

NAME: _____

Sept. 30th - Day 6 Notes

UNIT 7 • WORKING WITH DATA

Day 54

Day 54 Guided Practice

How to Make a Box-and-Whisker Plot

Use the following data to create a box-and-whisker plot.

Here are the scores of a recent math test taken by 15 students:

18, 27, 34, 52, 54, 59, 61, 68, 78, 82, 85, 87, 91, 93, 100

\uparrow LQ H \uparrow UQ

1. Find the median of the data. (The data is already in order from least to greatest!)

① Median: 68

2. Find the lower quartile. To do this, look at only the data items to the left of the median. Find the middle value.

② Lower quartile: 52

3. Find the upper quartile. To do this, look at only the data items to the right of the median. Find the middle value.

③ Upper quartile: 87

4. Find the minimum (the smallest number in the data set).

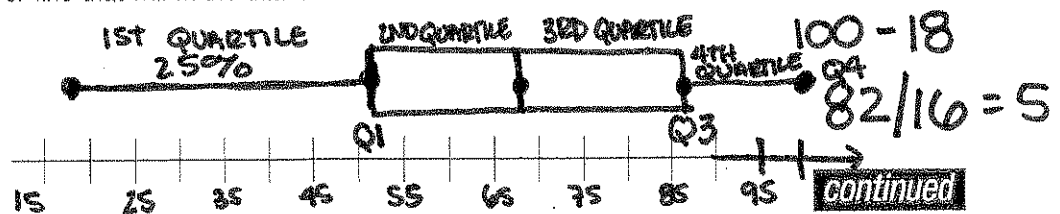
④ Minimum: 18

5. Find the maximum (the largest number in the data set).

⑤ Maximum: 100

QUARTILE

6. Make a number line that will fit the data above—it has to have room for the minimum and the maximum.



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7. Plot the five points that you found on your number line. You should put them far enough above the number line so that you will have room to make a box around the middle three.

8. Draw a box above your number line, starting at the lower quartile and finishing at the upper quartile. Draw a vertical line through the median that touches the top and bottom of the box.

9. Draw a line from the lower quartile to the minimum. Draw another line from the upper quartile to the maximum. These are your whiskers.

10. Now use your box-and-whisker plot to answer the following questions.

a. What was the median score of the test? 68

b. Between which two scores did the middle 50% of the test scores occur? 52 - 87

c. What is the range of the data? 100 - 18 = 82

Day 6 PRACTICE

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Day 54 Guided Practice

Five-Number Summary and Box-and-Whisker Plots I

Use the data from each scenario to fill out the charts and answer the questions.

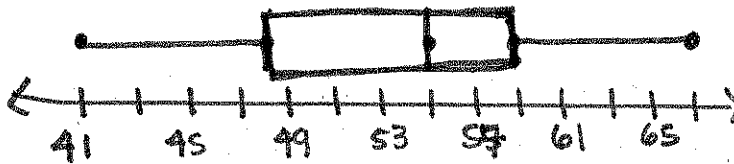
1. A meteorologist collects noontime temperatures for the month of April. The Fahrenheit temperatures recorded were: 45, 50, 54, 60, 62, 41, 48, 57, 59, 55, 55, 47, 67, and 56.

41 45 47 48 50 54 55 | 55 55 57 59 60 62 67
↑

- a. Complete the five-number summary for the data above.

Minimum (min)	41
Lower quartile (Q ₁)	48
Median (M)	55
Upper quartile (Q ₃)	59
Maximum (max)	67

- b. Make a box-and-whisker plot from the data.



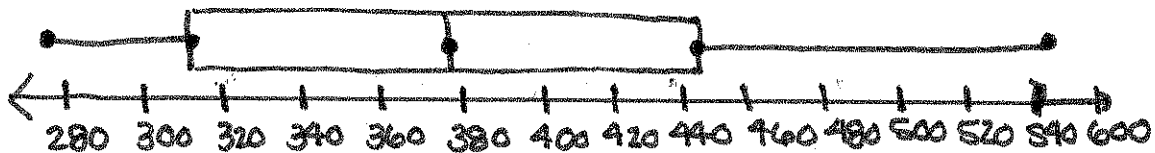
2. Nutritionists hoping to help their clients make better food choices collected data on the calories found in fast-food sandwiches that cost under \$5.00. Here is what they found: 279, 300, 341, 450, 378, 325, 416, 511, 387, 349, 544, 442, and 291.

279 291 300 325 341 349 378 387
416 442 450 511 544

- a. Complete the five-number summary for the data above

Minimum (min)	279
Lower quartile (Q ₁)	312.5
Median (M)	378
Upper quartile (Q ₃)	446
Maximum	544

- b. Make a box-and-whisker plot from the data.



continued

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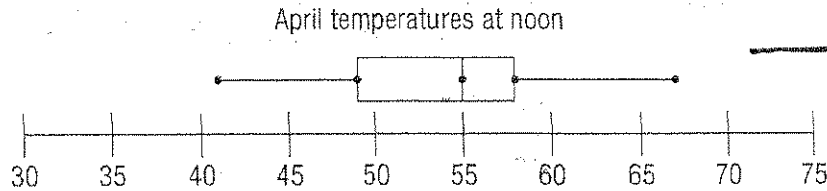
Day 55

Day 55 Guided Practice

Describing Box-and-Whisker Plots I

Use the box plots to answer the questions.

1. The box plot below shows noontime temperatures for the month of April.



a. Where is the center of the data? 55

b. What is the spread of the data? $67 - 41 = 26$

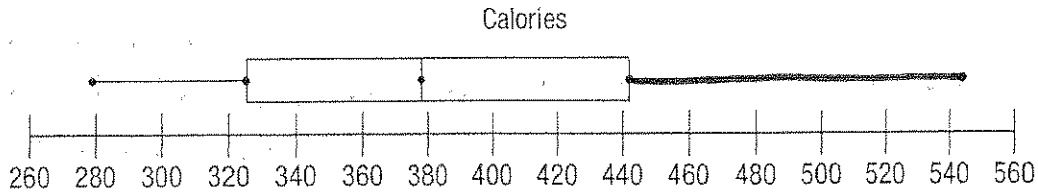
c. What is the shape of the box-and-whisker plot?

mound

d. What do the box and whiskers show about temperatures in April?

temps never went below 41°. Range of temps, sometimes cold (40s), sometimes warm (upper 60s)

2. The box plot below shows calories found in fast-food sandwiches that cost less than \$5.



a. Where is the center of the data? 375

b. What is the spread of the data? $545 - 280 = 265$

c. What is the shape of the box-and-whisker plot?

SKewed RIGHT

d. What do the box and whiskers show about the calories in fast-food sandwiches?

25% of sandwiches are more than 440 calories
75% is less than 440 calories

continued

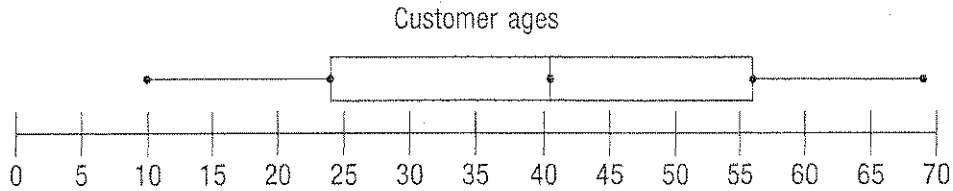
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Day 6 Practice

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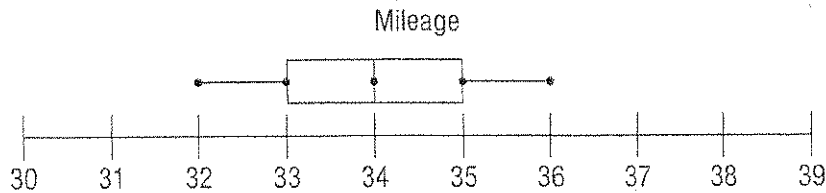
Day 55

3. The box plot below shows the ages of customers who bought snicker-doodles at Carl's Cookies.



- a. Where is the center of the data? ABOUT 41
- b. What is the spread of the data? $69 - 10 = 59$
- c. What is the shape of the box-and-whisker plot?
mound
- d. What does the box-and-whisker plot show about who eats snicker-doodles?
All ages → from 10 to 70. MEDIAN AGE IS 41

4. The box plot below shows the miles per gallon for 20 different models of cars.



- a. Where is the center of the data? 34
- b. What is the spread of the data? $36 - 32 = 4$
- c. What is the shape of the box-and-whisker plot?
mound
- d. What does the box-and-whisker plot tell you about the gas mileage for these cars?
NOT A BIG RANGE. MEDIAN IS AROUND 34 MPG.

HOW TO MAKE A BOX PLOT IN YOUR CALCULATOR

Graphing Calculator **ACTIVITY** Use after Lesson 13.8

@HomeTutor
classzone.com
Keystrokes

13.8 Draw Box-and-Whisker Plots

QUESTION How can you use a graphing calculator to make a box-and-whisker plot?

EXAMPLE Make a box-and-whisker plot

REPTILE SPECIES The number of known reptile species per 10,000 square kilometers in the countries of Asia (excluding the Middle East) and of Central America, South America, and the Caribbean are listed below. Make box-and-whisker plots of the numbers of species:

Asia: 36, 26, 49, 11, 32, 35, 27, 58, 91, 26, 8, 8, 12, 12, 23, 110, 4, 51, 41, 41, 62, 350, 77, 18, 81, 23, 18, 59

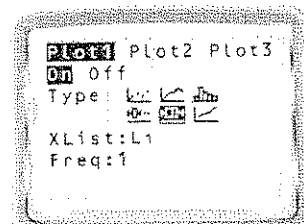
Central America, South America, and the Caribbean: 81, 125, 47, 69, 57, 107, 77, 73, 35, 123, 69, 116, 87, 37, 45, 53, 20, 124, 126, 35, 73, 60, 64

STEP 1 Enter the data **STAT EDIT**

Enter the data for Asia into List 1. Enter the data for Central America, South America, and the Caribbean into List 2.

STEP 2 Select box-and-whisker plot

Go to the STAT PLOT screen and select the box-and-whisker plot for both Plot 1 and Plot 2. The Xlist for Plot 1 should be L_1 , so that it displays the data from List 1. The Xlist for Plot 2 should be L_2 , so that it displays the data from List 2. Make sure both plots are on.

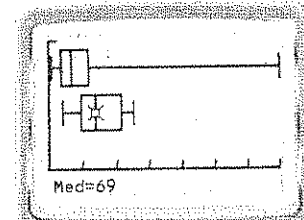


STEP 3 Set the viewing window

Press ZOOM 9 to set the window so that it shows all of the data.

STEP 4 Graph

Press GRAPH . Use the trace feature to examine the box-and-whisker plots more closely. Notice that the graphing calculator refers to the lower quartile as Q_1 and the upper quartile as Q_3 .



DRAW CONCLUSIONS

- REPTILE SPECIES** Compare the number of reptile species per 10,000 square kilometers in the countries of Central America, South America, and the Caribbean with the number in Asia.
- BIRD SPECIES** The number of threatened bird species per 10,000 square kilometers in the countries of two regions are listed below. Make box-and-whisker plots of the data and compare the data for the two regions.

Middle East and Northern Africa: 13, 8, 11, 14, 12, 8, 4, 3, 5, 2, 11, 5, 11, 7, 6, 14, 4, 13

North and South America: 5, 50, 41, 27, 103, 18, 64, 53, 3, 26, 64, 2, 11, 22