

6TH

GRADE

MATH

Unit 11

Analyzing and
Understanding Data
Distributions

Date:

Extra! Extra! Read all about it!

We are going to start Unit 11 (Analyzing and Understanding Data Distribution). Here is a list of IXL topics, for every topic you complete you will earn some extra credit. Here are the possible points you can earn on each topic. The extra credit will be due by _____ **Smart Score on IXL - REVIEW PREVIOUS GRADNG SCALE.**

Unit 11 Topics – You can earn up to 100 extra credit points! You got this 😊

6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

1. Identify statistical questions (6-HH.1)

6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center (mean, median, mode), spread (range), and overall shape.

2. Describe distributions in line plots (6-HH.)
3. Create line plots (6-GG.4)
4. Interpret stem-and-leaf plots (6-GG.18)
5. Create stem-and-leaf plots (6-GG.19)
6. Calculate quartiles and interquartile range (6-HH.7)
7. Box plots (6-GG.20)

6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

8. Mean, median, mode, and range: find the missing number (6-HH.4)

6.SP.B.4 Display a single set of numerical data using dot plots (line plots), box plots, pie charts and stem plots.

9. Create histograms (6-GG.12)
10. Create line plots (6-GG.4)
11. Box plots (6-GG.20)

6.SP.B.5.a Report the number of observations.

12. Interpret histograms (6-GG.11)
13. Interpret line plots (6-GG.3)

6.SP.B.5.b Describe the nature of the attribute under investigation, including how it was measured and its units of measurement.

14. Identify representative, random, and biased samples (6-HH.9)

6.SP.B.5.c Give quantitative measures of center (median and/or mean) and variability (range) as well as describing any overall pattern with reference to the context in which the data were gathered.

15. Calculate mean, median, mode, and range (6-HH.2)
16. Interpret charts and graphs to find mean, median, mode, and range (6-HH.3)
17. Calculate mean absolute deviation (6-HH.6)
18. Calculate quartiles and interquartile range (6-HH.7)
19. Describe distributions in line plots (6-HH.)
20. Identify an outlier and describe the effect of removing it (6-HH.)

Statistical Questions	Name: _____	Date: _____
Daily Target: I can determine whether or not a question is statistical or not.		

Statistical Question

A _____ questions has _____ possible _____ responses. (The answers will vary).

**Ask whether or not you can have more than one answer. Ask yourself if you can gather data from that!*

Examples: Statistical = S; Not Statistical = NS

- | | | |
|---|---|----|
| How much do people exercise each day?
<i>(Based on multiple people – so multiple answers!)</i> | S | NS |
| How much did I exercise yesterday?
<i>(Based on only ONE person – so only ONE answer!)</i> | S | NS |
| How many pages are in my science textbook?
<i>(Based on only ONE book – so only ONE answer!)</i> | S | NS |
| How many pages are in sixth grade textbooks?
<i>(Based on multiple books – so multiple answers!)</i> | S | NS |
| How tall is my best friend?
<i>(Based on only ONE person – so only ONE answer!)</i> | S | NS |
| How tall are my classmates?
<i>(Based on multiple people – so multiple answers!)</i> | S | NS |

Practice!

True or False:

- | | | |
|---|---|---|
| “How many days are in March?” is a statistical question. | T | F |
| “How old is your dog” is NOT a statistical question. | T | F |
| “Do you like watermelons?” is NOT a statistical question. | T | F |
| “On average, how old are the dogs that live on this street is a statistical question. | T | F |

Statistical Questions

Name: _____

Date: _____

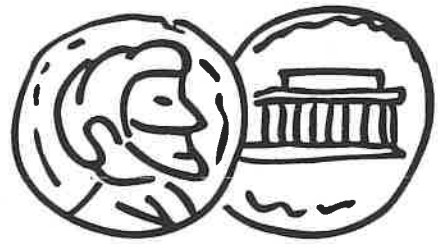
Daily Target: I can determine whether or not a question is statistical or not.**Remember:**

If the question has MULTIPLE answers it is a statistical question! If the question only has ONE answer, it is NOT a statistical question!

Practice!*Determine if the questions is statistical or not.*

What was the temperature at noon today at City Hall?	S	NS
How many bricks are in this wall?	S	NS
What proportion of the students at your school like watermelons?	S	NS
How tall are the students in my class?	S	NS
What grades did students score on the test?	S	NS
How many marbles are in the jar?	S	NS
What was the difference in rainfall between March and April?	S	NS
Will I score a basket in the game tonight?	S	NS
What does this apple cost?	S	NS
How fast can dogs run 100 yards?	S	NS
Does a chocolate bar weigh more than a pack of jelly beans?	S	NS
How many miles can cars travel on a gallon of gas?	S	NS
How often do adults eat breakfast?	S	NS

WHAT HAS ONE HUNDRED HEADS AND ONE HUNDRED TAILS?



Read each question and determine if it is statistical or not.

	Statistical	Not Statistical
① How old are the students at Mallory University?	D	A
② How old is Steve's neighbor, Bob?	B	S
③ How many pets does the pet store have for sale?	M	E
④ How many video games do students at your school own?	N	J
⑤ What was the highest score on the last math test?	T	E
⑥ What are the math grades of students at Wilson Jr. High?	N	R
⑦ How old are the athletes on the baseball team?	O	Y
⑧ What is Jill's favorite TV show?	V	D
⑨ How many touchdowns did Michael Waters score this year?	A	E
⑩ How tall are the people in your family?	N	O
⑪ What TV shows do adults age 18-25 like?	N	F
⑫ How many people ate at The Pasta Factory last month?	H	R
⑬ How old are the cars in a parking lot?	P	I
⑭ What was the winning mile time at the track meet?	A	H
⑮ What were the mile times from the track meet?	I	L
⑯ How tall are the buildings in New York City?	E	W
⑰ Where did the Gutierrez family go on vacation last year?	I	U

Finding the Mean

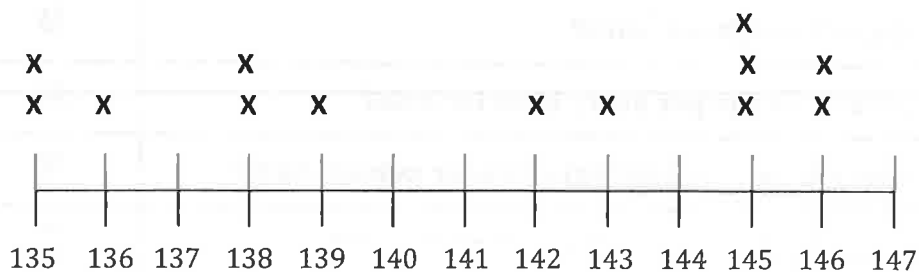
Name: _____

Date: _____

Daily Target: I can find the mean in a given set of numbers/data.

Mean	Average
The _____ in a given set of numbers or data.	When you take _____ of the data added and _____ it by the amount of _____ in the data set you have.

Line Plot of Student Height:

*Height of students in centimeters*

Step One:

_____ the numbers in the given _____ set.

Step Two:

_____ up all of the numbers in the data set.

Step Three:

_____ how many numbers there are in the data _____.

Step Four:

_____ the sum of the data by how many _____ you have in the data set.



Try it!

<p>What's the mean average? Show your working</p>	<p>What's the mean average? Show your working</p>



Independent Task

	Mean Average & Working
a 14, 12, 9, 2, 3, 1, 1	
b 10, 10, 10, 5, 9, 12, 12, 24, 8, 31, 3, 10	
c 102, 156, 150, 67	
d 1, 2, 3, 3, 2, 1, 1, 2, 3, 4, 5, 6, 6, 5, 4	
e 19, 14, 26, 100, 56, 32, 1, 4	
f 50, 50, 40, 40, 30, 30, 20, 20, 10, 10	
g 14, 14, 14, 12, 12, 12, 12, 12, 12, 14, 14, 14	
h 205, 422, 167, 800, 581, 671	
i 1004, 1009, 1010, 1015, 1000	
j 9605, 5320, 6802, 1202, 3337, 8912, 6822	

Review

I got _____ correct out of 10. To improve I need to...

Median, Mode, and Range

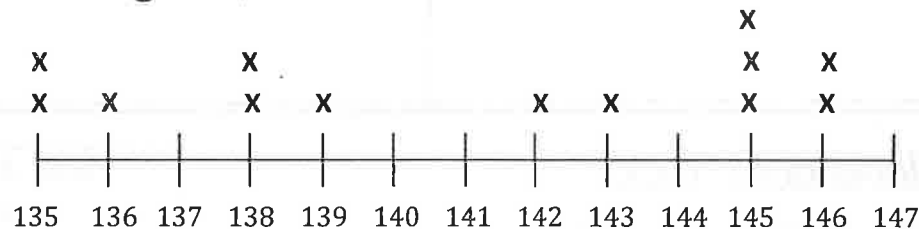
Name: _____

Date: _____

Daily Target: I can find the mode, median, and range in a given set of numbers/data.

Median	Mode	Range
The _____ (or average of the middle) of a _____ set of numbers or data.	The most _____ number(s) in a given set of _____ or data.	The _____ between the smallest and _____ number in a given set of _____ or data.

Line Plot of Student Height:



Height of students in centimeters

Step One:

_____ the numbers in the _____ data set.

Step Two:

Order the numbers from _____ to greatest.

Finding Median:

Step Three:

In pairs, _____ off a number from each side of the list until you only have one left. That is the median. If there are two, you must find the _____ of the two in the middle.

Finding Mode:

Step Three:

Find the number that shows up the _____ often. (Sometimes there is more than one)

Finding Range:

Step Three:

Find the _____ (subtract) between the greatest number and the least number in the _____ of numbers or data.

Median, Mode, and Range

Name: _____

Date: _____

Daily Target: I can find the outlier in a given set of data or information.

Outlier

A _____ that doesn't belong because it's too _____ or too low.

**The _____ is the best measure of center when there is NO outlier.*

**The _____ is the best measure of center when there IS an outlier.*

Step One:

_____ the mean, median, and mode of the given data set.

Caesar's Test Scores: 84, 80, 78, 90, 76, 88, 86, 80

Mean: _____

Step Two:

Determine if there is an _____ in the given _____ or numbers.

Median: _____

Step Three:

Determine the _____ measure of center.

Outlier – median

No outlier – mean

Mode: _____

Is there an outlier? _____

What is the best measure of center? _____

Practice!

1) Basketball Team Scores: 24, 35, 18, 20, 17, 30

Mean: _____

Median: _____

Mode: _____

2) Softball Team Scores: 14, 9, 20, 5, 17, 9, 5

Mean: _____

Median: _____

Mode: _____

2) Daily Theater Attendance: 116, 130, 120, 125, 140, 125

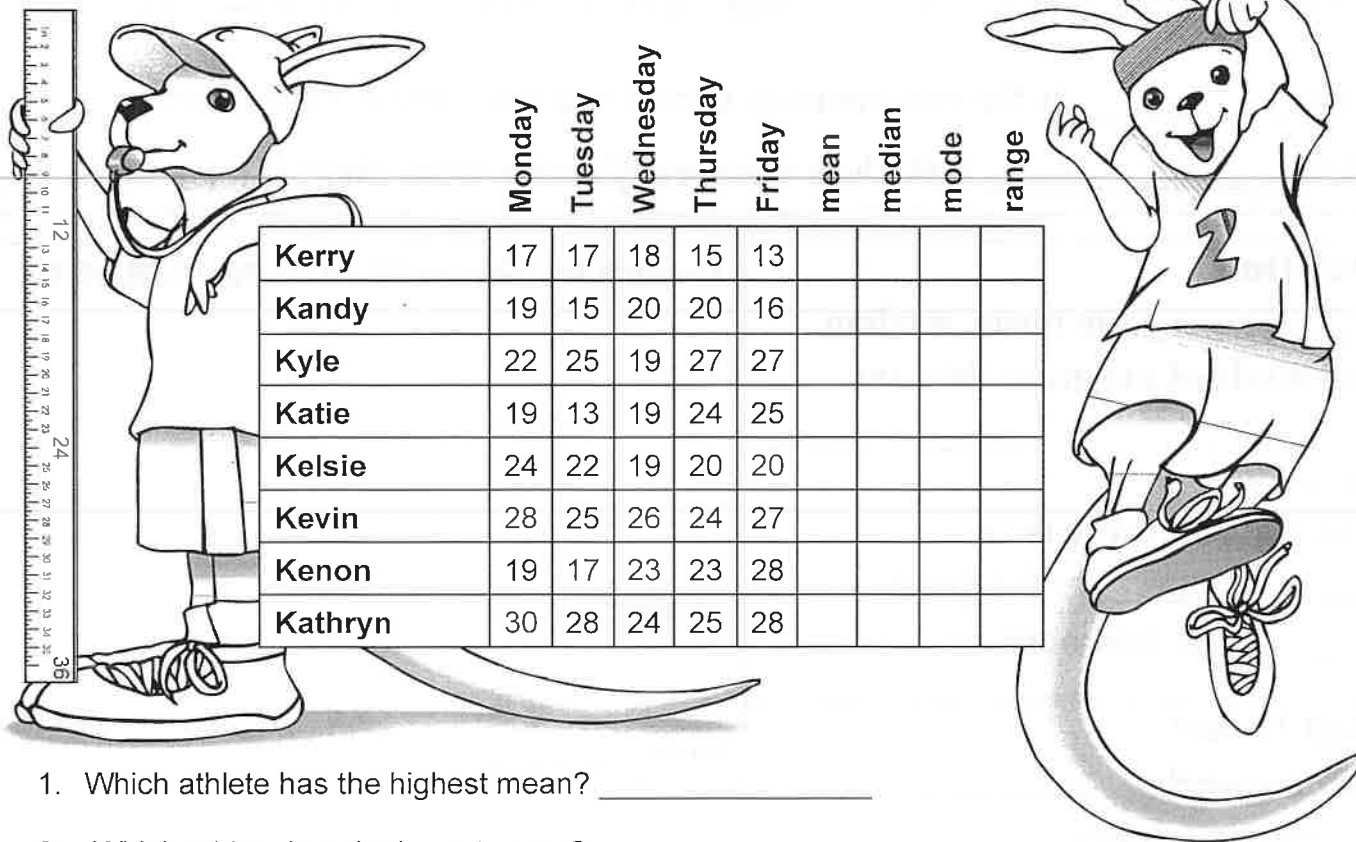
Mean: _____

Median: _____

Mode: _____

Getting a Jump on Statistics

The Aussie Middle School track team has been practicing for the long-jump competition. Each day, Coach Kanga has recorded each athlete's best long-jump distance in feet. Use the data in the chart below to calculate the mean, median, mode, and range of each athlete's long jumps. Then answer the questions that follow.



	Monday	Tuesday	Wednesday	Thursday	Friday	mean	median	mode	range
Kerry	17	17	18	15	13				
Kandy	19	15	20	20	16				
Kyle	22	25	19	27	27				
Katie	19	13	19	24	25				
Kelsie	24	22	19	20	20				
Kevin	28	25	26	24	27				
Kenon	19	17	23	23	28				
Kathryn	30	28	24	25	28				

1. Which athlete has the highest mean? _____
2. Which athlete has the lowest mean? _____
3. Which 2 athletes have the same mode? _____
4. Is the mean higher for Kelsie or Katie? _____ By how much?

5. Which athlete was most consistent in long-jump distances? (*Hint: Look at the range.*)

6. Which athlete was least consistent in long-jump distances? _____
7. Which 2 athletes have the same median? _____
8. The top 3 jumpers will compete in this weekend's competition. Which 3 athletes would you recommend? _____ Explain why.

Bonus Box: On which day of the week did the team have the highest mean? On which day did the team have the lowest mean?

Mario's Dilemma

Part 1



Below is a list of Mario's most recent test scores.

81% 95% 88% 85% 81%

Mean:
Median:
Mode:
Range:

1. Calculate the mean, median, mode, and range of Mario's test scores.
2. Mario wants to convince his parents that he is a math superstar. Which measure should Mario use?

3. Oh, no! Mario scored a 38% on his 6th test. How do you **THINK** the data will change? Without recalculating each value, explain what would happen to each of the above measures (become higher, lower, stay the same).

Mean: _____

Median: _____

Mode: _____

Range: _____

4. Find the mean, median, mode, and range, including the 6th test score.

Mean:
Median:
Mode:
Range:

5. How does the data change? Describe the change(s) for each measure. Be specific!

Mean: _____

Median: _____

Mode: _____

Range: _____

Part 2

Below is a list of Mario's first quarter test scores.

6. Calculate the mean, median, mode, and range of the data.

70% 89% 75% 36% 80%

Mean:
Median:
Mode:
Range:

7. What is Mario's current percent and letter grade in the class? _____

8. If Mario would have studied for the test and scored a 91% instead of a 36% on one of his tests, calculate the mean, median, mode, and range of the new scores.

Mean:
Median:
Mode:
Range:

9. What is Mario's new percent and letter grade in the class? _____

Dot Plots & Bar Graphs

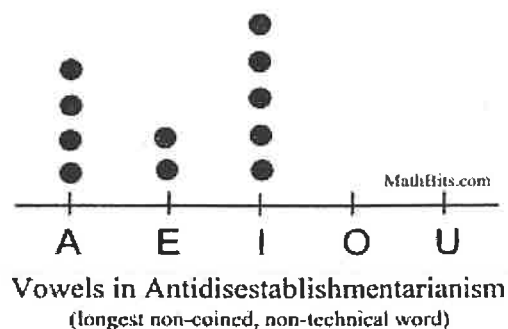
Name: _____

Date: _____

Daily Target: I can create a bar graph or dot plot from given data.

Dot Plot

A type of _____ using _____ to compare the _____ within categories or groups. Each dot represents _____ observation and are stacked to represent frequency.



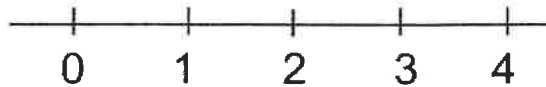
Practice!!

Students in Ms. Oakes class were surveyed asking the number of brothers and sisters in their families (not counting themselves). The results are displayed below.

Number of Brother/Sisters

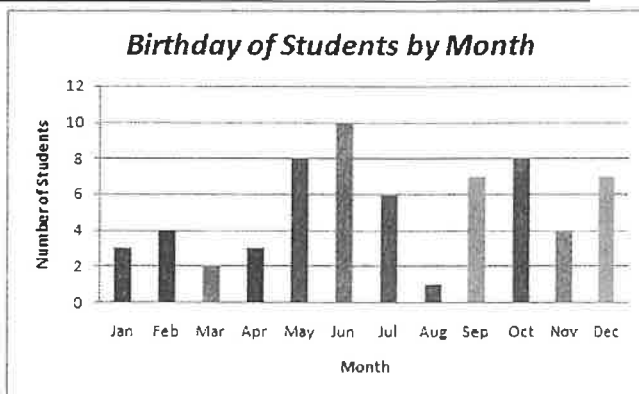
2, 4, 3, 2, 2, 1, 0, 2, 3, 2, 1, 1, 3, 0, 4

Plot the information on the dot plot given:



Bar Graph

A chart using _____ to show _____ between categories. The bars can be _____ or _____.

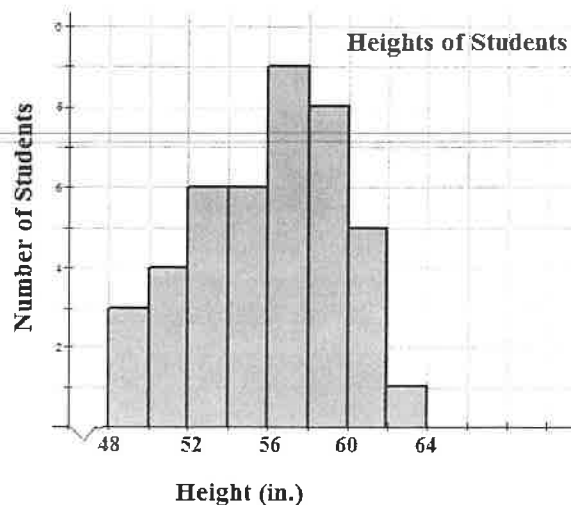


Practice!

Use the bar graph to answer the questions given!

1) Where does the data cluster?

2) What is the range?

3) What is the most common height? (*the mode*)

6. The data below represents the number of days of participation per month during one year in a city.
 12, 10, 11, 9, 9, 10, 12, 9, 8, 7, 9, 10

Make a dot plot of the data.



What does each dot represent? _____

How many months are represented? _____

Spread: _____ Symmetry: _____

Cluster: _____ Mean: _____

Outlier: _____ Median: _____

Peaks: _____ Mode: _____

Gaps: _____ Range: _____

6. The data below represents the number of days of participation per month during one year in a city.
 12, 10, 11, 9, 9, 10, 12, 9, 8, 7, 9, 10

Make a dot plot of the data.



What does each dot represent? _____

How many months are represented? _____

Spread: _____ Symmetry: _____

Cluster: _____ Mean: _____

Outlier: _____ Median: _____

Peaks: _____ Mode: _____

Gaps: _____ Range: _____

Data Distribution

Name: _____

Date: _____

Daily Target: I can identify the different ways data can be spread.

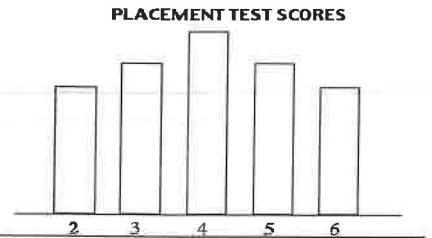
Measure of Variability

Measures of _____ are ways to measure the _____ in a set of data.

Different Terms:

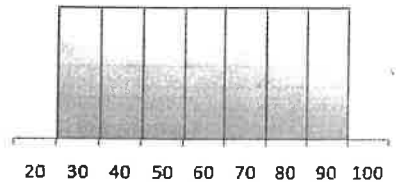
Symmetric:

When the _____ and right sides of the graph are _____ images of each other.



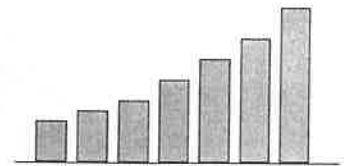
Uniform:

When the _____ of the data is the _____.



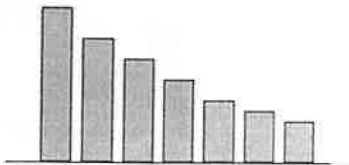
Skew Left:

When there is _____ data to the _____ than the other side.



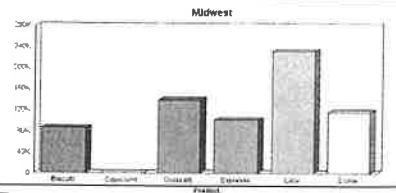
Skew Right:

When there is more _____ to the _____ than the other side.



Gaps:

When there is _____ data _____ other data



Peaks:

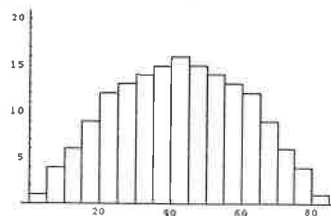
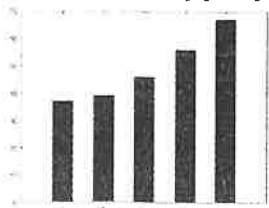
An _____ where the graph is _____ than the surrounding areas.

Clusters:

When _____ data points lie in a _____ area.

Practice!

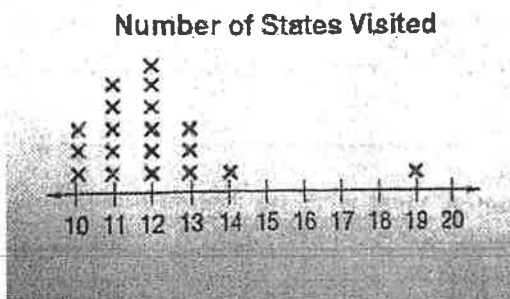
Label which type of graph is show: skew left, skew right, symmetric, uniform.



Name: _____

Data Analysis

1.



Spread: _____

Cluster: _____

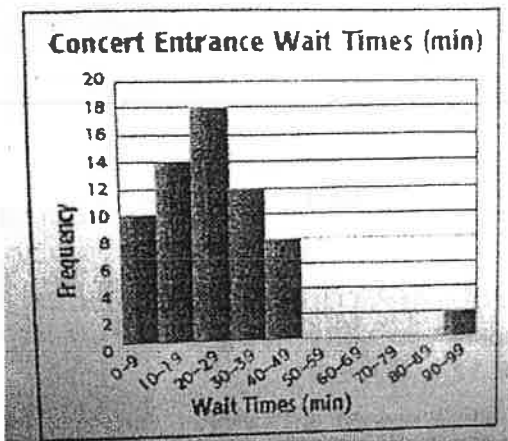
Outlier: _____

Peaks: _____

Gaps: _____

Symmetry: _____

2.



Spread: _____

Cluster: _____

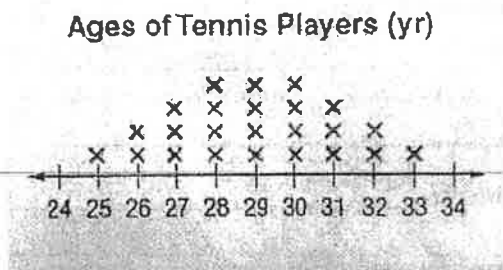
Outlier: _____

Peaks: _____

Gaps: _____

Symmetry: _____

3.



Spread: _____

Cluster: _____

Outlier: _____

Peaks: _____

Gaps: _____

Symmetry: _____

Mean: _____ Median: _____

Mode: _____ Range: _____

VIRUS X OUTBREAK

EMERGENCY NOTIFICATION

Doctors have identified a dangerous virus that is spreading across America. They have named it Virus X. When people become infected with Virus X they come down with a variety of symptoms including coughs, fevers, and nausea. While some people infected with Virus X recover; others turn into zombies.

You are part of a medical research team that works for the Center for Disease Control (CDC.) Your team has been flown to an airport in Oregon to study a group of people with Virus X. These patients are quarantined in the airport to prevent the virus from spreading.

Analyze their information and help the CDC understand the virus. Figure out where the virus is coming from and why some people recover while others become zombies.

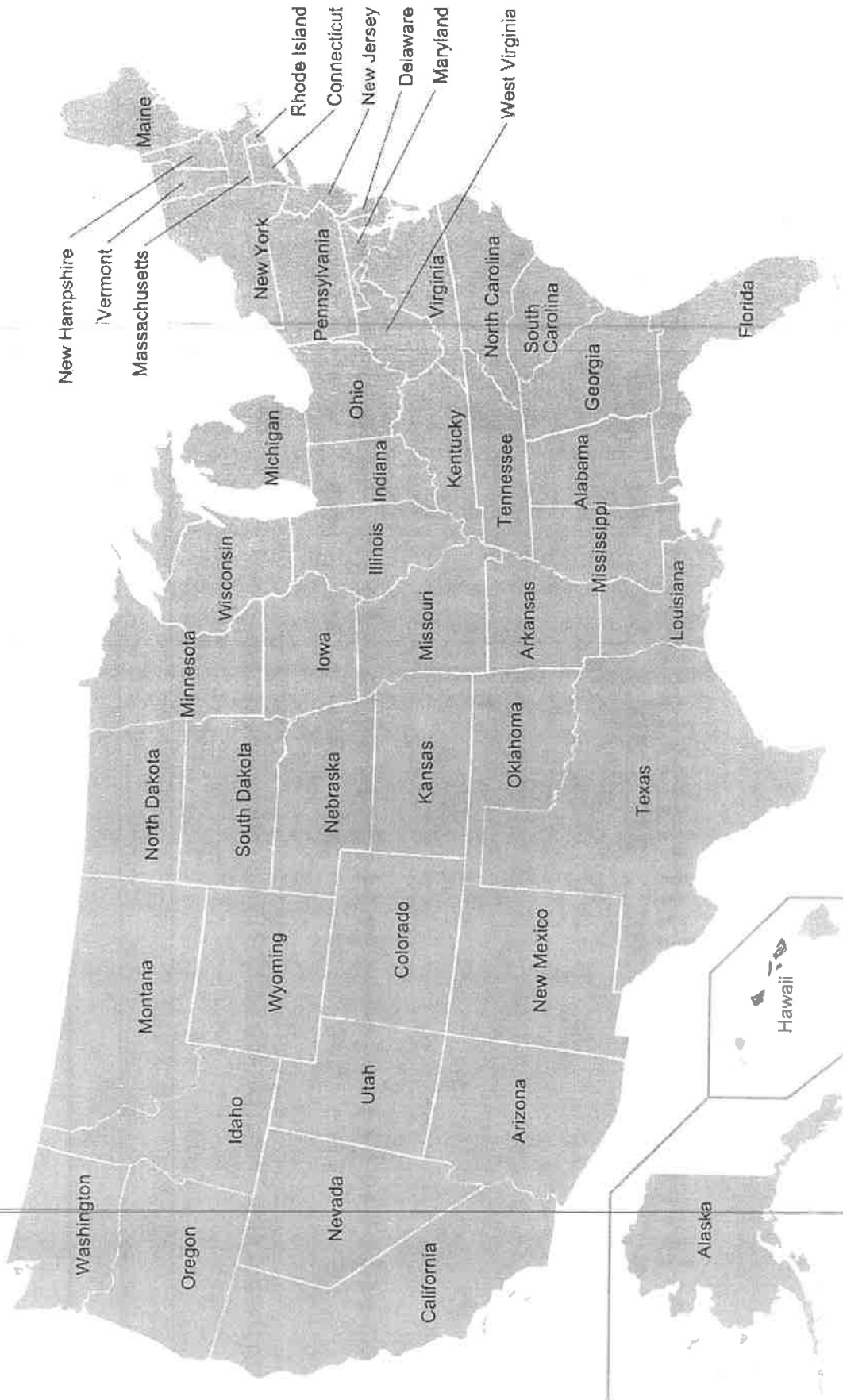
Research report prepared by: _____

Date: _____

Virus X Patient Data

Compiled from patients quarantined at the Portland International Airport

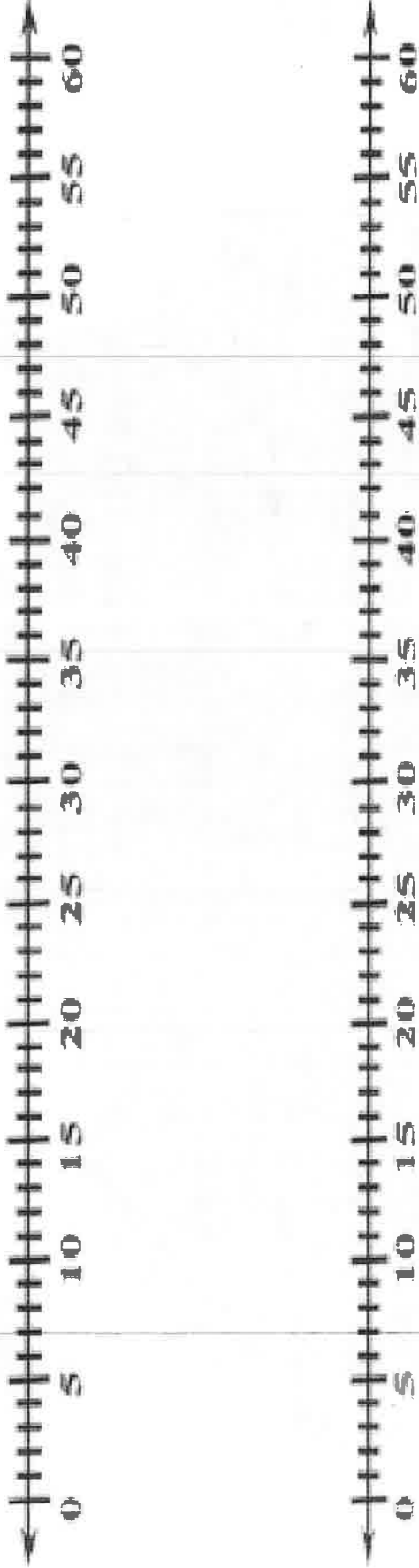
Name	Age	Symptoms	State	Days of illness before recovery or zombification	Zombified or Recovered
Ada	52	fever, headache	Georgia	6	Recovered
Skye	20	stomachache, headache	Wisconsin	11	Zombie
Anthony	11	stomachache, fever	Florida	8	Recovered
Samuel	5	fever, cough	Mississippi	8	Recovered
Ruth	29	fever, headache	Tennessee	13	Zombie
Jonathan	16	nausea, headache	Washington	5	Recovered
Eric	20	cough, fever	Florida	9	Zombie
Mia	15	fever, headache	Wyoming	9	Recovered
MInaya	4	fever, headache	Texas	5	Recovered
Giovanni	51	fever, headache	Alabama	5	Recovered
James	33	nausea, headache	Arizona	15	Zombie
Juliet	24	fever, headache	Oregon	12	Zombie
Naomi	41	nausea, headache	South Carolina	10	Zombie
Fatima	55	stomachache, fever	New York	14	Recovered
Andre	41	stomachache, headache	Montana	6	Zombie
Tyshawn	42	fever, headache	Arizona	9	Zombie
Christopher	51	stomachache, fever	Florida	8	Recovered
Jahmilia	11	fever, cough	Idaho	7	Recovered
Daniel	35	fever, nausea	Florida	8	Zombie
Mahmoud	60	fever, cough	California	3	Recovered
Gabrielle	12	nausea, cough	Georgia	5	Recovered
Katie	32	headache, fever	Pennsylvania	14	Zombie



Source: Wikimedia.com

1. Who recovers and who becomes zombified?

It's difficult to analyze the data in list form. Start your analysis by creating two dot plots on the number lines shown below. Make one dot plot for the ages of the people who became zombies and another dot plot for the ages of people who recovered. Be sure to title the dot plots.



Compare the dot plots. What do you notice? What conclusions can you draw?

Find the mean age of people who become zombies. Show your work:

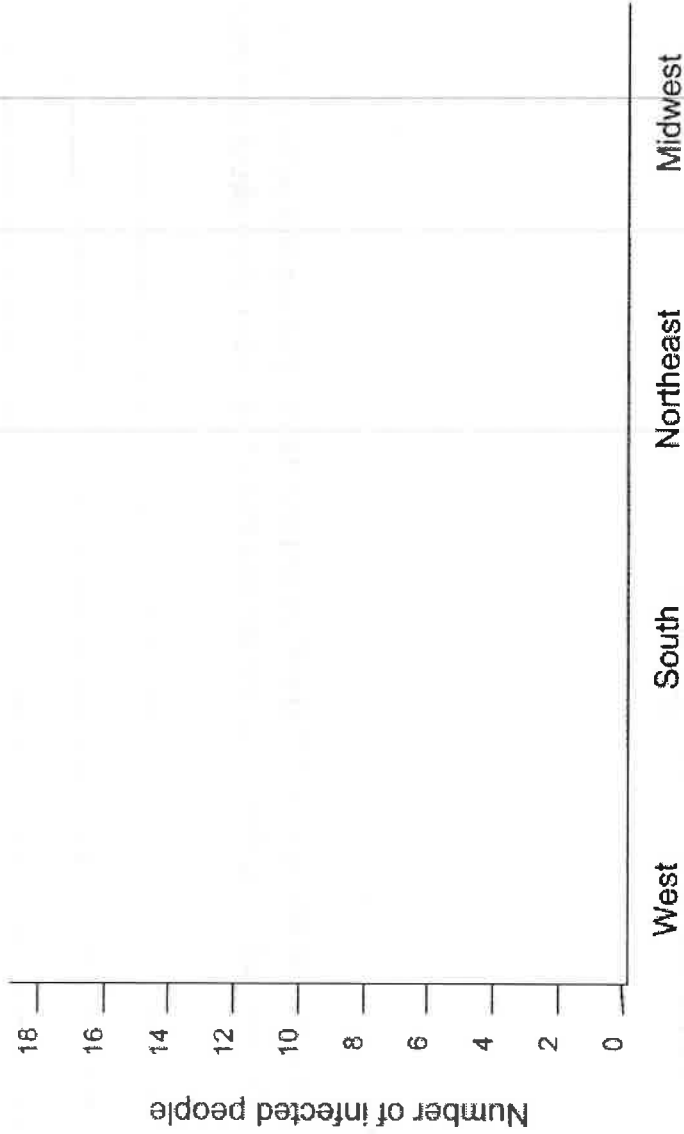
Find the mean age of people who recovered. Show your work.

Summarize:

What do you notice about the means that you just found? Do both statistics give a good picture of the data or are they misleading? If you had to give an update to the press, would you share the information about the means? Explain.

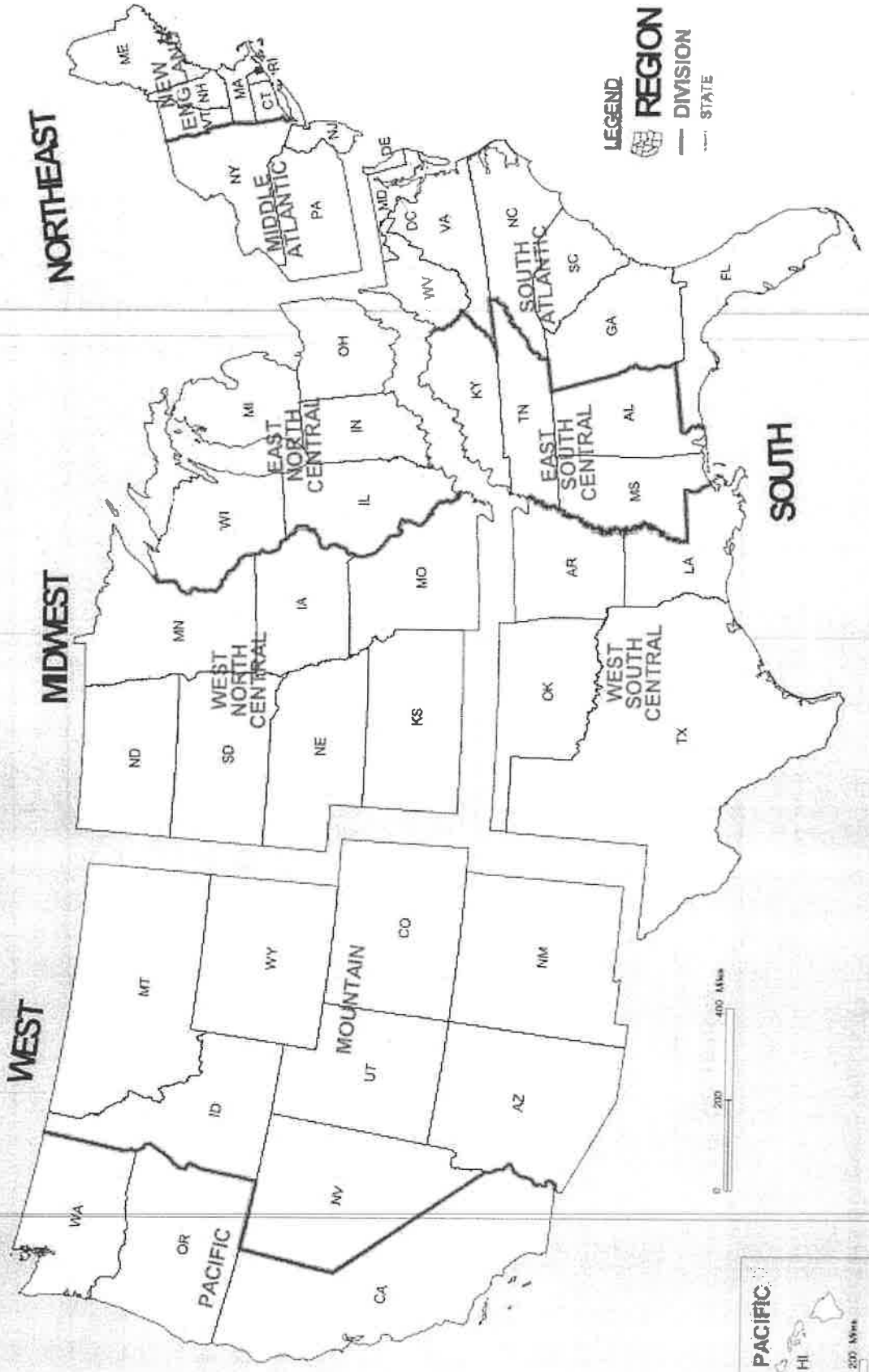
2. Where is VIRUS X originating?

Epidemiologists also want to figure out the source of the virus - they need to figure out where it's coming from. Use the data and the maps to create a bar graph showing where the infected people were traveling from.



What conclusions can you draw from the data? Use mathematical vocabulary.

Census Regions and Divisions of the United States



3. How can doctors diagnose VIRUS X?

Determine the most common symptoms experienced by people who become zombies by creating a frequency table.

Symptom	# of people who became zombies

4. Press release

Write a short article that can be published on the CDC's website explaining everything you've discovered about Virus X.

5. A New Victim: Dana Watson

A new patient has come to you for assistance. Answer her questions using the data to support your answers.

Dana: "Hello, my name is Dana. I'm 31 years old, and I'm from South Carolina. I've had a variety of symptoms: headaches, a fever, and a rash. Do you think I will recover or become a zombie?"

Doctor:

Dana: "Since I'm probably going to _____, how many days do you think it will take?" Provide her with a detailed overview of what to expect: let her know the range, the mean, and the median of days it will take.

Doctor:

Work Space:

ADDITIONAL NOTES

A series of horizontal lines for writing notes.

