

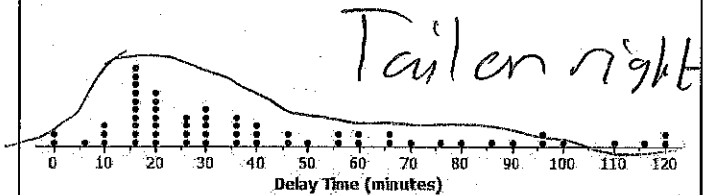
Lesson 1: Distributions and Their Shapes

Exercises: VOCAB: Symmetric means same on both sides. Skewed means clustered on one side.

Transportation officials collect data on flight delays (the number of minutes past the scheduled departure time that a flight takes off).

Consider the dot plot of the delay times for sixty BigAir flights during December 2012.

Dot Plot of December Delay Times



1. What do you think this graph is telling us about the flight delays for these sixty flights?

Most flights are delayed for 10-30 minutes.

2. Can you think of a reason why the data presented by this graph provide important information? Who might be interested in this data distribution?

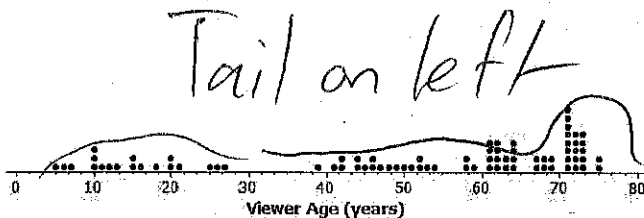
Important for travelers & airline executives

3. Based on your previous work with dot plots, would you describe this dot plot as representing a symmetric or a skewed data distribution? (Recall that a skewed data distribution is not mound shaped.) Explain your answer.

Skewed right

A random sample of eighty viewers of a television show was selected. The dot plot below shows the distribution of the ages (in years) of these eighty viewers.

Dot Plot of Viewer Age



4. What do you think this graph is telling us about the ages of the eighty viewers in this sample?

Most are old, but a few young people

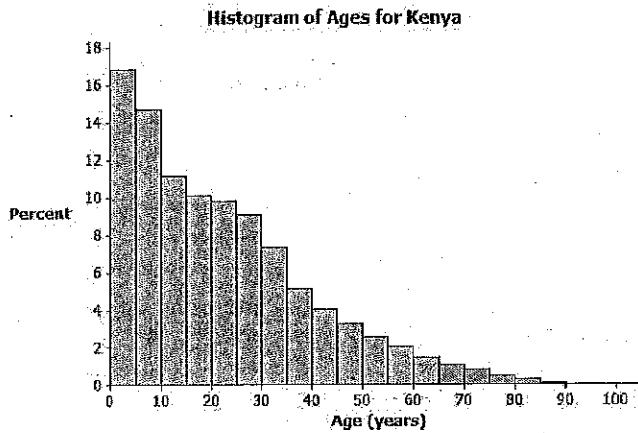
5. Can you think of a reason why the data presented by this graph provide important information? Who might be interested in this data distribution?

Important for network executives

6. Based on your previous work with dot plots, would you describe this dot plot as representing a symmetric or a skewed data distribution? Explain your answer.

Skewed left

The following histogram represents the age distribution of the population of Kenya in 2010.



7. What do you think this graph is telling us about the population of Kenya?

Most Kenyans are young.

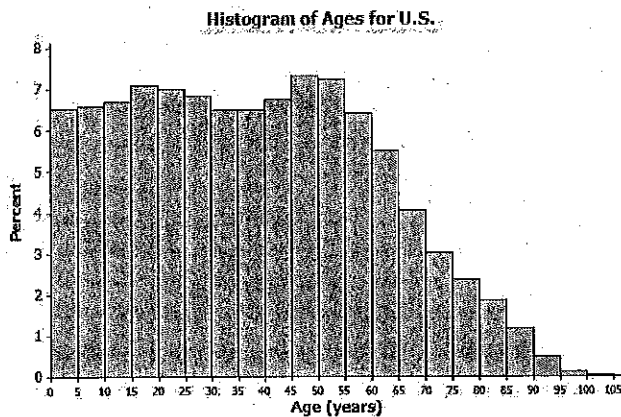
8. Why might we want to study the data represented by this graph?

To understand health/nutrition outcomes

9. Based on your previous work with histograms, would you describe this histogram as representing a symmetrical or a skewed distribution? Explain your answer.

Skewed right.

The following histogram represents the age distribution of the population of the United States in 2010.



10. What do you think this graph is telling us about the population of the United States?

People live until their 60's or so before they start dying.

11. Why might we want to study the data represented by this graph?

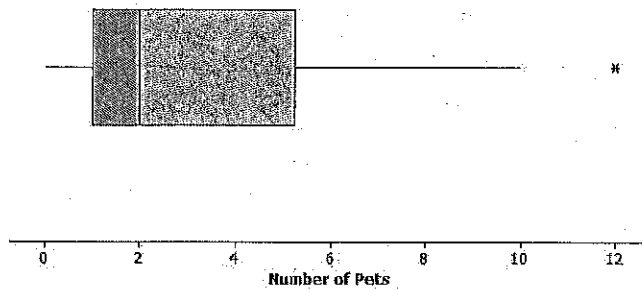
To understand healthcare/retirement costs.

12. Write a few sentences comparing and contrasting the histograms for Kenya and the U.S.

More Kenyans are young. The data is more skewed.

Thirty students from River City High School were asked how many pets they owned. The following box plot was prepared from their answers.

Boxplot of Number of Pets



13. What does the box plot tell us about the number of pets owned by the thirty students at River City High School?

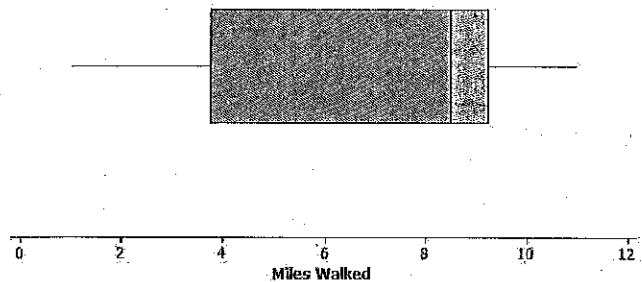
Most students own a few pets. 50% own 2 or less.

14. Why might understanding the data behind this graph be important?

Not sure. Maybe it's for a class project. Make something up.

Twenty-two juniors from River City High School participated in a walkathon to raise money for the school band. The following box plot was constructed using the number of miles walked by each of the twenty-two juniors.

Boxplot of Miles Walked for Juniors



15. What do you think the box plot tells us about the number of miles walked by the twenty-two juniors?

Half walked ~~at~~ more than 8, half walked less.

16. Why might understanding the data behind this graph be important?

To estimate \$ raised? Encourage kids to walk more?

17. Why does it not make sense to compare and contrast these two box plots?

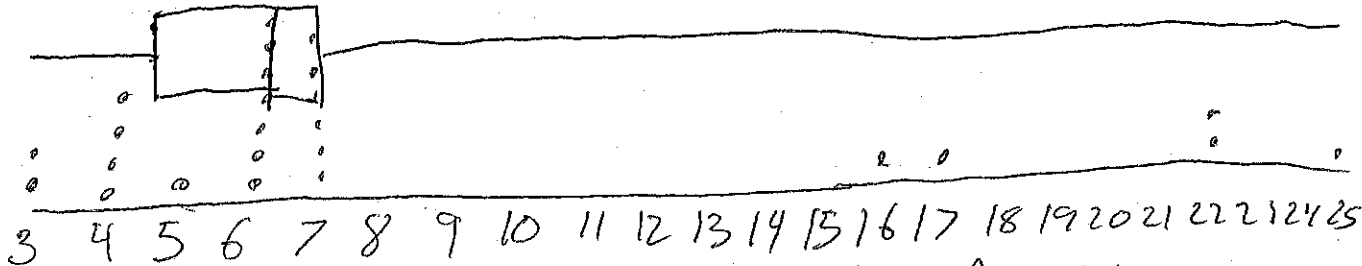
They measure different data.

Problem Set

1. Twenty-five people were attending an event. The ages of the people are as follows:

3, 3, 4, 4, 4, 4, 5, 6, 6, 6, 6, 6, 6, 6, 7, 7, 7, 7, 7, 7, 16, 17, 22, 22, 25.

a. Create a dot plot and a box plot of the ages.



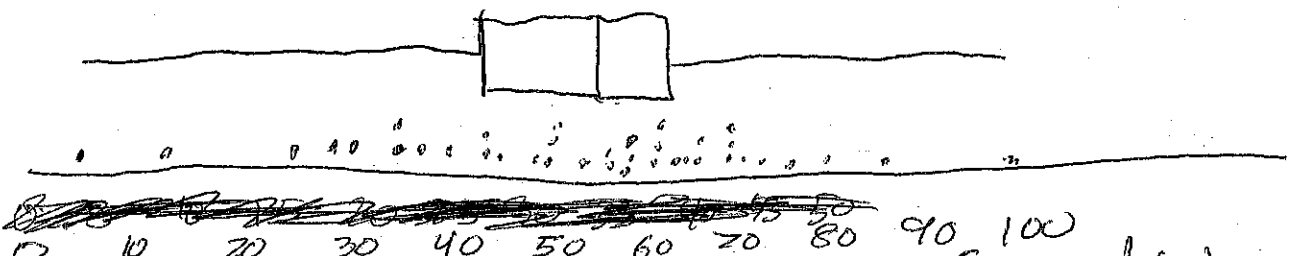
- b. Would you describe your graph as symmetrical or skewed? Explain your choice. *Skewed right*
- c. Calculate the mean, median, and mode age. *Mean = 8.52, Med = 6, Mode = 6*
- d. Identify a typical age of the twenty-five people. *6*
- e. What event do you think the twenty-five people were attending? Use your graphs to justify your conjecture.

All Ketchers Soccer camp

2. A different forty people were also attending an event. The ages of the people are as follows:

6, 13, 24, 27, 28, 32, 32, 34, 38, 42, 42, 43, 48, 49, 49, 49, 51, 52, 52, 53, 53, 53, 54, 55, 56, 57, 57, 60, 61, 61, 62, 66, 66, 66, 68, 70, 72, 78, 83, 97.

a. Create a dot plot and a box plot of the ages.



- b. Would you describe your graph of ages as symmetrical or skewed? Explain your choice. *Symmetrical*
- c. Calculate the mean, median, and mode age. *Mean = 51.48, Med = 53, Modes = 53, 66, 49*
- d. Identify a typical age of the forty people. *53*
- e. What event do you think the forty people were attending? Use your histogram to justify your conjecture.

Saturday market. Mostly adults, some kids & old people

f. How would you describe the differences in the two distributions?

One is symmetric, one is skewed right