Name_____Date_____

ESP Graphs

Bar Graph of Group Members Percent Correct
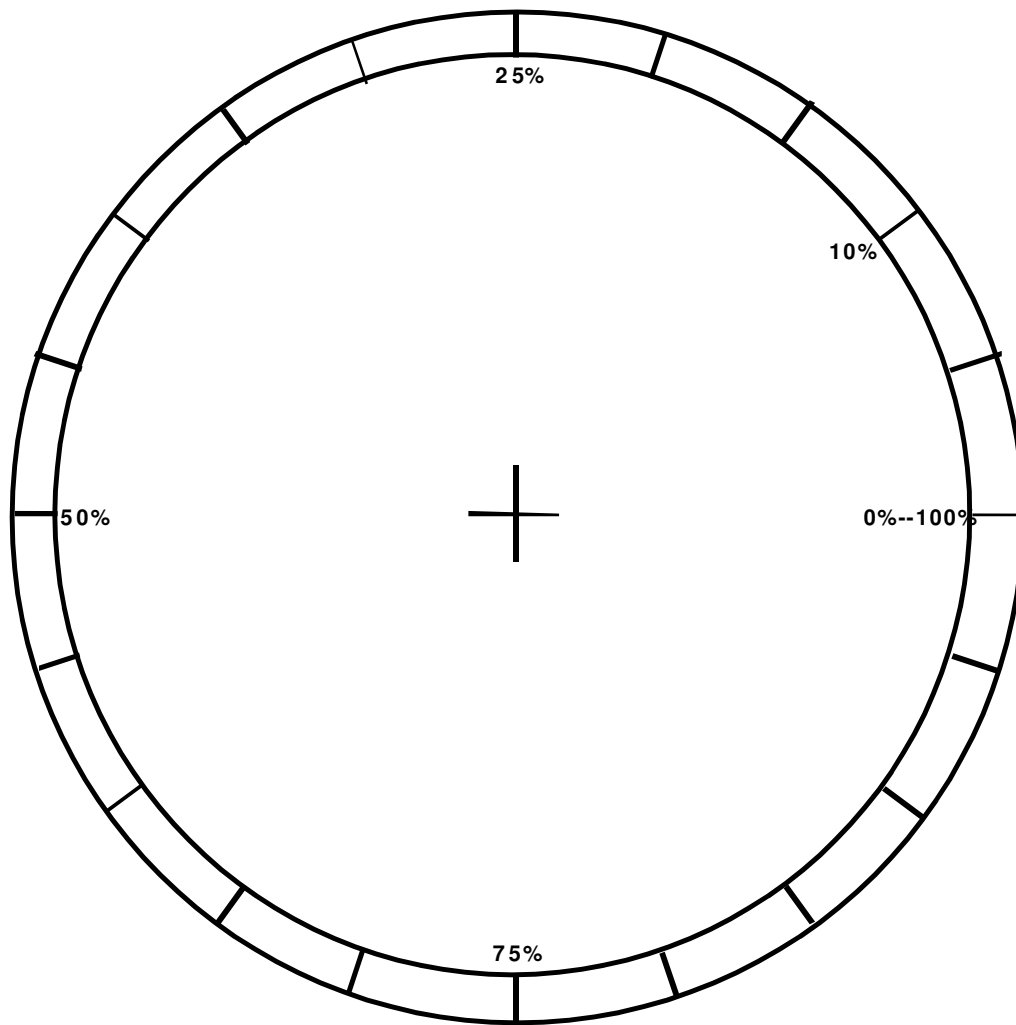
<div style="text-align:center;">Avg. Percent Correct</div>

Group Member
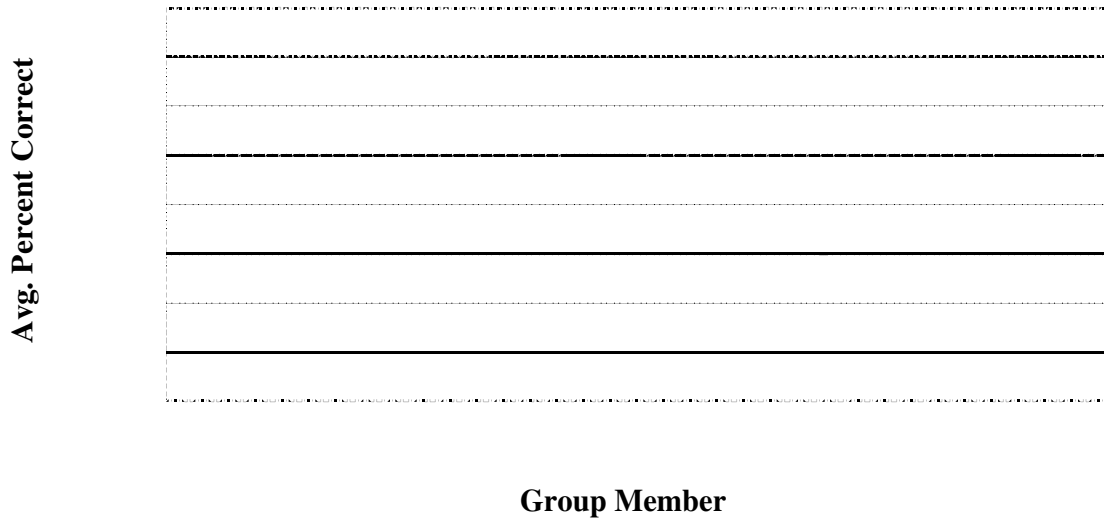
**Frequency Histogram of
Percent Correct on ESP Experiment**

Frequency

Percent Correct

Name_____Date_____

25%

10%

50%

0%--100%

75%
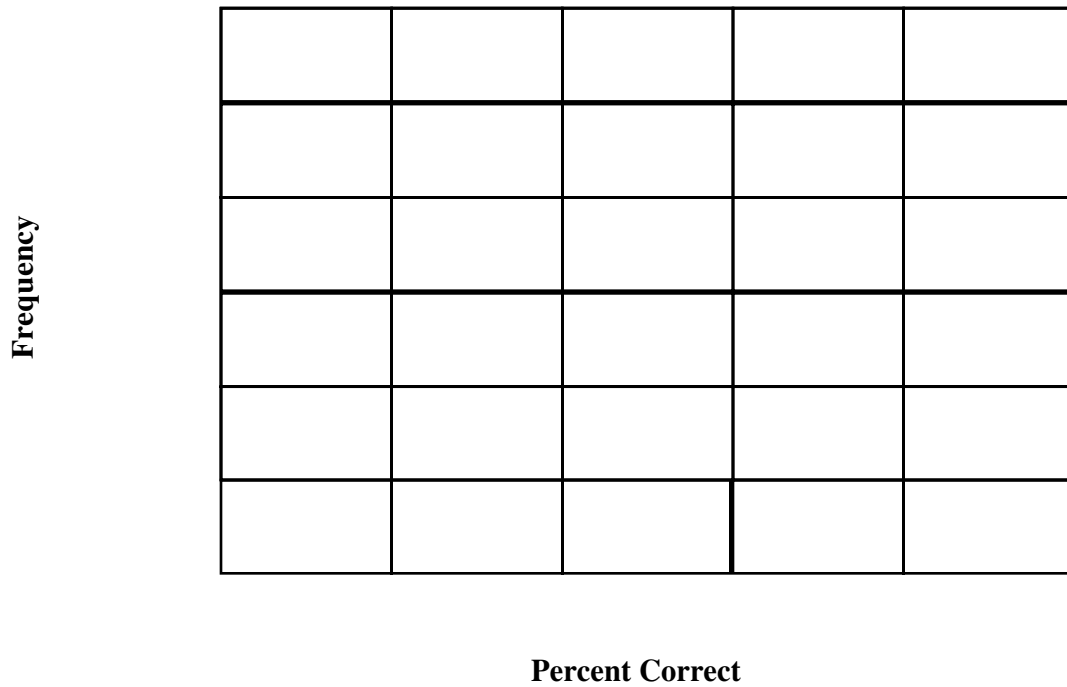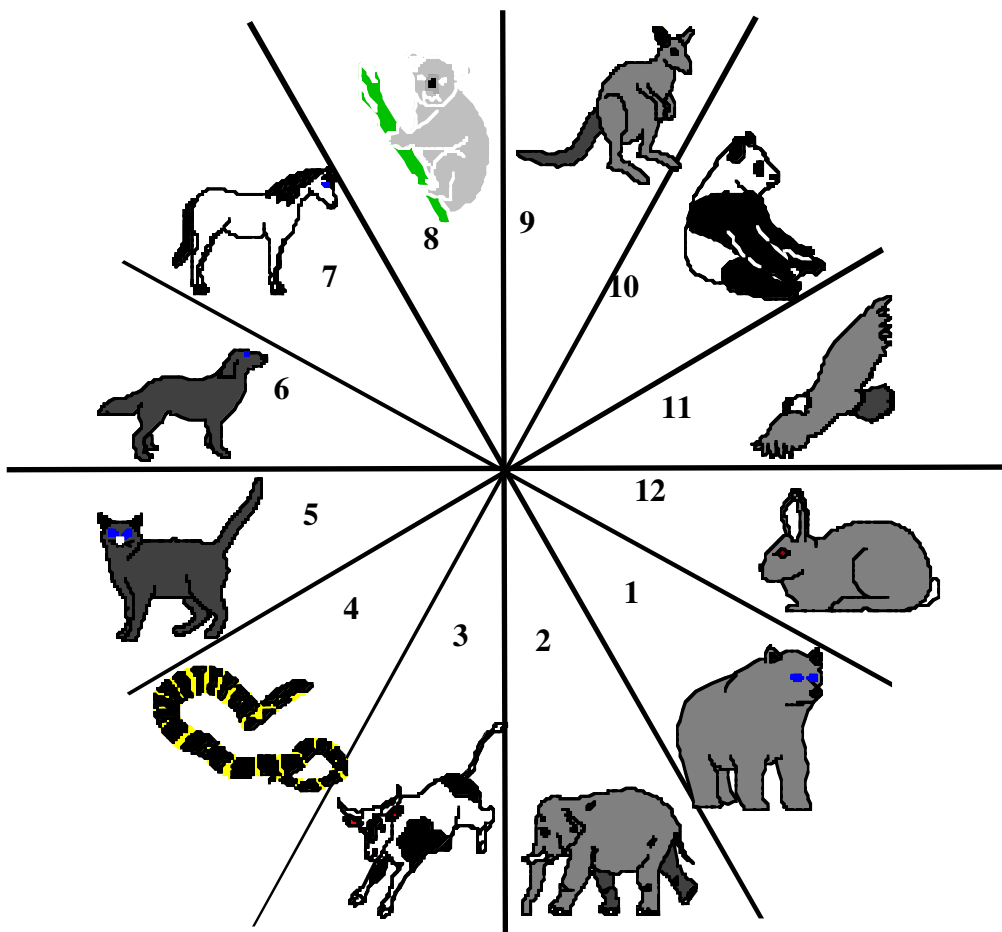
Beanie Babies

How many spins until you have a complete set of Beanie Babies?

1 Bear	_____
2 Elephant	_____
3 Calf	_____
4 Snake	_____
5 Cat	_____
6 Dog	_____
7 Horse	_____
8 Koala	_____
9 Kangaroo	_____
10 Panda	_____
11 Eagle	_____
12 Rabbit	_____

In a local restaurant, after each visit, you get a box with a Beanie Baby packed inside. The toys are packed randomly, so you never know which one you have until you open it. Simulate each visit to the restaurant by spinning the spinner. Place a tally mark by the animal you win on each spin. Stop when you have at least one of each type. Complete the experiment one or more times. Combine your results with those of the rest of the class and make a box plot.

What was the minimum number of visits to complete a set?
What was the maximum number of visits?
What was the median?
What is the interquartile range?   What does this mean in the context of this experiment?

Comparing Reaction Times

Equipment: 1 meter stick per group

Procedure: One member of the group holds the meter stick at the 100 cm end. Another member of the group places a hand at the bottom of the stick with thumb and forefinger each two-centimeters to the side of the 0 cm mark. When the person holding the top drops the stick, the other person, looking only at the bottom of the stick, catches the stick as quickly as possible by pressing thumb and forefinger together.

Data: After each catch, read the millimeter mark that is just visible above the thumb. Use this reading as an indication of the reaction time. Each group member will catch the meter stick three times.

Calculations: Determine the mean, median, and mode for your group. Calculate quartile 1 and quartile 3. Make a box and whisker plot for your group. Make the same calculations for the entire class. Compare the two box and whisker graphs.

Name	Reaction Time

Comparing Reaction Times

Group Data:

Mean _____   Median _____   Mode _____

Quartile 1 _____   Quartile 3 _____

Box and Whisker Plot

```
<-|————————————|————————————|————————————|————————————|————————————|—>
  0           10           20           30           40           50
```

Class Data:

Mean _____

Quartile 1_____   Median _____   Quartile 3 _____

Box and Whisker Plot

```
<-|————————————|————————————|————————————|————————————|————————————|—>
  0           10           20           30           40           50
```

Comparison of the two graphs.

The MODE of this set: 1, 1, 2, 2, 5, 1	The MEDIAN of this set: 1, 1, 2, 2, 5, 7	The MEAN of this set: 1, 1, 2, 2, 5, 7
The RANGE of this set: 1, 1, 2, 2, 5, 1	The MAXIMUM of this set: 1, 1, 2, 2, 5, 1	The MINIMUM of this set: 16, 25, 6, 12
The MODE of this set: 4, 5, 6, 7, 7, 10	The MEDIAN of this set: 10, 2, 8	The MEAN of this set: 6, 14, 7
The MEAN of this set: 3, 3, 3, 31	The MODE of this set: 12, 15, 11, 13, 11	The MEDIAN of this set: 8, 10, 14, 22
The RANGE of this set: 1, 1, 2, 14, 5, 1	The MEDIAN of this set: 8, 10, 14, 18, 22	The MEAN of this set: 22, 13, 10

The MEAN of this set: 30, 20, 8, 6	The MEDIAN of this set: 17, 25, 44, 10, 5	The MODE of this set: 22, 18, 46, 18
The RANGE of this set: 4, 11, 23, 6, 12	MAXIMUM of this set: 3, 3, 3, 7, 14, 20	The MEAN of this set: 22, 22, 30, 10
The MODE of this set: 2, 2, 22, 16, 22, 22	The MEDIAN of this set: 18, 18, 23, 25,27	The MEAN of this set: 40, 20, 30, 6
The MEAN of this set: 12, 8, 70, 10	The MODE of this set: 5,26, 5, 26, 26	The MEDIAN of this set: 15, 26, 28, 41
The RANGE of this set: 40, 55, 61, 68	The MEDIAN of this set: 16, 29, 42, 11, 50	The MEAN of this set: 25, 25, 40

The RANGE of this set: 37, 20, 8, 6	The MEDIAN of this set: 32, 53, 44, 10, 6	The MEAN of this set: 50, 30, 19
The MEAN of this set: 12, 12, 12, 100	MAXIMUM of this set: 12, 12, 12, 14, 35	The MEDIAN of this set: 12, 30, 42, 56
The MODE of this set: 37, 4, 100, 37	The MEDIAN of this set: 5, 38, 44, 59, 2	The MINIMUM of this set: 44, 44, 44, 39
The MEAN of this set: 100, 20, 20, 20	The RANGE of this set: 10, 16, 51, 24, 19	The MEDIAN of this set: 17, 19, 89, 45, 42
The RANGE of this set: 22, 56, 25, 65	The MEDIAN of this set: 41, 41, 47, 48	The MEAN of this set: 70, 30, 30, 50

The MINIMUM of this set: 50, 54, 46, 54	The MEDIAN of this set: 18, 100, 47	The MEAN of this set: 100, 100, 25, 10, 5
The MEAN of this set: 90, 8	MAXIMUM of this set: 3, 50, 7, 10, 20	The MEDIAN of this set: 14, 49, 53, 68
The MODE of this set: 50, 52, 52, 59	The MEDIAN of this set: 2, 4, 53, 68, 76	The MINIMUM of this set: 108, 92, 54, 66
The MEAN of this set: 10, 10, 20, 180	The RANGE of this set: 131, 100, 156, 122	The MEDIAN of this set: 60, 21, 89, 54
The RANGE of this set: 210, 244, 268	The MEDIAN of this set: 41, 55, 63, 78	The MAXIMUM of this set: 60, 30, 30, 50

The MINIMUM of this set: 124, 65, 156, 61	The MEDIAN of this set: 44, 42, 88, 80, 62	The MEAN of this set: 90, 50, 49
The MEAN of this set: 120, 8	MAXIMUM of this set: 64, 65, 7, 10, 20	The MEDIAN of this set: 56, 60, 72, 89
The MODE of this set: 65, 67, 69, 67	The MEDIAN of this set: 1, 2, 90, 99, 68	MINIMUM of this set: 94, 69, 89, 70
The MEAN of this set: 100, 100, 100, 40, 10	The RANGE of this set: 50, 99, 121, 82	The MEDIAN of this set: 1, 7, 72, 75, 75
The RANGE of this set: 300, 344, 373, 319	The MEDIAN of this set: 70, 70, 86, 74, 86	The MEAN of this set: 20, 80, 120, 80

Group Discussion Cards – Central Tendency

Summer Job

Hamburger restaurants are often competing to get good part-time help. One store has jobs paying the following hourly wages: $5.85, $6.00, $6.00, $6.25, $6.50, $6.75, $7.50 and $18.50.

Which method of central tendency is best to report this information? Does it make a difference if you are the restaurant manager or the potential employee as to which one best serves your purposes?

Calculate mean, median, and mode and discuss the advantages and disadvantages of each.

Bicycle Shop

A bicycle shop is trying to restock for the summer. It is your job to find out which bicycle tires should be ordered. You have the previous months' sales to help you decide.

Tire size	Number sold
18"	2
20"	5
24"	7
27"	12

Calculate mean, median, and mode and discuss the advantages and disadvantages of each.

Phone Bill

Your dad tells you you can have your own phone if you pay the bill. He shows you a list of the calls you made on his bill during the past months.

$12, $15, $16, $17, $17, $30, $52

Which method of central tendency is best to make a decision based on this information? Does it make a difference whether you are the dad or the son as to which one best serves your purposes?
Calculate mean, median, and mode and discuss the advantages and disadvantages of each.

Band Practice

You need a place for your band to practice. Your mom says you can use the garage if your band can pay for the electricity. You and the band discuss the amounts you have made from your performances in the previous months.

July: $100   August: $80
September: $0   October: $90
November: $0   December: $300
January: $150   February: $75
March: $0   April: $0

Calculate mean, median, and mode and discuss the advantages and disadvantages of each.

Name_____Date_____

PLAYER	TEAM	POS	G	AB	R	H	2B	3B	HR	RBI	TB	BB	SO	SB	CS	0BP	SLG	AVG
I. Suzuki	SEA	OF	161	704	101	262	24	5	8	60	320	49	63	36	11	.414	.455	.372
B. Bonds	SF	OF	147	373	129	135	27	3	45	101	303	232	41	6	1	.609	.812	.362
I. Rodriguez	DET	C	135	527	72	176	32	2	19	86	269	41	91	7	4	.383	.510	.334
J. Estrada	ATL	C	134	462	56	145	36	0	9	76	208	39	66	0	0	.378	.450	.314
H. Matsui	NYY	OF	162	584	109	174	34	2	31	108	305	88	103	3	0	.390	.522	.298

Definitions:
POS=Position played
G=Games played
AB=At bats
R=Runs scored
H=Hits
2B=Doubles
3B=Triples
HR=Homeruns
RBI=Runs batted in
TB=Total bases
BB=Bases on balls (Walks)
SO=Strikeouts
SB=Stolen bases
CS=Caught stealing
OBP=On-base Percentage (Divide the [total number of hits plus Bases on Balls plus hits by Pitch] BY [at Bats plus Bases on Balls plus hits by Pitch plus Sacrifice Flies].)
SLG=Slugging Percentage (Divide the total number of bases of all base hits by the total number of times at bat.)
AVG=Batting Average (Divide the number of base hits by the total number of at bats.)

Commercial Counting

During this project you will research television commercials. You will research how often they air, the types of products they advertise, and other trends in advertising. In addition, you may discuss how advertisers use them to influence you.

Form your group and complete the following items, as directed by your teacher.

Item 1: Frequency Tables

1. Decide the following with your group:

    a. Which six half-hour time slots will you observe each day?
    Example: 6:00-6:30, 6:30-7:00, 7:00-7:30, 7:30-8:00, 8:00-8:30 and
    8:30-9:00 (Each person could watch one hour).

    b. Track the **same** channel during the **same** time slot for two days.

2. Using the provided frequency table, record which product is being advertised
    and the frequency. You may choose to be specific, such as "Pepsi™" or general
    such as "Sodas".

    Note: Optional watching directions:
    a. Pick two half-hour time slots will you observe each day.
    b. Pick one or two channels to track for 5 days (Monday-Friday) Track
    each channel during the same time slot each day.
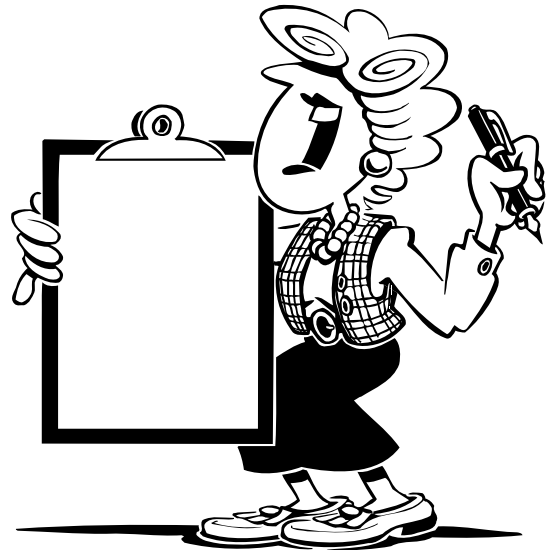
Item 2: Predictions

After all data is collected, please examine your data and answer the following questions:

1. Was the number of commercials the same for each time slot?

2. What products were advertised most often? Were these products advertised in all of the time slots?

3. Did the advertising change based on the time of day? How?

4. What tactics do advertisers use to try to get you to buy their products?

5. Based on your data, can you make a prediction about the number of commercials you might see during a 2-hour movie special? What is your prediction? Why?

Item 3: Display your Data

The data you gather can best be presented to a group in the form of a visual display.

Discuss how you will display your data. You may use a bar graph, table, line graph or some other graphic representation to show people the patterns and trends you have identified.

Create a graphic representation of your data that will present the patterns or trends you have noticed.

Name_____Date_____

Item 4: Presentation

1. With your group, decide what information you will discuss about what you learned
from the data you collected.
Be sure to discuss the following:
a. The number of commercials shown during the times you watched.
b. The types of products you viewed most often.
c. Which display you used for your data and why.

Everyone in your group must participate in the presentation.

How Much Do You Make?

A survey of salaries obtained the following information:

Name, Profession	Yearly Salary
Liam Letter, Mailman	$35,000
Jose Hammer, Construction Foreman	$40,000
Tyrelle Tack, part time clerk	$8,000
Nancy Number, Accountant	$60,000
Susie Shirt, Retail Clerk	$20,000
Brittney Book, Librarian	$35,000
Jamal Junebug, Gardner	$25,000

1. Your class obtains an 8th salary for Karen Company, a CEO, who makes $1,250,000 and adds it to your set of data. How does this new information change your analysis of salaries? Does it affect the median, mode, range, inter-quartile range, lower quartile, upper quartile? (Hint – calculate before and after)

2. If you were to graph the original data, which graph would you use? How would the new information affect this graph? (Hint – graph them here)

3. What would happen to this graph if you added a 9th salary for Dave the Driller, who makes $10,000? (Hint – recalculate new measures)

4. Which measure is best used for salaries: mean, median, or mode? Why?

Who's the Best?

The first table of Basketball Data shows how many points four basketball players scored for seven different games.

Basketball Data

Game	Player A	Player B	Player C	Player D
1	12	18	24	15
2	13	21	14	24
3	12	15	14	16
4	14	13	22	20
5	11	16	25	20
6	20	18	16	12
7	16	18	11	17

1. Look at the example for Player A in the second table. Then calculate the missing statistical measures for Players B, C, and D.

	Player A	Player B	Player C	Player D
mean	14			
mode	12			
median	13			
range	9			
max	20			

2. Next, rank the players for each category. High score has been completed for you.

	High Score	Median	Mean	Mode	Range
Highest	C				
2nd	D				
3rd	B				
4th	A				

3. Look back at your ranking for range. Did you rank the largest range as the best? Why (not)?

4. What does range tell us?

5. Is a player with a large range a consistent scorer?

6. Which player do you think is the best based on the measures of central tendency that you have calculated? Make sure to justify your reasons using the data.

Group Task: Arguing Who's the Best

Your task as a group is to:

✓ Decide which player you think is the MVP.

✓ Give at least two reasons supporting your decision based on the measures of central tendency.

✓ Explain your reasoning with a comparison of graphical representations of the data. (ex. Boxplots, back to back stem & leaf plots, etc)

✓ Create a poster that demonstrates your argument.

✓ Make an oral presentation of your findings.
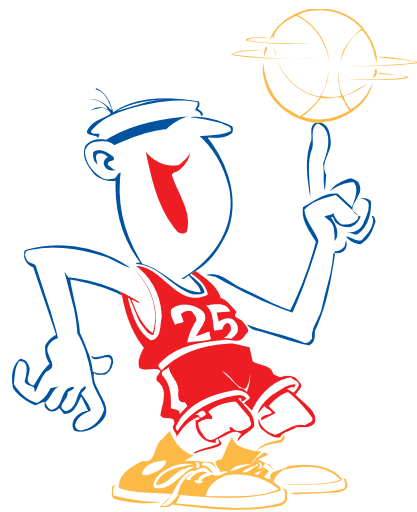
Graphing and Arguing from Box Plots - Using a Graphing Calculator

1. Enter the data for Players B, C, and D in lists 1, 2, and 3.

2. Graph Player B in statplot 1, Player C in statplot 2, and Player D in statplot 3.

3. Draw what you see on the calculator using the number line below. Player A has been graphed for you.
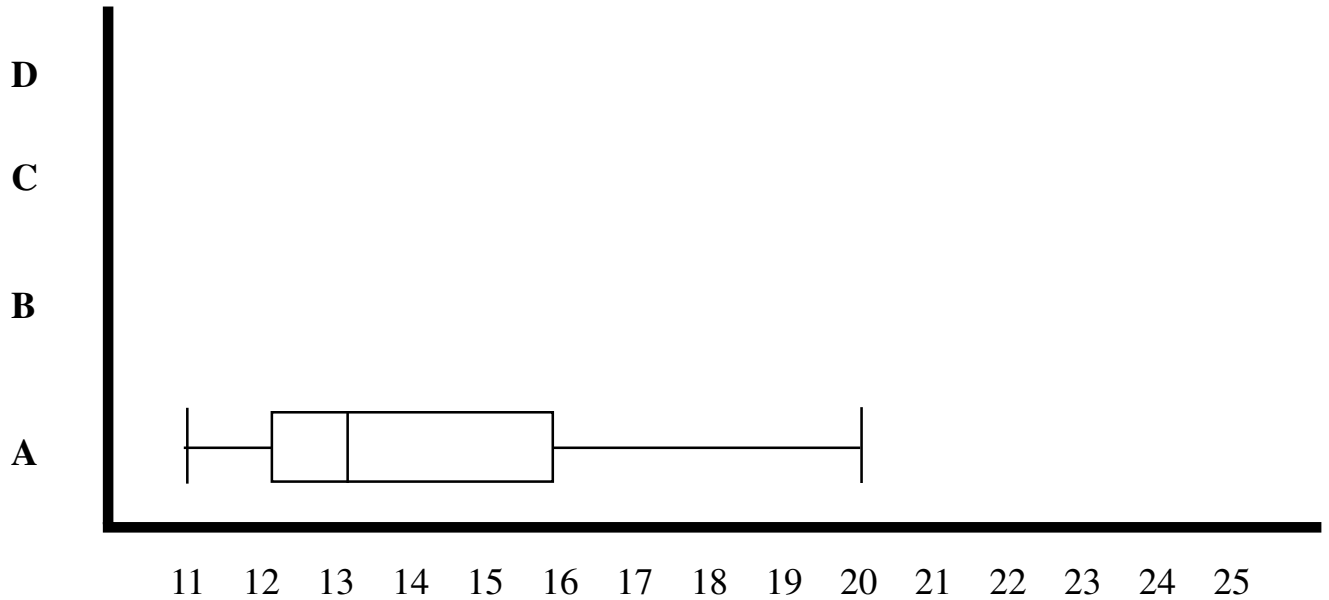
4. Which player appears to you to be the best according to the box and whisker plots? Why do you think so?

5. Does that match what you previously decided based on measures of central tendency? Why(not)?

6. Use the trace function and arithmetic to determine each of the following:

	Player A	Player B	Player C	Player D
minimum	11			
lower quartile	12			
median	13			
upper quartile	16			
maximum	20			
interquartile range	4			
range	9			

7. After analyzing the statistics plotted in the graph, did your MVP change? Why (not)?

8. Explain how the box and whisker plot helps to visually represent which player is the best.

Name_____**Date**_____

Use the back-to-back stem and leaf plot below to answer the following questions.

Ms. B's Class			Miss C's Class
2	6		
0	7	5 6 7	
8	8	2 5 9	
9 8 5	9	5 5	
0	10	0	
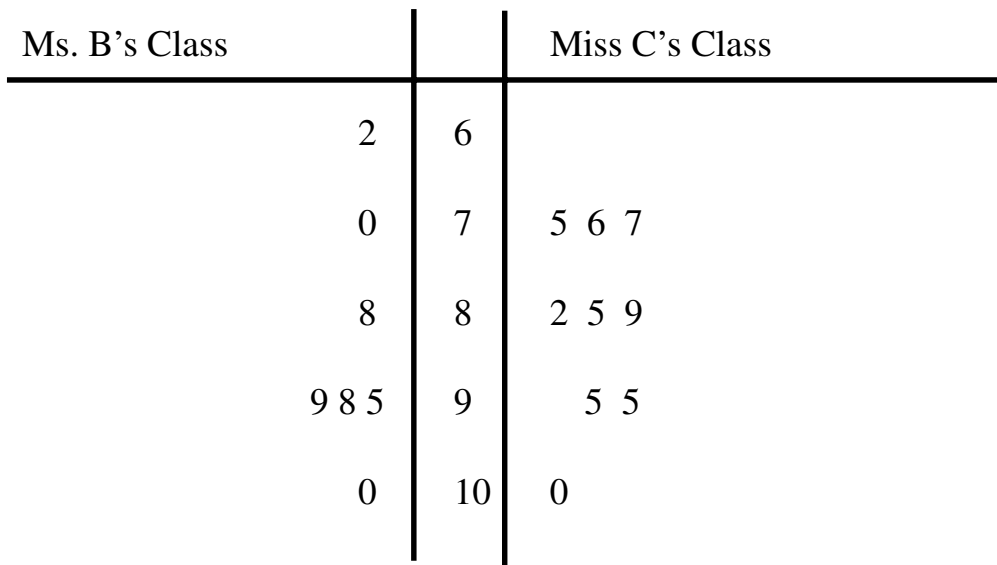
1. Determine the mean, median, and mode for each set of data.

2. List three comparison statements for Ms. B's and Miss C's test scores.

    1. _____

    2.

    _____

    3.

    _____

3. Does there appear to be a relationship between the scores is Ms. B's class and the scores in Miss C's class? How can you tell?

Mean, Median, Mode Bingo

B	I	N	G	O
1	16	31	46	61
2	17	32	47	62
3	18	33	48	63
4	19	34	49	64
5	20	35	50	65
6	21	36	51	66
7	22	37	52	67
8	23	38	53	68
9	24	39	54	69
10	25	40	55	70
11	26	41	56	71
12	27	42	57	72
13	28	43	58	73
14	29	44	59	74
15	30	45	60	75

Mini Review – Patterns

Find a rule describing each set of ordered pairs, (*x, y*) below.

1. $\{(2,3),\ (6,7),\ (9,10)\}$

2. $\{(9,3),\ (6,6),\ (5,7),\ (1,11)\}$

3. $\{(8,4),\ (6,3),\ (10,5)\}$

4. $\{(7, 0,7),\ (85, 8,5),\ (7.2, 0.72)\}$

Graph each set of ordered pairs below. Determine whether each relation is linear or nonlinear.

5. $\{(0,1),\ (-2, -5),\ (2, 7),\ (4, 13)\}$

6. $\{(0,0),\ (1,1),\ (2,4),\ (-1,1),\ (-2,4\ )\}$

7. $\{(1,12),\ (3,4),\ (6,2)\ (12,1)\}$

8. $\{(5,0),\ (7,-2),\ (3,2)\ (1,4)\}$

Solve each problem below.

Mark runs a paper route and notices a relationship between his sales and his profits.

Sales	Profits
$30	$10
$45	$15
$60	$20

9. If he has sales of $210, how much profit will he make?

10. If he needs to make $100 profit one month, how much will he need in sales?

11. The ordered pairs listed here show the year and the number of cellular phones in a community. Graph the ordered pairs and predict how many cell phones there will be in 2010.

(year, number of cellular phones): (1991, 100), (1992, 170), (1993, 240), (1994, 310), (1999, 660)

Name_____Date_____

Mini Review - Graphs

I. Create a circle graph from the data below. The data show the percent of sales
from companies producing gummy candy products.

| Life Savers | 32% |
Hershey's	22%
Brach	12%
Foreign	11%
Trolli	8%
H. Heide	6%
Other	9%

II. Create a double bar graph from the data below. The data show federal spending on research and
development. Make a bar for defense and non-defense related spending.

Year	Defense	Non-defense
1960	7.5 billion	6.0 billion
1970	11.4	11.7
1980	18.4	44.2
1990	46.6	99.9

Mini Review – Graphs (cont.)

III. Use the graph to answer the questions below.

Percentage of Cigarette Smokers by Race and Age
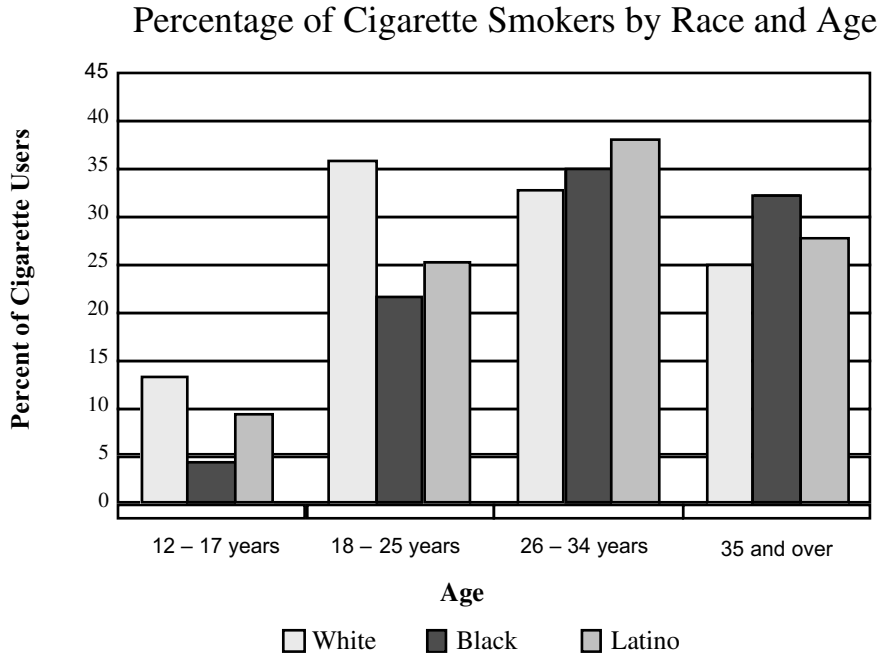
1. About what percent of Latinos in the age group 18-25 years are smokers?

2. Which age group has the highest percentage of white smokers?

3. In which age group are there more Black than Latino smokers?

4. Why do you think there is a higher percentage of white smokers in the age groups for 12 – 25 years?

5. Why do you think the percentage of smokers in all races decreases starting at age 35?

Mini Review - Graphs (cont.)

Use the graph to answer the questions below.

Number of U.S. Citizens 85 Years and Older
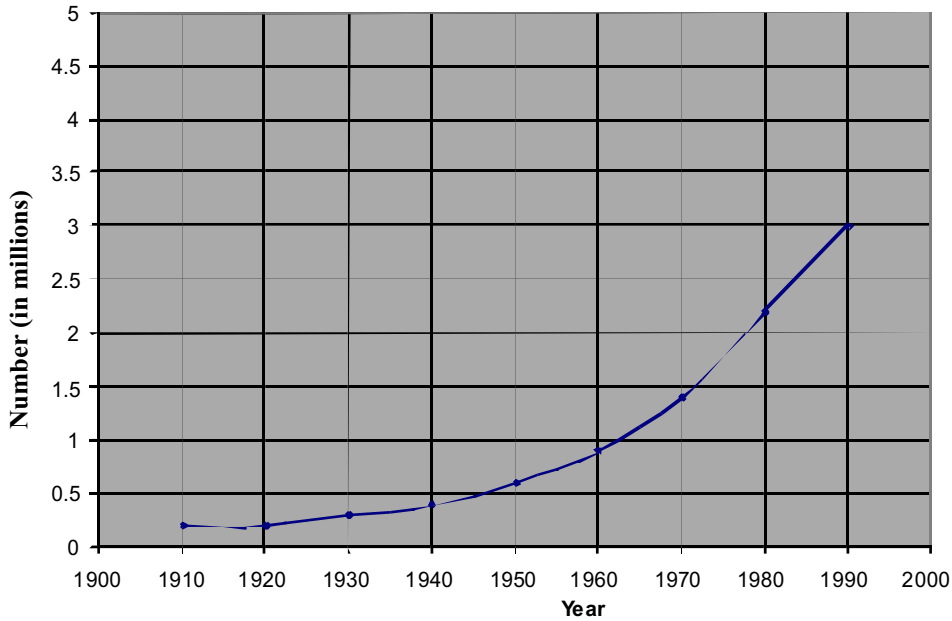
1. About how many people 85 and over were in the US in 1950?

2. In what year were there approximately one million citizens in this age group?

3. What was the increase in the number of people in this age group from 1970 to 1980?

4. What was the increase in the number of people in this age group from 1910 to 1940?

5. Starting in 1920, about how many years did it take for the number of people in this age group to increase by one million?

6. Starting in 1970, about how many years did it take for the number of people in this age group to increase by one million?

7. Predict the number of people in this age group in the year 2000.

Jump Rope Task

(adapted from *Connected Mathematics Project: Data About Us*. Menlo Park, CA.: Dale Seymour Publications, 1998)

The following data is the number of consecutive jumps that each student was able to do using a standard jump rope. The data is taken from two 7th grade classes.

Mrs. A's Class		Mr. B's Class	
Boy	5	Boy	1
Boy	35	Boy	30
Girl	91	Boy	28
Boy	62	Boy	10
Girl	92	Girl	27
Girl	23	Girl	102
Boy	16	Boy	47
Boy	1	Boy	8
Boy	8	Girl	160
Boy	11	Girl	23
Girl	93	Boy	17
Girl	27	Boy	2
Girl	88	Girl	68
Boy	26	Boy	50
Boy	7	Girl	151
Boy	7	Boy	60
Boy	1	Boy	5
Boy	40	Girl	52
Boy	7	Girl	4
Boy	20	Girl	35
Girl	20	Boy	160
Girl	90	Boy	1
Boy	29	Boy	3
Boy	11	Boy	8
Boy	113	Girl	48
Boy	33	Boy	42
Girl	45	Boy	33
Girl	80	Girl	300
		Girl	104
		Boy	53

Jump Rope Task continued

Analyze the data to answer the following questions:

1. Which class of students is better at jumping rope?

2. Which gender are better jumpers?

3. If a student from this set is selected to represent the 7th grade in a jumping contest, what is the chance the student picked can jump at least 90 times?

Create a poster that displays information that supports your group's analysis. Make sure you include the answers to the questions listed above.