sales coming from food items. **B = 90% of A**
C	The remaining 10% of sales are for beverages. **C = 10% of A**
D	Restaurants use the food cost percentage to help determine the price of menu items. Typically, the price of the food may be about 3 times the ingredients it takes to prepare the food. That would be a food cost percentage of 33%. Most places target between 20-40% for this number. $\text{Food Cost Percentage} = \frac{\text{Cost of Raw Ingredients}}{\text{Selling Price}} \bullet 100$ **D = Dice #1 % of B**
E	Same as D, except beverages usually have a lower percentage because the cost is so low that restaurants can make a higher percentage profit on drinks. **E = Dice #2 % of C**
F	Cost of goods sold or COGS. For the dollar amount: **F = D + E**
G	Your gross profit is how much you made on the food and drink before you take out all your other expenses. **G = A – F**
H, I, J	Now you have to pay all of your managers, waiters, cooks, etc. They get paid a certain amount plus you have to pay for their benefits, like health insurance. **H = Dice #3 % of A** **I = Dice #4 % of A** **J = H+I**
K to P	Next, you add all the other expenses in owning a restaurant - the cost of plates and utensils, menus, furniture, and kitchen supplies, advertising your business, phone and electricity, paperwork, repairs, maintenance of your building and grounds….the list goes on and on. **P = Dice #5 % of A**
Q	Now you have your gross operating profit. **Q = G – J – P**
R, S, T, U	Next you have to pay for your occupancy (rent, equipment rental, real estate taxes, insurance, property taxes, etc.) **U = Dice #6 % of A**
V	Your adjusted profit is: **V = Q – U**
W, X	Deprecation is an accounting process of spreading out your capital costs over time. Interest is what you have to pay on all loans you have taken out to run the restaurant. **W and X are a % of A**
Y	The bottom line! Hopefully you are making money! Most profitable restaurants will have a bottom line of 3-8%. This means for every $100 they sell, they make between $3 and $8. **Y = V – W – X**

Expense Report/Income Statement for _____

		Percentage		Monthly
Total Revenue	A			
Food Sales [% of A]	B	90%		
Beverage Sales [% of A]	C	10%		
Food Cost [% of B]	D	Roll #1 =		
Beverage Cost [% of C]	E	Roll #2 =		
COGS (Cost of Goods Sold)	F	**D + E =**		
Gross Profit	G	**A – F =**		
Payroll [% of A]	H	Roll #3 =		
Benefits [% of A]	I	Roll #4 =		
Total Payroll	J	**H + I =**		
Direct Operating Expenses	K	around 5%		
Marketing/ Entertaining/Advertising	L	around 1.5%		
Energy/Utilities	M	around 3.5%		
General/Administrative	N	around 4%		
Repairs/Maintenance	O	around 2%		
Total Operating Expenses [% of A]	P	Roll #5 =		
Gross Operating Profit	Q	**G – J – P =**		
Rent/Lease expenses	R	around 4%		
Real estate taxes	S	around 2%		
Insurance	T	around 1.2%		
Total Other Expenses [% of A]	U	Roll #6 =		
Adjusted Profit	V	**Q – U =**		
Interest [% of A]	W	1%		
Depreciation [% of A]	X	2%		
Net Income (Profit/Loss)	Y	**V – W – X =**		

Restaurant Name	
Owner	
Server	
Guest	
Chef	

Items Ordered			**Price**
Appetizer			
Entrée			
Side Item			
Beverage			
Dessert			
Other			
******* TOTAL (before daily discount) *******			
Daily discount	**____ %**	**Calculate x% of your total above**	
******* TOTAL FOOD PRICE ***** [Total – Daily discount]**			**(A)**

			Guest Calculations	*Server Calculations*
Tax	**8% = _____** (convert to decimal)	Calculate 8% of (A)		**(B)**
Subtotal before tip		Add (A) + (B)		**(C)**
Tip 10% poor, 15% good, or 20% excellent service	**____ % = _____** (convert to decimal)	Choose a tip Calculate x% of (A)	**(D)**	
Total bill		Add (C) + (D)	**(E)**	
Amount of CASH given to server (you only have $50 bills)		A multiple of $50 large enough to pay for the bill	**(F)**	
Change provided to customer		Subtract (F) – (E)		**(G)**
Restaurant Profit for Owner	**6% = _____** (convert to decimal)	Calculate 6% of (A)		**(H)**
Amount of tip for Server	**50% = _____** (convert to decimal)	Calculate 50% of (D)		**(I)**
Amount of tip for Chef	**25% = _____** (convert to decimal)	Calculate 25% of (D)		**(J)**

We hope you have enjoyed your meal. Ya'll come back now, you hear.

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Discounts

Example 1: Regularly $212.50 – 10% discount
To calculate the discount multiply $212.50 by 0.1 (the equivalent of 10%).
$212.50 • 0.1 = $21.25
The discount is $21.25. This is how much you SAVE off the original price.

Sale Prices

Example 2: Regularly $88.75 – 20% off sale
There are two ways to calculate the sale price.

1. Calculate the discount and subtract the discount from the original price.
   $88.75 • 0.2 = $17.75
   $88.75 - $17.75 = $71.00
   The sale price is $71.00

2. Multiply the price by the percentage of the price remaining. In this example, 80% of the original price is still left.
   $88.75 • 0.8 = $71.00

What is the sale price of a $62 sweater if it is:

1.	30% off	2.	25% off	3.	15% off	4.	80% off

What is your discount if your bill is $49.50 and you get a:

5.	10% discount	6.	30% discount	7.	4% discount	8.	50% discount

Find the amount of the discount and the sale price.

	Regular Price	**Savings**	**Discount**	**Sale Price**
9./10.	$1,200	12%		
11./12.	$70	30%		
13./14.	$120	15%		
15./16.	$16.50	50%		
17./18.	$60	40%		
19./20.	$160	25%		
21./22.	$85	100%		
23./24.	$124	0%		
25./26.	$90	40%		
27./28.	$125	20%		
29./30.	$500	15%		

Activity 6-68: **Sales and Discounts** Name:

Bargain Becky loves to get a good deal and won't buy anything unless it's on sale. She decided to go to Mangham's Maniac Munchies where everything is on sale!

*** *Mangham's Maniac Munchies* ***					
Chicken, 10 lbs.	$26.50	40% off	Turkey, 15 lbs.	$32.40	20% off
Pork, 8 lbs.	$24.00	25% off	Ice Cream, 6 cartons	$18.50	10% off
Hamburger, 12 lbs.	$28.60	15% off	Beans, 50 lbs.	$30.00	12% off
Potatoes, 20 lbs.	$7.20	35% off	Pecan Pie, 6	$31.90	50% off
Shrimp, 4 lbs.	$27.40	30% off	Hot Dogs, 100	$12.00	8% off
Lobsters, 4 live	$34.00	45% off	Rice, 50 lbs.	$28.20	5% off

Use the table above to answer the following questions.

1.	What is the discount on 12 lbs. of hamburger?	2.	What is the discount on 100 lbs. of beans?
3.	What is the sale price for 20 lbs. of potatoes?	4.	What is the sale price for 150 lbs. of rice?
5.	What is the sale price for 4 lbs. of shrimp?	6.	What is the sale price for 75 lbs. of turkey?
7.	What is the discount on 8 lbs. of pork?	8.	What is the discount on 30 cartons of ice cream?
9.	What is the discount on 4 live lobsters?	10.	What is the sale price of 800 hot dogs?
11	What is the sale price for 20 lbs. of chicken?	12.	What is the discount on 24 pecan pies?

Find the amount of the discount and the sale price.

	Regular Price	**Savings**	**Discount**	**Sale Price**
13./14.	$52	25%		
15./16.	$80	20%		
17./18.	$36.50	40%		
19./20.	$17.80	10%		
21./22.	$250	18%		

23. Jodie wants to buy a shirt regularly priced at $20. The shirt goes on sale for 15% off the regular price. Which equation can be used to determine *s*, the sale price of the shirt, not including tax?

A. $s = 20 - (20)(0.15)$
B. $s = 20 - (20 + 0.15)$
C. $s = 20(0.15)$
D. $s = 20 + 0.15$

Activity 6-69: **Percent Equations and Percent Lines** Name:

To model a percent problem you can write an equation or model the problem with a percent line.

Solving percent problems with equations.

What is 20% of 45?	15 is 30% of what?	What percent of 60 is 15?
$n = 0.20 \bullet 45$ $n = 9$	$15 = 0.3 \bullet n$ $\frac{15}{0.3} = \frac{0.3n}{0.3}$ $50 = n$	$\frac{n}{100} \bullet 60 = 15$ $n \bullet 60 = 1500$ $\frac{60n}{60} = \frac{1500}{60}$ $n = 25\%$

Solving percent problems with percent lines.

What is 20% of 45?	15 is 30% of what?	What percent of 60 is 15?
0 — n — 45 0 — 20 — 100 $\frac{n}{20} = \frac{45}{100}$ $100n = 900$ $\frac{100n}{100} = \frac{900}{100}$ $n = 9$	0 — 15 — n 0 — 30 — 100 $\frac{15}{30} = \frac{n}{100}$ $30n = 1500$ $\frac{30n}{30} = \frac{1500}{30}$ $n = 50$	0 — 15 — 60 0 — $n\%$ — 100 $\frac{15}{n} = \frac{60}{100}$ $60n = 1500$ $\frac{60n}{60} = \frac{1500}{60}$ $n = 25\%$

Use either an equation or a percent line to model each problem. Do not solve.

1.	What is 10% of 55?		2.	12 is 20% of what?	
3.	What percent of 40 is 25?		4.	60 is 30% of what?	
5.	What is 90% of 400?		6.	What percent of 16 is 12?	
7.	What is 75% of 68?		8.	What percent of 100 is 38?	
9.	40 is 10% of what?		10.	What is 25% of 700?	
11.	1 is what percent of 3?		12.	What percent of 240 is 30?	

Solve each problem. Use either an equation or a percent line.

13.	What is 30% of 50?		14.	6 is 50% of what?	
15.	What percent of 18 is 12?		16.	30 is 20% of what?	
17.	What percent of 100 is 45?		18.	What is 80% of 200?	
19.	What is 75% of 88?		20.	16 is 40% of what?	
21.	What percent of 50 is 32?		22.	What percent of 9 is 12?	
23.	If 3 is 5% of a number, what is 30% of that number? Explain how you solved the problem after showing all of your work.				

Activity 6-70: **Percent Equations and Percent Lines** Name:

Solve each problem. Use either an equation or a percent line.

1.	40% of what number is 36?	2.	12 is 6% of what number?
3.	5% of what number is 2?	4.	8 is 20% of what number?
5.	77 is 77% of what number?	6.	80% of what number is 520?
7.	12% of what number is 3?	8.	21 is 5% of what number?
9.	Find 12.5% of 72.	10.	30% of what amount is $2,400?
11.	$15 is what percent of $240?	12.	What percent of 120 is 48?
13.	Find 106% of 55.	14.	$4 is what percent of $50?
15.	What percent of 1,000 is 2?	16.	What is 2.3% of 610?
17.	91 is 140% of what number?	18.	What percent of 200 is 400?
19.	How much sales tax, at a rate of 5.5%, is due on the sale of a $8,696 car?		
20.	A pop quiz was passed by 24 out of 28 students. What percent passed? (nearest percent)		

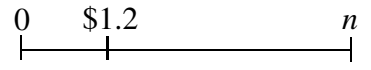
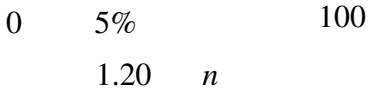
Solve each problem. Use either an equation or a percent line.

21.	What number is 12% of 6?	22.	6 is what percent of 12?
23.	6 is 12% of what number?	24.	Find 62.5% of 32.
25.	What is 35% of 84?	26.	9 is 2% of what number?
27.	16 is what percent of 5?	28.	What percent of 45 is 18?
29.	21 is what percent of 12?	30.	What percent of 60 is 42?
31.	150 is what percent of 60?	32.	20 is what percent of 50?
33.	What is 8% of 17.5?	34.	What is 37.5% of 300?
35.	Find 87.5% of 100.	36.	Find 6.5% of 250.
37.	39 is 40% of what number?	38.	56 is 1% of what number?
39.	What number is 19% of $100?	40.	125% of what number is 15?
41.	40% of $9 is what number?	42.	2 is what percent of 125?

43.	In a Dallas Morning News article it stated: “Online retailers may list prices up to 200 percent lower than college bookstores.” Is this possible? How?	

Example **Jimmy bought 2 CD's at Best Buy. He lost the sales slip, but he knew the tax was $1.20. The tax rate in his state is 5%. What was the cost of his items before tax was added?**

Solve with an equation. **Solve with a percent line.**

\$1.20 is 5% of the cost	\$1.20 is 5% of the cost
$1.20 = 0.05 \bullet n$ $\frac{1.20}{0.05} = \frac{0.05n}{0.05}$ $\$24.00 = n$	  $\frac{1.20}{5} = \frac{n}{100}$ $5n = 120$ $\frac{5n}{5} = \frac{120}{5}$ $n = \$24.00$

Use an equation or a percent line to solve each problem.

1.	A poll was taken in a town with a population of 15,000. The poll asked for an opinion of the city council's performance for the past year. The number of people who thought that the council has done well was 9,500. What percent of the population voted favorably?
2.	Twenty percent of the students in a class have one or more cats as pets. There are six cat owners in the class. How many students are in this class?
3.	Elise earns \$45/week with a part-time job at a local pig farm. She decides to put 30% of this amount in a saving account. How much does she put in the savings account each week?
4.	Caroline conducted a survey of several students in her school. She asked 150 students to name their favorite food. Ninety students named pizza as their favorite food. What percent of students preferred pizza?
5.	Teri's salary increased from \$4.50/hour to \$4.95/hour . His new salary is what percent of his old salary?
6.	Twenty-five of the numbers from 1 to 100 are prime. What percent of these 100 integers are prime?

Solve each problem. Use either an equation or a percent line.

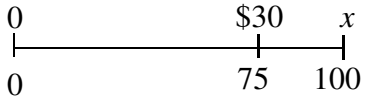
7.	3,000 is what percent of 75,000?	8.	2% of 6,250 is what number?
9.	1% of what number is 68?	10.	98 is 5% of what number?
11.	10% of what number is 62?	12.	160 is what percent of 800?
13.	What number is 25% of 21.6?	14.	40% of 375 is what number?
15.	800 is what percent of 320?	16.	125% of 72 is what number?

Activity 6-72: **Sales and Discounts Revisited** Name:

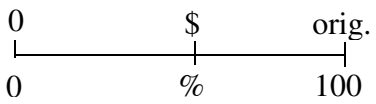
All sales and discounts can be calculated by creating either an equation or a percent line. The trickiest one is when the percent savings and the new price are given to you. See the example below:

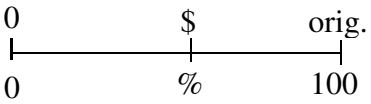
Example: Tara bought a new coat which was on sale for $30, which was 25% off the original price. What was the original price?

Since the $30 is how much she paid, it is equivalent to 75% of the original price (because she saved 25%). Therefore, the equation would be: $.75 \bullet x = \$30$. A percent line would be setup as:



Your percent line will always be set up in one of two ways:





Complete the table below. Find the missing numbers by using either an equation or a percent line.

	Today's deal	Original Price	New Price	Savings
1/2.	70% off	$85.00		
3/4.	65% savings			$19.50
5/6.		$120.00	$72.00	
7/8.		$45.00		$11.25
9/10.			$28.00	$22.00
11/12.	15% discount		$34.00	
13/14.	30% off	$92.00		
15/16.	20% discount		$105.00	
17/18.	75% savings			$1.80
19/20.		$23.70	$18.96	
21/22.		$60.00		$25.20
23/24.	90% off		$60.00	

25.	A television set that regularly costs $250 is advertised on sale at a 15% discount. A week later it is further reduced by 10% of the discounted price. Find a single discount that is equivalent to these two successive discounts.	

Activity 6-73: **Percent Word Problems** Name:

Solve. Use either a percent equation or a percent line.

1.	The "I Love American Idol" club has 60 members. Twenty-four of the members are younger than 12. What percent of the members are younger than 12?
2.	In Grapevine, 75% of the parks have tennis courts. If 18 parks have tennis courts, how many parks does Grapevine have altogether?
3.	There are 275 sixth graders at DIS. A survey shows that 64% of them think Mrs. Atkins is weird. How many DIS sixth graders think Mrs. Atkins is weird?
4.	In the Dragon Apartments 35% of the apartments have one bedroom. If there are 63 one bedroom apartments, what is the total number of Dragon Apartments?
5.	Vijay received a score of 96% on his math test. If he correctly answered 24 problems, how many questions were on the test?
6.	Your dinner last night contained 6 grams of fat, which is 8% of the daily value recommended by the U.S. Food and Drug Administration. How many grams of fat are recommended for a normal diet?
7.	Your dinner last night contained 500 mg of potassium, which is 14% of the daily value recommended by the U.S. Food and Drug Administration. How many milligrams of potassium are recommended for a normal diet? (nearest tenth)
8.	Landon wants to buy a new baseball cap. He finds one that normally sells for $17.99 on sale for 20% off. Find the discount to the nearest cent.
9.	Chris wants to buy an IPod Nano. The original price was $79 and it is on sale for 10% off. Chris has an additional coupon for 25% off the purchase of any sale item at the store. What is the price of the IPod after both discounts are applied (to the nearest cent)?

BEST BUY	**GAMESTOP**
20% off games $30 or less 30% off games over $30 We accept all manufacturer's coupons providing an additional 25% off	50% off all games No coupons allowed

Mr. Mangham wants to buy three games: $19.99, $54.99, and $35.99.

Solve. Show all work on a separate sheet of paper.

10.	Make a prediction as to which store you think was offering the best deal. Explain your prediction.
11.	Solve with a percent line or an equation to determine how much each of the three games will cost at each store. Which store offers the better deal?
12.	While shopping at Walmart, Mr. Mangham found another game for a sale price of $23.99 which had been discounted 25%. What was the original price of the game?

Activity 6-74: **Exercise and Calories** Name:

$$C = \left(\frac{13}{8}w - \frac{5}{4}\right)d$$

The equation above is used to tell how many calories per mile a person burns while running.

C = the total number of calories burned
w = weight of the person in kilograms
d = number of miles run

1 kilogram ≈ 2.205 pounds

1.	Mr. Mangham weighs about 175 pounds. He wants to go for his daily run of 6 miles. How many calories will he burn?	
2.	Mr. Mangham just completed a marathon! That is 26.2 miles. How many calories did he burn?	
3.	Sam weighs 74 kilograms. How many calories per mile will he burn running?	
4.	Tyler weighs 50 kilograms. How many calories will he burn in a 5 mile run?	
5.	Emily weighs 52 kilograms. She burned 572 calories in her run yesterday according to her runners' watch. How far did she run?	
6.	Unice weighs 58 kilograms. How many calories per mile will she burn running?	
7.	Terrance weighs 60 kilograms. How many calories would he burn in a 3 mile run?	
8.	Natasha weighs 58 kilograms. She burned 810 calories in her run yesterday. How far did she run?	
9.	Chris ran $9\frac{1}{3}$ miles. Mr. Mangham calculated that he burned 1050 calories. How much does Chris weigh?	

Original Price	**Today's deal (% saved)**	**Savings ($ saved)**	**Percent Spent**	**New Price ($ spent)**
$120.00	15% off original price			
	35% discount			$45.50
	80% discount	$40.00		
$800.00				$100.00

Activity 6-75: **Percent of Change and Markup** Name:

$$Percent\ Change = \frac{Change}{Original} \times 100$$

$$\text{Percent Increase} = \frac{\text{New Price} - \text{Old Price}}{\text{Old Price}} \times 100$$

$$\text{Percent Decrease} = \frac{\text{Old Price} - \text{New Price}}{\text{Old Price}} \times 100$$

Example On the first Monday of school, eight students in Mr. Mangham's homeroom thought math homework was important. After doing homework and getting excellent grades on their first test, 20 of the students now thought math homework was important. Find the percent increase.

$$\text{percent of change} = \frac{20-8}{8} = \frac{12}{8}$$
$$= 1.5 \text{ or } 150\%$$

Find each percent of change. Describe the percent of change as a percent of increase or a percent of decrease. If necessary, round to the nearest tenth of a percent.

1.	\$20 to \$25		2.	5 ft. to 4 ft.	
3.	20 mi/hr to 35 mi/hr		4.	12 cm to 6 cm	
5.	\$2.50 to \$7.50		6.	120 lb to 132 lb	
7.	\$96 to \$147		8.	144 lb to 168 lb	
9.	18.5 ft to 22.2 ft		10.	\$48 to \$42	
11.	\$4 to \$4.44		12.	20 students to 30 students	
13.	\$400 to \$380		14.	\$65 to \$50	
15.	\$140 to \$100		16.	From 16 bagels to 0 bagels	

The grizzly bear population in Yellowstone National Park in 1970 was about 270. Over the next 35 years, it increased by about 115%. What was the population in 2005?

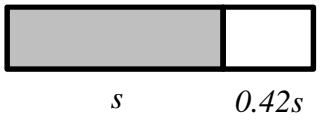
Step 1: Find the amount of change.
Step 2: Find the new amount by adding the amount of change to the original amount.

A TV has an original price of \$499. Find the new price after a 10% increase.
A TV has an original price of \$499. Find the new price after a 30% decrease.
There were originally 48 cookies. If the next day there was a 25% decrease in cookies, how many cookies were there the next day?
Mr. Mangham had 810 songs on his iPod last year. This year there is a 130% increase in songs on his iPod. How many songs does he have this year?
Adam currently runs about 20 miles a week and he wants to increase his weekly mileage by 30%. How many miles will Adam run per week?
Cheese sticks that were previously priced at "5 for \$1" are now "4 for \$1". Find the percent decrease in the number of cheese sticks you can buy for \$1. Find the percent increase in price per cheese stick.

Markup is an amount added to the original cost of an item to find the selling price.

To make a profit, stores mark up the prices on the items they sell. A sports store buys skateboards from a supplier for s dollars. What is the retail price for skateboards that the manager buys for $35 and $56 after a 42% markup?

Use a bar model. Draw a bar for the cost of the skateboard s. Then draw a bar that shows the markup: 42% of s , or $0.42s$.

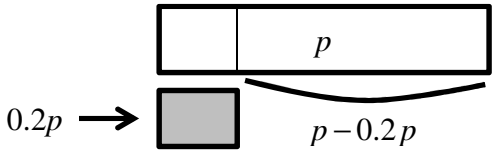


Retail price = Original cost + Markup = $s + 0.42s = 1.42s$

$s = \$35 \longrightarrow$ Retail Price = 1.42($35) = $49.70
$s = \$56 \longrightarrow$ Retail Price = 1.42($56) = $79.52

An example of a percent decrease is a discount, or **markdown.** A price after a markdown may be called a sale price. You can also use a bar model to represent the price of an item including the markdown.

A discount store marks down all of its holiday merchandise by 20% off the regular selling price. Find the discounted price of decorations that regularly sell for $16 and $23.



Markdown price = Original cost − Markdown = $p + 0.2p = 0.8p$

$p = \$16 \longrightarrow$ Markdown Price = 0.8($16) = $12.80
$p = \$23 \longrightarrow$ Markdown Price = 0.8($23) = $18.40

Dana buys dress shirts from a clothing manufacturer for s dollars each and then sells the dress shirts in her retail clothing store at a 35% markup.

a. Write the markup as a decimal
b. Write an expression for the retail price of the dress shirt.
c. What is the retail price of a dress shirt hat Dana purchased for $32.00?
d. How much was added to the original price of the dress shirt?

Activity 6-77: **Markup & Markdown** Name:

List the markup and retail price of each item. Round to two decimal places when necessary.

	Item	Price	Markup %	Markup	Retail Price
	Hat	$18	15%		
	Book	$22.50	42%		
	Shirt	$33.75	75%		
	Shoes	$74.99	33%		
	Clock	$48.60	100%		
	Painting	$185.00	125%		

Find the selling price for each item given the amount paid and the markup or markdown.
Round to the nearest cent.

17.	$240 grill, 25% markup		18.	$580 refrigerator, 30% markup	
19.	$160 microwave, 20% markup		20.	$150 chair, 35% markup	
21.	$59.99 shoes, 15% markup		22.	$99.99 watch, 20% markup	
23.	$45.00; 22% markdown		24.	$279.99; 75% markdown	
23.	Find the percent change in price if the old selling price was $20 and the new selling price is $15.				
24.	Find the percent change in price if the old selling price was $13 and the new selling price is $15.				
25.	A storekeeper pays $80 for a coat and prices it at a markup of 15%. Later it is marked up an additional 10% of that price. Find a single markup equivalent to these two successive markups.				

Mrs. Oliver made price tags for several items that are to be marked down by 35%. Match each Regular Price to the correct Sale Price, if possible. Not all sales tags match an item.

Regular Price $3.29	Regular Price $4.19	Regular Price $2.79	Regular Price $3.09	Regular Price $3.77
Sale Price $2.01	Sale Price $2.45	Sale Price $1.15	Sale Price $2.72	Sale Price $2.24