

Name \_\_\_\_\_

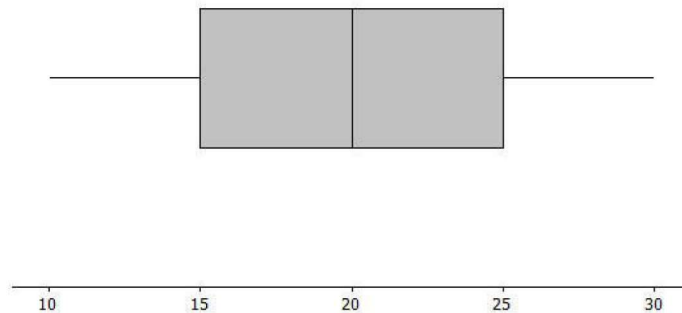
Date \_\_\_\_\_

## Summarizing a Distribution Using a Box Plot

Sulee explained how to make a box plot to her sister as follows:

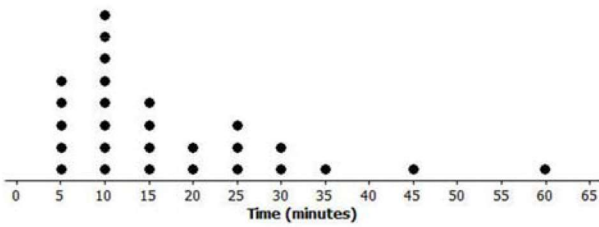
“First you find the smallest and largest values and put a mark halfway between them, and then put a mark halfway between that mark and each end. So, if 10 is the smallest value and 30 is the largest value, you would put a mark at 20. Then another mark belongs half way between 20 and 10, which would be at 15. And then one more mark belongs half way between 20 and 30, which would be at 25. Now, you put a box around the three middle marks and draw lines from the box to the smallest and largest values.”

Here is her box plot. What would you say to Sulee?

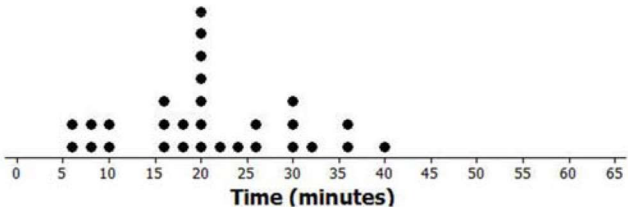


1. Dot plots for the amount of time it took students in Mr. S's and Ms. J's classes to get to school are below

**Mr. S's Class**

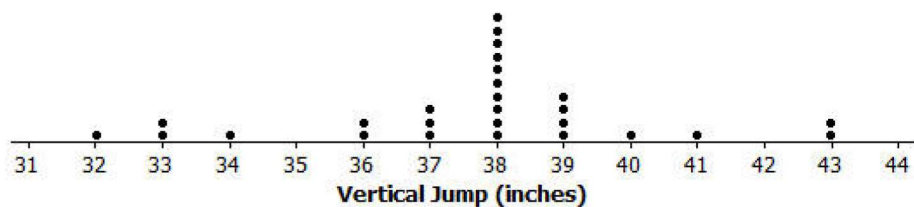


**Ms. J's Class**



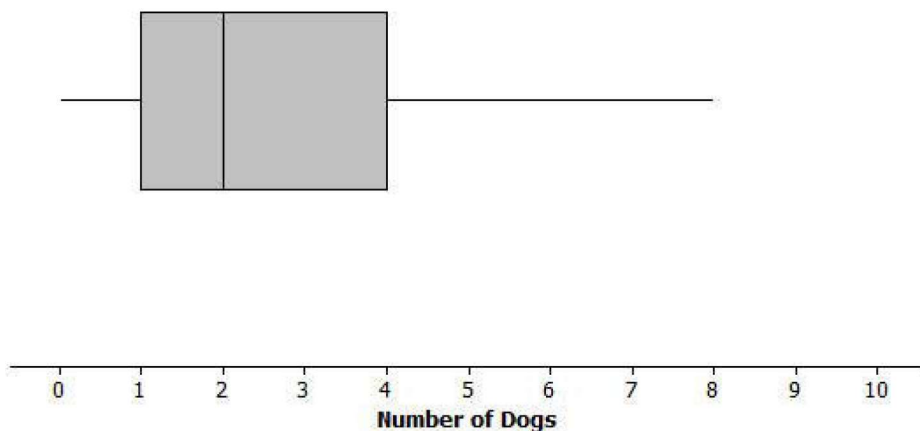
- Make a box plot of the times for each class.
- What is one thing you can see in the dot plot that you cannot see in the box plot? What is something that is easier to see in the box plot than in the dot plot?

2. The dot plot below shows the vertical jump of some NBA players. A vertical jump is how high a player can jump from a standstill. Draw a box plot of the heights for the vertical jumps of the NBA players above the dot plot.



3. The mean daily temperatures in °F for the month of February for a certain city are as follows:  
 4, 11, 14, 15, 17, 20, 30, 23, 20, 35, 35, 31, 34, 23, 15, 19, 39, 22, 15, 15, 19, 39, 22, 23, 29, 26, 29, 29
- Make a box plot of the temperatures.
  - Make a prediction about the part of the United States you think the city might be located. Explain your reasoning.
  - Describe the data distribution of temperature. Include a description of the center and spread.

4. The plot below shows the results of a survey of households about the number of dogs they have. Identify the following statements as true or false. Explain your reasoning in each case.

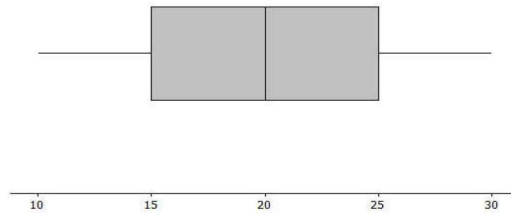


- The maximum number of dogs per house is 8.
- At least  $\frac{1}{2}$  of the houses have 2 or more dogs.
- All of the houses have dogs.
- Half of the houses surveyed have between 2 and 4 dogs.
- Most of the houses surveyed have no dogs.

Sulee explained how to make a box plot to her sister as follows:

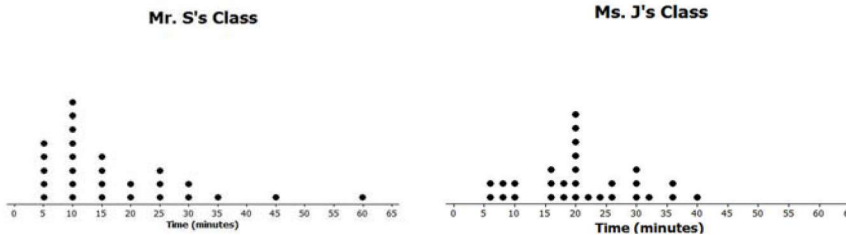
“First you find the smallest and largest values and put a mark halfway between them, and then put a mark halfway between that mark and each end. So, if 10 is the smallest value and 30 is the largest value, you would put a mark at 20. Then another mark belongs half way between 20 and 10, which would be at 15. And then one more mark belongs half way between 20 and 30, which would be at 25. Now, you put a box around the three middle marks and draw lines from the box to the smallest and largest values.”

Here is her box plot. What would you say to Sulee?

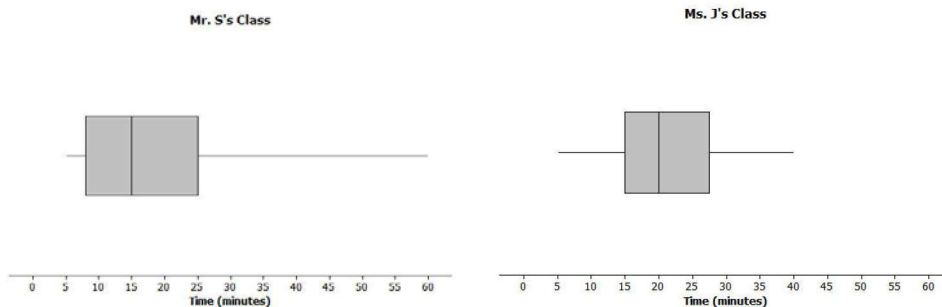


*Sulee is wrong. This is not the correct way to create a box plot. Sulee did not find the median or the quartiles using the data values; she just divided up the length between the smallest and largest numbers.*

1. Dot plots for the amount of time it took students in Mr. S's and Ms. J's classes to get to school are below.



a. Make a box plot of the times for each class.

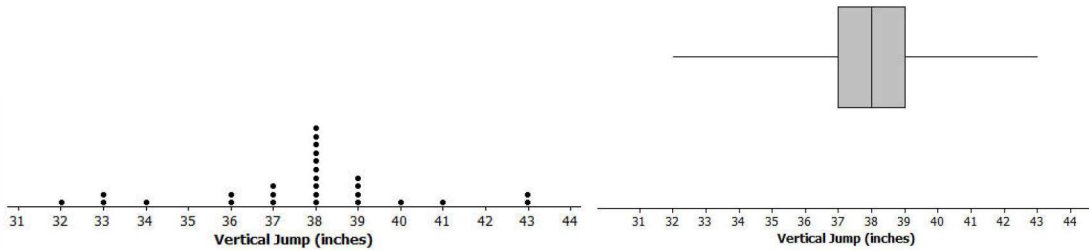


*Mr. S five summary values: 5, 10, 15, 25, 60 and Ms. J five summary values: 5, 15, 20, 27.5, 40*

- b. What is one thing you can see in the dot plot that you cannot see in the box plot? What is something that is easier to see in the box plot than in the dot plot?

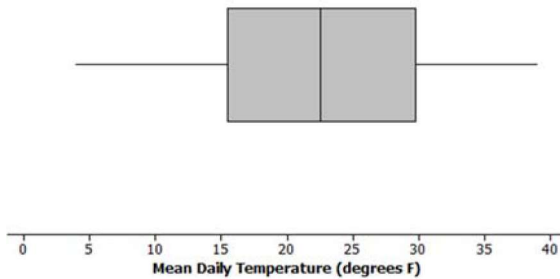
*The dot plot shows individual times which you cannot see in the box plot. The box plot shows the location of the median and of the lower and upper quartiles.*

2. The dot plot below shows the vertical jump of some NBA players. A vertical jump is how high a player can jump from a standstill. Draw a box plot of the heights for the vertical jumps of the NBA players above the dot plot.



*Five summary values: 32, 37, 38, 39, 43*

3. The mean daily temperatures in °F for the month of February for a certain city are as follows:  
4, 11, 14, 15, 17, 20, 30, 23, 20, 35, 35, 31, 34, 23, 15, 19, 39, 22, 15, 15, 19, 39, 22, 23, 29, 26, 29, 29
- a. Make a box plot of the temperatures.



*5-summary values: 4, 16, 22.5, 29.5, 39*

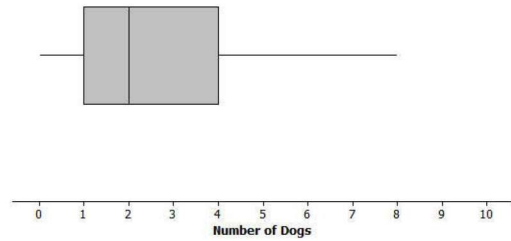
- b. Make a prediction about the part of the United States you think the city might be located. Explain your reasoning.

*Answers will vary: The city was probably somewhere in the northern states, either Midwest or northeast or maybe Montana or Wyoming, because the temperatures are pretty cold.*

- c. Describe the data distribution of temperature. Include a description of the center and spread.

*The IQR is  $29.5^\circ - 16^\circ$ , or  $13.5^\circ$ . Half of temperatures were near the middle between  $16^\circ$  and  $29.5^\circ$ . The median is  $22.5^\circ$ . A quarter of the temperatures are less than 16 but greater than or equal to  $4^\circ$ . A quarter of the temperatures are greater than  $29.5^\circ$  and less than or equal to  $39^\circ$ .*

4. The plot below shows the results of a survey of households about the number of dogs they have. Identify the following statements as true or false. Explain your reasoning in each case.



- a. The maximum number of dogs per house is 8.  
*True because the line segment at the top goes to 8.*
- b. At least  $\frac{1}{2}$  of the houses have 2 or more dogs.  
*True because 2 is the median.*
- c. All of the houses have dogs.  
*False because the lower line segment starts at 0 so at least one household does not have a dog as a pet.*
- d. Half of the houses surveyed have between 2 and 4 dogs.  
*False because only about 25% of the houses would have between 2 and 4 dogs.*
- e. Most of the houses surveyed have no dogs.  
*False because at least  $\frac{3}{4}$  of those surveyed had 1 or more dogs.*