Aim: SWBAT construct dot plots, box plots, frequency tables, and histograms.

HW: Packet Pages 22 - 25
   Quiz Friday

Do Now: Packet Pages 16 - 18
Homework - Interpreting Data using Dot Plots & Box Plots

The double box plot below shows the weights, in pounds, of Labrador Retrievers and Cocker Spaniels from a veterinarian's office.

Dog Weights (in pounds)

Which type of dog shows greater variability in weight? Answer the following questions to help you decide.

1) The least weight for the Cocker Spaniel is _____ pounds.

2) The greatest weight for the Cocker Spaniel is _____ pounds.

3) Find the range of the Cocker Spaniels' weights. _____ - _____ = _____ pounds

4) The third quartile weight for the Cocker Spaniel is _____ pounds.

5) The first quartile weight for the Cocker Spaniel is _____ pounds.

6) Find the IQR for the Cocker Spaniels' weights: 27 - _____ = _____

7) The IQR for the weights of the Cocker Spaniels is _____ pounds

8) The least weight for the Labrador Retrievers is _____ pounds.

9) The greatest weight for the Labrador Retrievers is _____ pounds.

10) Find the range of the Labrador Retrievers' weights. _____ - _____ = _____ lbs

11) The third quartile weight for the Labrador Retrievers is _____ pounds.

12) The first quartile weight for the Labrador Retrievers is _____ pounds.

13) Find the IQR for the Labrador Retrievers' weights: _____ - _____ = _____

14) The IQR for the weights of the Labrador Retrievers is _____ pounds

15) The range and the IQR for Cocker Spaniels are _____ than for Labrador Retrievers.

Conclusion: Labrador Retrievers _____ have greater variability in weight than Cocker Spaniels.
Use the dot plot to answer questions 16 & 17.
The dot plot shows the grades that a class of students received on their social studies homework assignment.

16) What is the first quartile grade?
   A) 75  B) 80  C) 85  D) 90

17) What is the third quartile grade?
   E) 85  F) 90  G) 95  H) 100

Use the dot plot to answer questions 18 & 19.
The double box plot shows the vocabulary quiz scores For Mr. Edelman's first and second period classes.

18) What is the interquartile range of the first period quiz scores?
   A) 5  B) 10  C) 15  D) 20

19) Which statement is true about the quiz scores?
   E) The range of the scores is the same for both classes. ✓
   F) The interquartile range of the scores was the same for both classes. ✗
   G) The median score was the same for both classes. ✗
   H) About 25% of the students in both classes scored 95% or higher on the quiz. ✗

20) The box-and-whisker plot shows the number of miles run per week by the members of the running club. What is the range of the data?
    A) 9 miles  B) 12 miles  C) 15 miles  D) 18 miles

21) The box-and-whisker plot shows the ages of the participants in a park clean-up. What is the interquartile range of the ages in years?
    A) 12  B) 16  C) 20  D) 32
Aim: SWBAT construct dot plots, box plots (also known as box-and-whiskers plots), frequency tables, and histograms.

Do Now:

1) Use the box plot to find the min, lower quartile, median, upper quartile, and max.

Minimum: 5
Quartile 1: 8.5
Median: 12
Quartile 3: 14
Maximum: 20

Inter-Quartile Range: 14 - 8.5 = 5.5

2) Use the dot plot to create a list. Then find the mean, median, mode, and range.

List the data: 21, 21, 23, 24, 25, 25, 27, 27, 27, 29, 31

Mean → $\frac{21+21+23+24+25+25+27+27+29+31}{10} = \frac{252}{10} = 25.2$
Median: 24
Mode: 27
Range: 31 - 21 = 10

Minimum (Min) - The smallest number

Maximum (Max) - The largest number

Lower Quartile (Quartile 1 or Q1) - The midpoint of the minimum and median. 25% of the data lies before this point.

Median - The midpoint of the data. 50% of the data lies before this point.

Upper Quartile (Quartile 3 or Q3) - The midpoint of the median and maximum. 75% of the data lies before this point.

Inter-quartile Range (IQR) - The difference of the quartiles (Q3 - Q1)

Box and Whisker Plot - A graph that depicts five key statistical data: Min, Q1, Median, Q3, and Max.

Dot Plot - A statistical diagram that represents a list by placing a dot over the corresponding number. The more dots tells you how often a number is repeated in a list.
Now let's review how to construct a box plot from a set of data.
A random sample of teenagers, ages 13 and 14, were asked "on average, how many text messages do you send per day?" The results were: 0, 10, 10, 10, 10, 20, 20, 20, 30, 50, 50, 50, 90, 100, 100

A box plot is a 5-number summary.

Example 1) The following are Robert's test scores for math class: 77, 83, 83, 88, 92, 94, 99
Construct a box and whisker plot for the data. Don’t forget to give your graph a title and label its axis.

Minimum: 77
Quartile 1: 83
Median: 88
Quartile 3: 94
Maximum: 99
Inter-Quartile Range: 94-88

Robert's Math Scores

Grades
Now let's review how to construct a dot plot from a set of data.

For each number in the data set, make a dot above that number. The number of dots above a number represents the number of times that number appears in the data set.

Example 2) Maria counts the number of cars that go by as she waits for the school bus in the morning. Construct a dot plot on the number line for her data. Don't forget to give your graph a title and label its axis.

0, 1, 2, 2, 3, 4, 4, 5, 6, 6, 6, 7, 7, 8, 8, 9, 11, 12

Possing Cars

Now let's review frequency tables and histograms.

Interval - A group of numbers such as 1-10 or 50-79

Frequency Table - A diagram that shows the amount of times an interval appears

Histogram - A bar graph like diagram used to show compare intervals with their frequency.
- Intervals must go on the x-axis and the bars must touch.
- Frequencies go on the y-axis.
- Be sure that each interval contains the same number of values.
- Be sure to label your axes and give your graph a title.

### Frequency Table

<table>
<thead>
<tr>
<th>Height (m)</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-69.9</td>
<td>III</td>
<td>13</td>
</tr>
<tr>
<td>70-79.9</td>
<td>III</td>
<td>4</td>
</tr>
<tr>
<td>80-89.9</td>
<td>III</td>
<td>0</td>
</tr>
<tr>
<td>90-99.9</td>
<td>II</td>
<td>2</td>
</tr>
<tr>
<td>100-109.9</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>110-119.9</td>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td>120-129.9</td>
<td>I</td>
<td>1</td>
</tr>
</tbody>
</table>
Example 2) The following data shows the player weights below (in lbs.) for the town wrestling team. Complete the frequency table below and then create a histogram for the data using the grid.

- Give your graph a title
- Label both axes
- Make your bars the same width (# of boxes)
- Make your bars touch
- Choose a scale on the y-axis is appropriate

**Player Weights:** 121, 140, 165, 172, 110, 105, 178, 145, 133, 155, 103, 170, 122, 131, 119, 125, 127, 162, 113, 121

<table>
<thead>
<tr>
<th>Interval</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-119</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>120-139</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>140-159</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>160-179</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

**CLASSWORK**

1A) Construct a dot plot on the number line for the following data. Don’t forget to give your graph a title and label its axis.

Heights in inches of 20 students in a class:

53, 60, 61, 63, 64, 65, 65, 65, 66, 66, 67, 67, 68, 69, 70, 70, 71, 71, 73
1B) Now, construct a box plot on the number line for the same data. Don't forget to give your graph a title and label its axis.

Heights in inches of 20 students in a class:

53, 60, 61, 63, 64, 65, 65, 65, 66, 66, 67, 67, 68, 69, 70, 70, 71, 71, 73

Minimum: __________
Quartile 1: __________
Median: __________
Quartile 3: __________
Maximum: __________
Inter-Quartile Range: __________

1C) Describe the shape of the dot plot. ______________________________________

1D) In your opinion, which graph shows a better display of the data set? Why? __________
2A) The following set of data represents the scores on a mathematics quiz:

58, 79, 81, 99, 68, 92, 76, 84, 53, 57, 81, 77, 50, 65, 57, 51, 72, 84, 89

Complete the frequency table and then, on the grid below, create a histogram for the quiz scores. Don't forget your labels etc.

<table>
<thead>
<tr>
<th>Interval</th>
<th>TALLY</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 - 59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - 69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 - 79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 - 89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 - 99</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answer the following questions based on your frequency histogram.

2B) Which quiz score interval was the most frequent?

2C) How many students scored at most 79?

2D) How many students scored a quiz score of at least 80?

2E) What percent of the students scored less than 80? (round your answer to the nearest percent)
Homework - Creating Graphs
Box Plots, Dot Plots and Histograms

1) In class, we looked at the box plot for this situation: A random sample of teenagers, ages 13 and 14, were asked "on average, how many text messages do you send per day?" The results were: 0, 10, 10, 10, 10, 20, 20, 20, 30, 50, 50, 50, 90, 100, 100

a) Create a dot plot for the data:

Text messages sent per day

b) How many teenagers were surveyed? _______

c) Explain how you can determine this using the dot plot. ________________________________

________________________________________

d) Describe the shape of the graph. ______________________________________________________

________________________________________

e) Count the number of dots at 0 and 10. What do these numbers mean? _______

________________________________________

f) What is one conclusion you can draw from this dot plot. ________________________________

________________________________________
2) The data below show the cost of cell phone cases at a local store. Create a box plot for the data. Don’t forget to give your graph a title and label its axis.

$67, $53, $41, $33, $52, $28, $70, $56, $54, $48, $65, $72, $44, $59, $62

Minimum: ____________  Quartile 3: ____________  
Quartile 1: ____________  Maximum: ____________  
Median: ____________  Inter-Quartile Range: ____________

3) Given the data set below, calculate each of the following measures of central tendency and variation.

5, 13, 9, 31, 25, 21, 25, 18, 23, 14, 32, 3, 22, 11, 16

a) Minimum: ____________  
b) Median: ____________  
c) Quartile 1: ____________  
d) Quartile 3: ____________  
e) Inter-Quartile Range: ____________

f) Maximum: ____________  
g) Range: ____________  
h) Mean: ____________  
i) Mode: ____________
4) The scores earned by students on a 100-point Biology test were as follows:

83, 81, 75, 72, 79, 89, 86, 79, 58, 95, 78, 70, 74, 82, 73, 79, 84, 66, 75, 90,
81, 97, 71, 77, 80, 68, 85, 96, 93, 88

A) Complete the frequency table for the biology test scores.

<table>
<thead>
<tr>
<th>Interval</th>
<th>TALLY</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>95 - 99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 - 94</td>
<td></td>
<td></td>
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<tr>
<td>85 - 89</td>
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<td></td>
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<td>80 - 84</td>
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<td></td>
</tr>
<tr>
<td>75 - 79</td>
<td></td>
<td></td>
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<tr>
<td>70 - 74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65 - 69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 - 64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55 - 59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B) Complete the frequency histogram (on the next page) for the biology test scores.

Use the frequency table and frequency histogram (on the next page) to answer the following questions.

C) How many students took the test? __________

D) How many students scored below 70 on the biology test? __________

E) What percent of the students scored below 70 on the biology test? __________
   (round your answer to the nearest percent)

F) What percent of the students scored 90 or above on the biology test? __________
   (round your answer to the nearest percent)

G) What is the mean test score? __________

H) What is the range of the test scores? __________

I) Which test score appeared the most often? __________
Be sure to:

- Give your graph a title
- Label both axes
- Make your bars the same width (# of boxes)
- Make your bars touch
- Choose a scale on the y-axis is appropriate