6-5-18

Aim: SWBAT review.

HW: Review Quiz #2 this week

Final Exam Tuesday June 12th

Textbooks can start being returned

Do Now: Review Packet and Calculator

Percent Proportion

$$\frac{is}{of} = \frac{r}{100} \quad \text{or} \quad \frac{part}{whole} = \frac{r}{100}$$

Percent Increase or Decrease

$$\frac{\text{amount of increase/decrease}}{\text{original amount}} = \frac{r}{100}$$

Percent Error

$$\frac{\text{amount of error}}{\text{actual amount}} = \frac{r}{100}$$

Simple Interest: Interest = Principal x Rate x Time (I=PRT)

- I = Interest, The ($) amount of interest that is owed or earned.
- P = Principal, the amount of money that was borrow, saved or invested.
- R = Rate, the percent of interest. ***Make sure to convert your % to a decimal**
- T = Time, time is **always** in **years**.

$\frac{F}{D} \times 100 = \%$ $\quad \% \div 100 = \frac{F}{D}$

Complete the chart:

Fraction/Mixed Number	Percent	Decimal
25) $\frac{47}{200}$	26) 23.5%	.235
$\frac{5}{6}$	27) $83.\overline{3}\%$ OR $83\frac{1}{3}\%$	28) $0.8\overline{3}$
$1\frac{1}{5}$	29) 120%	30) 1.2
31) $\frac{3}{20}$	15%	32) 0.15
33) $\frac{3}{50}$	6%	34) 0.06
35) $\frac{28}{25}$ OR $1\frac{3}{25}$	36) 112%	1.12

37) Find 12% of 95?

$\frac{p}{95} = \frac{12}{100}$

$\frac{1140}{100} = \frac{100p}{100}$

11.4 = p

38) 15 is 60% of what number?

$\frac{15}{b} = \frac{60}{100}$

$\frac{1500}{60} = \frac{60b}{60}$

25 = b

39) 23 is what percent of 115?

$\frac{23}{115} = \frac{r}{100}$

$\frac{115r}{115} = \frac{2300}{115}$

→ r = 20

Rate → R = 20%

Solve Algebraically. One way to solve each of the following word problems is using the percent proportion. There are quicker methods, but beware, they also require a higher level of understanding.

40) The cost of developing film is $5.49 per roll. There is also 6% sales tax charged. What would be the cost of developing 4 rolls of film?

Let n = sales tax per roll

$\frac{n}{5.49} = \frac{6}{100}$ $\frac{32.94}{100} = \frac{100n}{100}$ $0.3294 = n$

5.49 + 0.33 = $5.82 per roll

5.82 • 4 = 23.28

$23.28

41) Mary sold $192 worth of greeting cards. If she received 25% commission on her sales, how much commission did she earn?

Let n = amount of commission

$\frac{n}{192} = \frac{25}{100}$ $\frac{4800}{100} = \frac{100n}{100}$ $48 = n$

Mary earned $48 commission.

42) Jenny bought a pair of boots priced at $85. If the boots were on sale for 15% off the regular price, how much did Jenny pay for the boots?

Let n = amount of discount

$\frac{n}{85} = \frac{15}{100}$ $\frac{1275}{100} = \frac{100n}{100}$ $12.75 = n$

discount = $12.75

Sale Price = 85 - 12.75 = 72.25

Jenny paid $72.25 for the boots.

43) The regular price of a bicycle is $99.50. If sales tax is 7.5%, how much is the bicycle including sales tax?

Let n = amount of tax

$\frac{n}{99.50} = \frac{7.5}{100}$ $\frac{746.25}{100} = \frac{100n}{100}$ $7.4625 = n$

tax = $7.46

Total = 99.50 + 7.46 = 106.96

The bicycle costs $106.96.

44) There are 350 people at a luncheon. If 12% of the people will win a door prize, how many door people will win a door prize?

Let n = # of people who win a door prize

$\frac{n}{350} = \frac{12}{100}$ $\frac{4200}{100} = \frac{100n}{100}$ $42 = n$

42 people will win a door prize.

45) If Robert got 42 questions correct out of 60 questions on a test, what percent of the questions on the test did Robert get correct?

Let R = % of question correct

$\frac{42}{60} = \frac{r}{100}$ $\frac{60r}{60} = \frac{4200}{60}$ $r = 70, R = 70\%$

Robert got 70% of the questions correct.

46) If the original price of a sweater was $75.99. The sweater is now on sale for $62.50, what was the percent decrease in the price of the sweater? (Round to the nearest 0.1%)

Let R = % of decrease in price

$\frac{13.49}{75.99} = \frac{r}{100}$ $\frac{75.99r}{75.99} = \frac{1349}{75.99}$ $r = 17.7523...$ $R \approx 17.8\%$

It was a 17.8% decrease in price.

47) Jen's bill at a restaurant before tax and tip is $22. If tax is 5.25% and she wants to leave 15% of the bill including the tax for a tip, how much will she spend in total?

Let n = amount of tax

$\frac{n}{22} = \frac{5.25}{100}$

tax = $1.16

bill = 22+1.16 = 23.16

1.155 = n

Let n = amount of tip

$\frac{n}{23.16} = \frac{15}{100}$

tip = $3.47

Total = 23.16+3.47

= $26.63

3.474 = n

48) A $300 mountain bike is discounted by 30%, and there is a 8% sales tax. Find the final cost of the mountain bike.

Find the discount first:

Let n = amount of discount

$\frac{n}{300} = \frac{30}{100}$

90 = n

The discount is $90

$300 - $90 = $210

Now find the sales tax on the discounted price:

Let n = amount of tax

$\frac{n}{210} = \frac{8}{100}$

16.8 = n

The tax is $16.80.

$210 + $16.80

= $226.80

49) Evie borrows $4000 at 6% interest for 3 years. How much interest will she owe? What is the total amount of money Evie will need to repay her loan?

I = I

P = $4,000

R = 6% → 0.06

T = 3 years

I = PRT

I = 4,000 (0.06) (3)

I = 720

Interest = $720

Total

$4000 + $720 = $4720

Evie will owe $720 interest.

50) What principal would you have to invest at 4.5% for 8 months to earn $165 in interest?

I = $165

P = P

R = 4.5% → 0.045

T = 8 months → $\frac{2}{3}$ years

I = PRT

$165 = P \cdot 0.045 \cdot \frac{2}{3}$

$\frac{165}{0.03} = \frac{0.03P}{0.03}$

5500 = P

You would have to invest $5500.

51) You measure the length of the room to be 12.5ft. The actual length is 11.75ft. Find the percent error to the nearest tenth.

Let R = % error

Amount of error:

12.5 - 11.75 = 0.75

Actual: 11.75

$\frac{0.75}{11.75} = \frac{r}{100}$

$\frac{75}{11.75} = \frac{11.75r}{11.75}$

6.3829... = r

R ≈ 6.4%

The percent error is about 6.4%.

Unit 4: Statistical Analysis & Probability

Probability is the study of chance. What is the "chance" that something is going to happen. You have 3 options:

1) It will **ALWAYS** happen so the **probability is 1**.
2) It **MIGHT** happen so the **probability will be less than 1 but greater than 0**.
3) It will **NEVER** happen so the **probability is 0.**

Probability is a ratio, a comparison of 2 numbers. $\frac{\text{NUMBER OF POSSIBLE OUTCOMES}}{\text{NUMBER OF TOTAL OUTCOMES}}$

First you have to find the total number of outcomes, than you make your comparisons.

Example: You have 5 blue pens, 7 black pens, 3 red pens, and 1 green pen.
(Before you can answer any probability questions using the above info, you need to find the total number of pens!!)
5 + 7 + 3 + 1 = 16 pens

A) P(black) means "What is the probability the pen you choose will be black?"

There are 7 black pens out of a total of 16 pens. The probability is $\frac{7}{16}$. Before you finalize your answer make sure it is simplest form. Remember your calculator will simplify for you.

B) P(black or red) = $\frac{7}{16} + \frac{3}{16} = \frac{10}{16} = \mathbf{\frac{5}{8}}$ **Remember: OR → ADD (1 event)**

C) P(black and red) = $\frac{7}{16} \bullet \frac{3}{16} = \mathbf{\frac{21}{256}}$ **Remember: AND → MULTIPLY (2 or more events)**

There are 2 kinds of events: **Independent Events** and **Dependent Events**.

Independent Events - 1 event **DOES NOT** affect the 2nd event

Dependent Events – 1 event **DOES** affect the 2nd event

EXAMPLES:

D) P(red and green) **with replacement** = $\frac{3}{16} \bullet \frac{1}{16} = \mathbf{\frac{3}{256}}$ (Notice the **denominator** stayed the **same**)

E) P(red and green) **without replacement** = $\frac{3}{16} \bullet \frac{1}{15} = \mathbf{\frac{1}{80}}$ (Notice the **denominator changed**)

F) P(black and black) **with replacement** = $\frac{7}{16} \bullet \frac{7}{16} = \mathbf{\frac{49}{256}}$

G) P(black and black) **without replacement** = $\frac{7}{16} \bullet \frac{6}{15} = \mathbf{\frac{7}{40}}$

To find the total number of outcomes with more than one event you can multiply the outcomes of each event.
Example:

A) There are 4 different shorts (plaid, striped, and solid), 3 different shirts (white, blue, and black), and 2 different belts (brown and blue).

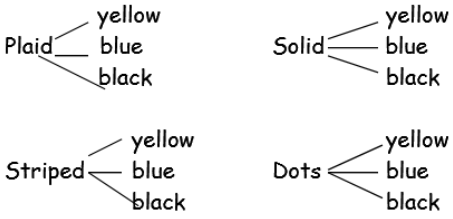
How many different outfits can you make? $4 \cdot 3 \cdot 2 = 24$ different outfits

B) You flip 3 coins. How many possible outcomes will there be?

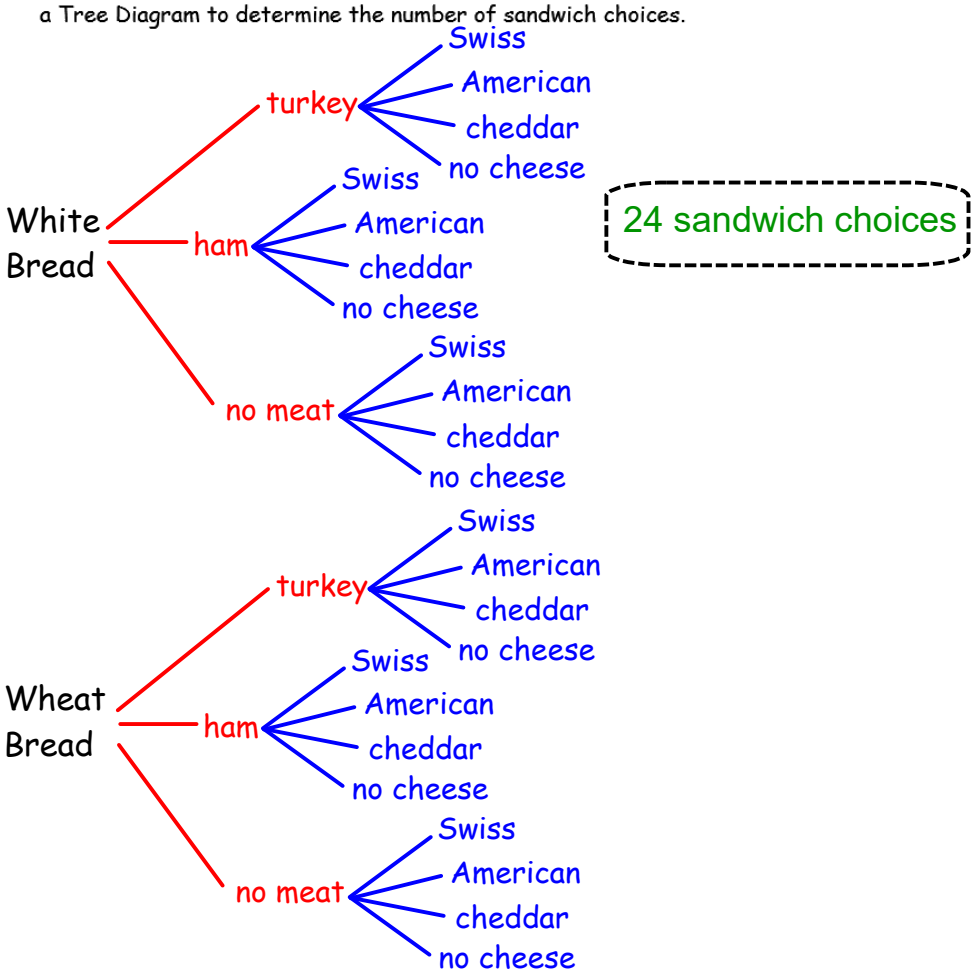
$2 \cdot 2 \cdot 2 = 8$ possible outcomes.

If you forget the Basic Counting Principle or if you want to SEE what your possible outcomes are, you could draw a **Tree Diagram**. Just remember when you use a **Tree Diagram** only possible outcomes can be in the diagram.

C) There are 4 different shorts (plaid, striped, solid, and dots), 3 different shirts (yellow, blue, and black). *There are 12 possible outfits.*



1) A sandwich shop offers a choice of white or wheat bread, three choices for meat (turkey, ham, or no meat), and four choices for cheese (Swiss, American, cheddar or no cheese). Use a Tree Diagram to determine the number of sandwich choices.



Use the Basic Counting Principal

2) Whitney has a choice of a floral, plaid, or striped blouse to wear with a choice of tan, black, navy, or white skirt. How many different outfits can she make?

$\frac{3}{\text{blouses}} \times \frac{4}{\text{skirts}} = 12$ **12 outfits**

3) You flip 3 coins. How many possible outcomes are there?

$\frac{2}{\text{coin \#1}} \times \frac{2}{\text{coin \#2}} \times \frac{2}{\text{coin \#3}} = 8$ **8 outcomes**

Use for #'s 4 – 13. A box contains 5 green pens, 3 blue pens, 8 black pens, and 4 red pens. A pen is picked at random.

Total = 20 pens

4) What is the probability the pen is green? $\frac{5}{20} = \frac{1}{4}$

5) P(blue or red) $\frac{7}{20}$ (3 + 4)

6) P(gold) $\frac{0}{20} = 0$ (impossible)

7) P(blue or gold) $\frac{3}{20}$ (3 + 0)

8) P(green, blue, black, or red) $\frac{20}{20} = 1$ (certain) (5 + 3 + 8 + 4)

9) P(blue **and** gold) 0 (impossible) $\frac{3}{20} \cdot \frac{0}{20}$

10) P(green and red) **with** replacement $\frac{5}{20} \cdot \frac{4}{20} = \frac{1}{20}$

11) P(green and red) without replacement $\frac{5}{20} \cdot \frac{4}{19} = \frac{1}{19}$

12) P(blue, black, and green) **without** replacement $\frac{3}{20} \cdot \frac{8}{19} \cdot \frac{5}{18} = \frac{1}{57}$

13) P(black and blue) **with** replacement $\frac{8}{20} \cdot \frac{3}{20} = \frac{3}{50}$

14) Find the MEAN, MEDIAN, MODE, and RANGE of the following set of data: Show all work

15, 12, 21, 18, 25, 11, 17, 19, 20

mean → $\frac{\text{sum of terms}}{\text{\# of terms}} \rightarrow \frac{158}{9} = 17.\overline{5}$

median → 11, 12, 15, 17, **18**, 19, 20, 21, 25

range → 25 - 11 = 14

mean = $17.\overline{5}$
median = 18
mode = none
range = 14

15) Find the MEAN, MEDIAN, MODE, and RANGE of the following set of data: Show all work

2, 3, 5, 4, 3, 6, 2, 7, 6, 3

mean → $\frac{41}{10} = 4.1$

median → 2, 2, 3, 3, 3, 4, 5, 6, 6, 7

range → 7 - 2 = 5

mean = 4.1
median = 3.5
mode = 3
range = 5

16) Use the information given to make a frequency table. Results of people's favorite movie:

comedy, action, comedy, romance, horror, comedy, comedy, romance, romance
romance, action, action, action, horror, comedy, foreign, action, action, romance, horror,
horror, action, comedy, foreign, action, comedy, romance, horror, comedy, romance,
horror, comedy, comedy, foreign

Type of Movie	Tally	Frequency
comedy	𝍸 𝍸	10
foreign	𝍸	3
action	𝍸 𝍸	8
romance	𝍸 𝍸	7
horror	𝍸 𝍸	6

Total = 34

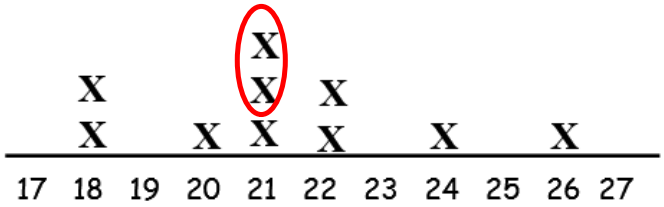
17) Using the table above, predict how many like comedy out of 500 people?_____

$\frac{10}{34} = \frac{n}{500}$ $\frac{5000}{34} = \frac{34n}{34}$

n = 147.0588...

About 147 people would like comedies.

Given the line plot chart about the heights of plants, answer questions 18 - 22.



median → 18, 18, 20, 21, 21, 21, 22, 22, 24, 26

18) What are the extremes of the data? 18 and 26 19) What is the median? 21

20) What is the mean? 21.3 21) What is the mode? 21 22) Range: 8

mean → $\frac{213}{10} = 21.3$

range → 26 - 18 = 8

23) Josh weighed each rock in his collection and recorded its weight in grams below.

15, 21, 22, 22, 23, 24, 27

A) What are the extremes of the data? 15 and 27

B) What is the median? 22

C) What is the lower quartile? 21

D) What is the upper quartile? 24

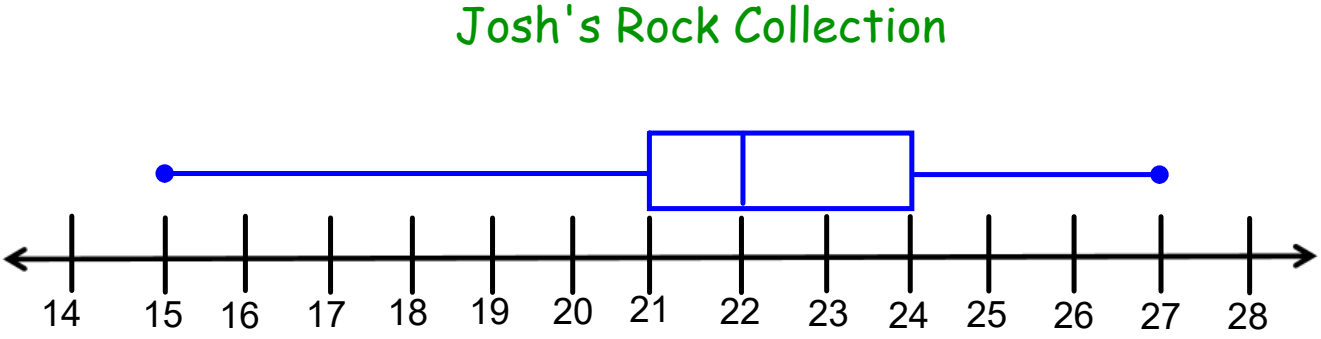
E) Interquartile Range (IQR): 3

24 - 21

F) Range: 12

27 - 15

G) Create a Box Plot for Josh's data. Remember your labels!!!!



24) Find the Mean Absolute Deviation (MAD) for question #23? (round to the nearest tenth)

$\text{mean} = \frac{154}{7} = 22$

$|22 - 15| = 7$
$|22 - 21| = 1$
$|22 - 22| = 0$
$|22 - 22| = 0$
$|22 - 23| = 1$
$|22 - 24| = 2$
$|22 - 27| = 5$

$\text{MAD} = \frac{16}{7} = 2.2857\ldots$

MAD ≈ 2.3