

6-7-17

Aim: SWBAT review for the final exam.

Do Now: Review Packet

HW: Final Exam Tuesday, June 13th

Textbook due on or before the final exam

- 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

$$\frac{n}{22} = \frac{5.25}{100} \quad \text{tax} = \$1.16$$

$$1.155 = n$$

$$\text{bill} = 22 + 1.16 = 23.16$$

Let  $n$  = amount of tip

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

$$3.474 = n$$

$$\text{tip} = \$3.47$$

$$\text{Total} = 23.16 + 3.47$$

$$= \$26.63$$

- 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?

$$I = I$$

$$P = \$4,000$$

$$R = 6\% \rightarrow 0.06$$

$$T = 3 \text{ years}$$

$$I = PRT$$

$$I = 4,000 (0.06) (3)$$

$$I = 720$$

$$\text{Interest} = \$720$$

$$\text{Total} = 4000 + 720 = \$4720$$

Evie will owe \$720 interest.

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

$$I = \$165$$

$$P = P$$

$$R = 4.5\% \rightarrow 0.045$$

$$T = 8 \text{ months} \rightarrow \frac{2}{3} \text{ years}$$

$$I = PRT$$

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

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

$$5500 = P$$

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

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

Amount of error:

$$12.5 - 11.75 = 0.75$$

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

Actual: 11.75

$$6.3829... = r$$

$$R \approx 6.4\%$$

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!!)

$$5 + 7 + 3 + 1 = 16 \text{ pens}$$

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.

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

$$C) P(\text{black and red}) = \frac{7}{16} \cdot \frac{3}{16} = \frac{21}{256} \quad \text{Remember: AND} \rightarrow \text{MULTIPLY} \quad (2 \text{ or more events})$$

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

**Independent Events** - 1 event **DOES NOT** affect the 2<sup>nd</sup> event

**Dependent Events** - 1 event **DOES** affect the 2<sup>nd</sup> event

**EXAMPLES:**

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

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

$$F) P(\text{black and black}) \text{ with replacement} = \frac{7}{16} \cdot \frac{7}{16} = \frac{49}{256}$$

$$G) P(\text{black and black}) \text{ without replacement} = \frac{7}{16} \cdot \frac{6}{15} = \frac{7}{40}$$

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).

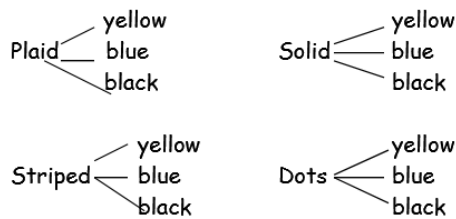
How many different outfits can you make?  $4 \cdot 3 \cdot 2 = 24$  different outfits

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

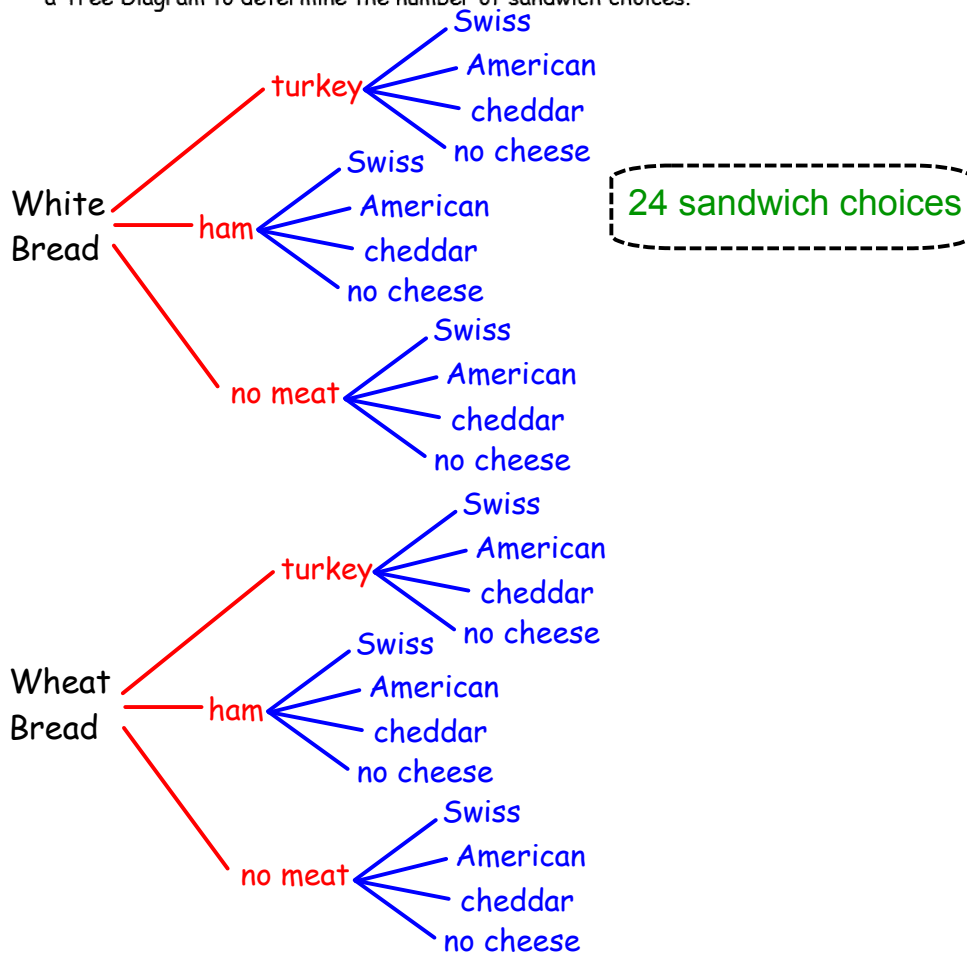
$2 \cdot 2 \cdot 2 = 8$  possible outcomes.

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?

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

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

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

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

$$\frac{5}{20} = \frac{1}{4}$$

- 4) What is the probability the pen is green?

$$\frac{5}{20} = \frac{1}{4}$$

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

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

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

$$3 + 4$$

$$\frac{20}{20} = 1 \text{ (certain)}$$

$$3 + 0$$

8) P(green, blue, black, or red)  $\frac{20}{20}$

9) P(blue and gold)  $0$  (impossible)

$$5 + 3 + 8 + 4$$

$$\frac{5}{20} \cdot \frac{4}{20} = \frac{1}{20}$$

$$\frac{3}{20} \cdot \frac{0}{20}$$

10) P(green and red) with replacement

$$\frac{5}{20} \cdot \frac{4}{20} = \frac{1}{20}$$

$$\frac{3}{20} \cdot \frac{0}{20}$$

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

median  $\rightarrow 11, 12, 15, 17, \boxed{18}, 19, 20, 21, 25$

range  $\rightarrow 25 - 11 = 14$

$$\begin{aligned} \text{mean} &= 17.\bar{5} \\ \text{median} &= 18 \\ \text{mode} &= \text{none} \\ \text{range} &= 14 \end{aligned}$$

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  $\rightarrow \frac{41}{10} = 4.1$

median  $\rightarrow 2, 2, 3, 3, \boxed{3, 4}, 5, 6, 6, 7$

range  $\rightarrow 7 - 2 = 5$

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		10
foreign		3
action		8
romance		7
horror		6

Total = 34

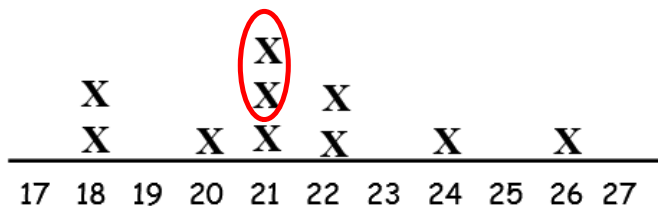
17) Using the table above, predict how many like comedy out of 500 people?

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

$n = 147.0588...$

About 147 people would like comedies.

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



median  $\rightarrow 18, 18, 20, 21, \boxed{21, 21}, 22, 22, 24, 26$

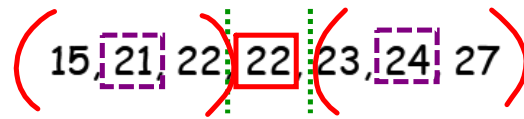
18) What are the extremes of the data? 18 and 26      19) What is the median? 21

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

mean  $\rightarrow \frac{213}{10} = 21.3$

range  $\rightarrow 26 - 18 = 8$

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



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

B) What is the median? <sup>50%</sup> 22

C) What is the lower quartile? <sup>25%</sup> 21

D) What is the upper quartile? <sup>75%</sup> 24

E) Interquartile Range (IQR): <sup>upper - lower quartile</sup> 3

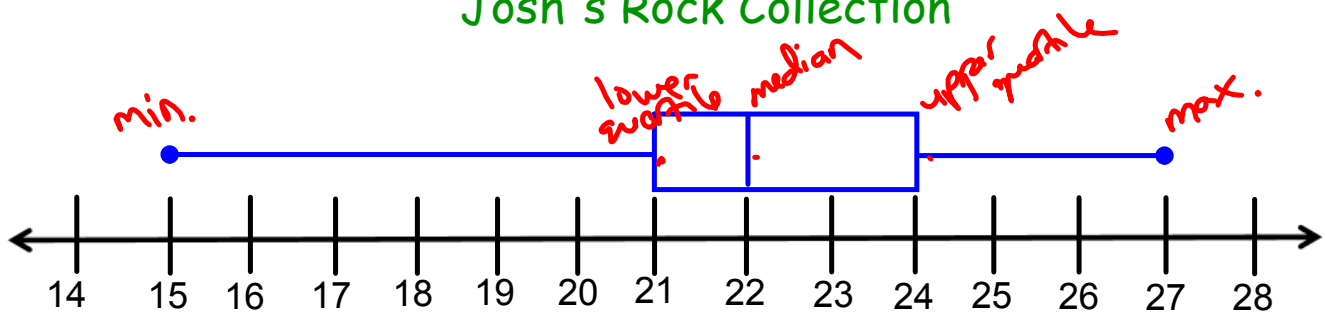
F) Range: 12

$$24 - 21$$

$$27 - 15$$

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

### Josh's Rock Collection



### # of grams

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

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

$$|22 - 15| = 7$$

$$|22 - 23| = 1$$

$$|22 - 21| = 1$$

$$|22 - 24| = 2$$

$$|22 - 22| = 0$$

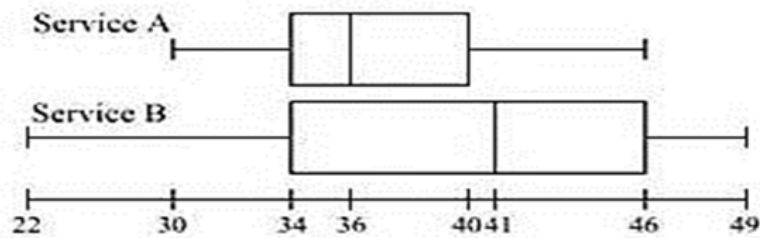
$$|22 - 27| = 5$$

$$|22 - 22| = 0$$

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

$$\text{MAD} \approx 2.3$$

The following box whiskers diagrams represents how many minutes it take a cleaning service to clean the same house. Answer questions 25 - 28 below based on the data from the diagram.



25) On average, what service appears to clean the house faster? A explain why?

It's median time is 5 minutes faster, it also has a lower range and IQR (inter-quartile range)

26) Which service would you say is more consistent? A explain why? It's median time is 5 minutes faster, it also has a lower range and IQR (inter-quartile range) so it's data are more clustered together.

27) What **percent** of the time did service B finish under 41 mins? 50%

28) What **percent** of the time did service A clean at least 34 mins? 75%

### Unit 5: Geometry

You should know the area formulas for 2-dimensional figures. (square, rectangle, rhombus, parallelogram, triangle and trapezoid)

**Circle:** Area:  $A = \pi r^2$  Circumference:  $C = \pi d$  or  $C = 2\pi r$  (d is diameter & r is radius)

- **Exact** means to leave your answer in terms of  $\pi$ .
- **Approximate** means use the  $\pi$  button on your calculator.

**Rectangular Prism:**  $SA = 2wl + 2lh + 2wh$

**Cube:**  $V = s^3$

**Rectangular Prism:**  $V = lwh$

**Triangular prism:**  $V = \left(\frac{1}{2}bh\right)h$

**Pyramid:**  $V = \frac{1}{3} Bh$ , where B is the area of the shape's base

**\*\* Remember your units!**

- Area and Surface area are units<sup>2</sup>
- Volume is units<sup>3</sup>

**\*\* Remember: ESTIMATE means to round the numbers FIRST, before you do any calculations!!!**