Inspiring Greatness

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

Algebra IIB

The Data Unit - Graphing Numerical Data

April 24, 2020

Algebra IIB

Lesson: April 24, 2020

Objective/Learning Target: Students will create and interpret stem-and-leaf plots and dot plots

Let's Get Started:

Recall the definitions of Categorical and Numerical Data. Sort the types of data on the right into either "Categorical" or "Numerical"

Categorical Data - Data that can be sorted into groups and then counted, for example: gender, grade level, color, state lived in … You can identify categorical data by seeing if the order of the categories makes a difference. For instance, if I am looking at the colors of M&Ms, there is not a specific "starting" color.

Numerical/Quantitative Data - Numerical data is data that is measurable, such as time, height, weight, amount, and so on. You can help yourself identify numerical data by seeing if you can average or order the data in either ascending or descending order.

1. Male or female
2. Highest Level of Education
3. Test scores
4. Temperature in Alaska
5. Political Party Affiliation
6. Average salaries of doctors
7. Work Status: Full-time, part-time, unemployed
8. Level of pollutants

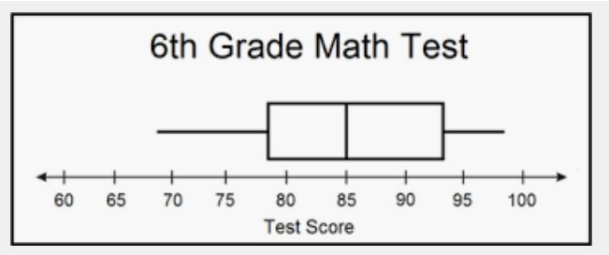
Categorical: 1, 2, 5, 7

Numerical: 3, 4, 6, 8

Examples of Numerical/Quantitative Graphs

HISTOGRAM

BOX PLOT



DOT PLOT

STEM-AND-LEAF PLOT

Race Running Times in Seconds

Stem	Leaves
12	2 6
13	0 2 5
14	1 2 4 6
15	2 3 7 8
16	1 2 4 6 8
17	5 7 8
18	1 3

Key: 14 | 2 = 14.2 seconds

All of the data on these types of graphs can be **ORDERED**. Because of the order, there is a **SHAPE** to the data, a **CENTER** to the data and a visible **SPREAD** of the data. We can also easily see any unusual data **(OUTLIERS).**

Stem-and-Leaf and Dot Plots

These two graph types plot every single data point in a data set. This gives you a very precise picture of what the data looks like. These graphs are not very good for very large data sets.

Dot Plots

To make a dot plot, look at the data and find the largest and smallest number. Make a number line listing all the numbers from smallest to largest. Then carefully place a dot the corresponding number for each data point.

Example:

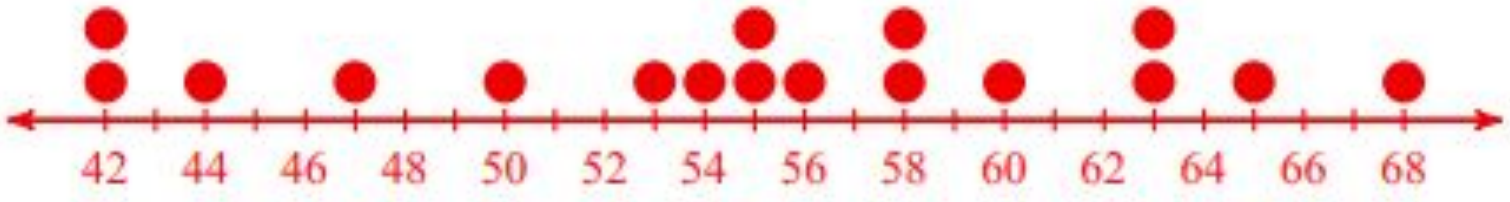
Age Assumed Office

Senator	Age
Bob Corker	54
Mitch McConnell	42
Elizabeth Warren	63
Bill Nelson	58
Rob Portman	55

Senator	Age
Bernie Sanders	65
Roger Wicker	56
Ted Cruz	42
Pat Roberts	60

Senator	Age
Barbara Mikulski	50
Jack Reed	47
Susan Collins	44
Al Franken	58

Senator	Age
Ron Johnson	55
Angus King	68
Ben Cardin	63
Claire McCaskill	53



Make a dot plot for the following 2 data sets:

1)

Academy Awards

Movie	# Awards
Platoon	4
The Broadway Melody	1
Shakespeare in Love	7
Unforgiven	4
Kramer vs. Kramer	5

Movie	# Awards
It Happened One Night	5
The Best Years of Our Lives	7
You Can't Take It with You	2
Cavalcade	3
Gone with the Wind	8

Movie	# Awards
Braveheart	5
How Green Was My Valley	5
All Quiet on the Western Front	2
The Departed	4
The Greatest Show on Earth	2

2)

Sales Tax

State	Percent
North Carolina	5
New Mexico	5
Illinois	6
Pennsylvania	6
Maine	6

State	Percent
Arkansas	7
South Carolina	6
Wyoming	4
New Hampshire	0

State	Percent
Arizona	6
Mississippi	7
Maryland	6
Michigan	6

State	Percent
Missouri	4
Nevada	7
Alabama	4
California	8

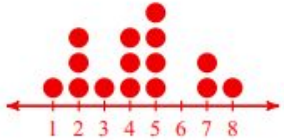
Dot Plot Answers

1) Academy Awards

Movie	# Awards
Platoon	4
The Broadway Melody	1
Shakespeare in Love	7
Unforgiven	4
Kramer vs. Kramer	5

Movie	# Awards
It Happened One Night	5
The Best Years of Our Lives	7
You Can't Take It with You	2
Cavalcade	3
Gone with the Wind	8

Movie	# Awards
Braveheart	5
How Green Was My Valley	5
All Quiet on the Western Front	2
The Departed	4
The Greatest Show on Earth	2



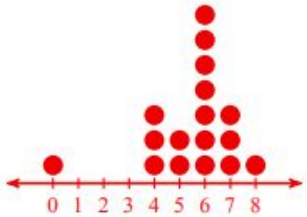
2) Sales Tax

State	Percent
North Carolina	5
New Mexico	5
Illinois	6
Pennsylvania	6
Maine	6

State	Percent
Arkansas	7
South Carolina	6
Wyoming	4
New Hampshire	0

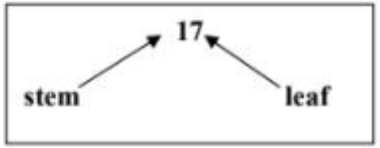
State	Percent
Arizona	6
Mississippi	7
Maryland	6
Michigan	6

State	Percent
Missouri	4
Nevada	7
Alabama	4
California	8



Stem-and-Leaf Plots

1. A stem and leaf plot is a method used to organize statistical data. The greatest common place value of the data is used to form the stem. The next greatest common place value is used to form the leaves.



2. **EXAMPLE**: Make a stem and leaf plot of the algebra test scores given below. Then complete each question.

56, 65, 98, 82, 64, 71, 78, 77, 86, 95, 91, 59, 69, 70, 80, 92, 76, 82, 85, 91, 92, 99, 73

1st put the scores in numerical order.

56, 59, 64, 65, 69, 70, 71, 73, 76, 77, 78, 80, 82, 82, 85, 86, 91, 91, 92, 92, 95, 98, 99

Since the data range from 56 to 99, the stems range from 5 to 9. To plot the data, make a vertical list of the stems. Each number is assigned to the graph by pairing the units digit, or leaf, with the correct stem. The score 56 is plotted by placing the units digit, 6, to the right of stem 5.

Stem	Leaf
5	6 9
6	4 5 9
7	0 1 3 6 7 8
8	0 2 2 5 6
9	1 1 2 2 5 8 9

Use the stem and leaf plot to answer these questions.

History Test Scores

Stem	Leaf
6	1 1 4 6 7 8
7	2 3 5 7 9
8	1 3 5 6 6 7 7 8 9
9	0 0 3 4 6 8 9 9
10	0 0

9. What is the best test score?
10. How many students took the test?
11. How many students scored 90?
12. What is the lowest score?
13. Find the difference between the high and low scores.

Use the ages of the people who attended a gymnastics meet to complete 14 – 17.

AGES: 12, 17, 15, 14, 19, 17, 13, 16, 15, 16, 17, 18, 24, 23, 28, 45, 48, 36, 12, 23, 15, 14, 13, 15, 17, 18, 19, 15, 15, 16, 16, 16, 16, 17

14. Make a stem and leaf plot of the data.
15. How many people attended the meet?
16. What are the ages of the youngest and oldest persons attending?
17. Which age group was more widely represented?

Use the stem and leaf plot to answer these questions.

History Test Scores

Stem	Leaf
6	1 1 4 6 7 8
7	2 3 5 7 9
8	1 3 5 6 6 7 7 8 9
9	0 0 3 4 6 8 9 9
10	0 0

9. What is the best test score? ➔ **100**
10. How many students took the test? ➔ **30**
11. How many students scored 90? ➔ **2**
12. What is the lowest score? ➔ **61**
13. Find the difference between the high and low scores. ➔ **39**

Use the ages of the people who attended a gymnastics meet to complete 14 – 17.

14. Make a stem and leaf plot of the data.

AGES: 12, 17, 15, 14, 19, 17, 13, 16, 15, 16, 17, 18, 24, 23, 28, 45, 48, 36, 12, 23, 15, 14, 13, 15, 17, 18, 19, 15, 15, 16, 16, 16, 16, 17

Stem	Leaf
1	2 2 3 3 4 4 5 5 5 5 5 5 6 6 6 6 6 6 7 7 7 7 7 8 8 9 9
2	3 3 4 8
3	6
4	5 8

15. How many people attended the meet? ➔ **34**
16. What are the ages of the youngest and oldest persons attending? ➔ **12 years and 48 years**
17. Which age group was more widely represented? ➔ **teens**

Back-to-Back Stem and Leaf Plots

Back-to-Back Stem and Leaf Plots let you compare 2 sets of data that have the same stem in order to make comparisons. Watch this video Back-to-Back Stem and Leaf Plots and then complete the 3 practice problems.

Make back-to-back stem-and-leaf plots for the given data.

1)

A	128	509	129	943	505	125	129	506	945	127
B	942	126	507	126	943	509	942	124	504	947

Leaf B	Stem	Leaf A

Key: 12|7 = _____

2)

A	6.5	8.1	1.3	8.9	3.4	8.1	3.6	6.7
B	1.9	3.7	6.9	1.2	8.2	6.8	1.4	3.5

Leaf B	Stem	Leaf A

Key: 3|6 = _____

3)

A	46	76	27	48	47	29	76	46	27	71	43
B	27	49	74	26	75	45	29	76	41	26	74

Leaf B	Stem	Leaf A

Key: 4|8 = _____

1)

A	128	509	129	943	505	125	129	506	945	127
B	942	126	507	126	943	509	942	124	504	947

Leaf B	Stem	Leaf A
6 6 4	12	5 7 8 9 9
9 7 4	50	5 6 9
7 3 2 2	94	3 5

Key : 12|7 = 127

2)

A	6.5	8.1	1.3	8.9	3.4	8.1	3.6	6.7
B	1.9	3.7	6.9	1.2	8.2	6.8	1.4	3.5

Leaf B	Stem	Leaf A
9 4 2	1	3
7 5	3	4 6
9 8	6	5 7
2	8	1 1 9

Key : 3|6 = 3.6

3)

A	46	76	27	48	47	29	76	46	27	71	43
B	27	49	74	26	75	45	29	76	41	26	74

Leaf B	Stem	Leaf A
9 7 6 6	2	7 7 9
9 5 1	4	3 6 6 7 8
6 5 4 4	7	1 6 6

Key : 4|8 = 48