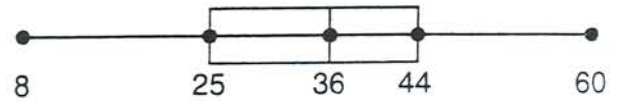


# Why Didn't the Physics Teacher Marry the Biology Teacher?

Find each correct answer at the bottom of the page and write the letter for that answer under it.

**1** For the box-and-whisker plot at the right, give the following:

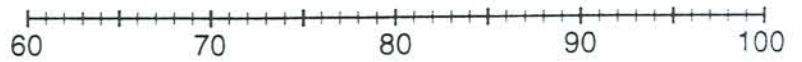
- O. the first quartile
- E. the second quartile (median)
- T. the third quartile
- H. the range



**2** Arrange these scores in order from smallest to largest. Draw a box-and-whisker plot of the data under the number line at the right. Give the following:

TEST SCORES						
82	86	89	84	78	82	92
95	77	69	98	95	63	73

- A. the median
- I. the first quartile
- E. the third quartile
- C. the range
- R. percent of the scores between the first and third quartiles



**3** Arrange each set of heights in order from smallest to largest. Draw two box-and-whisker plots, one for boys and one for girls, under the number line at the right.

Heights of boys (in.): 64, 61, 66, 64, 58, 63, 68, 64, 60, 57, 65, 63, 69, 64, 64, 68, 61, 65  
 Heights of girls (in.): 63, 60, 67, 62, 58, 63, 68, 59, 62, 65, 56, 63, 59, 62, 58

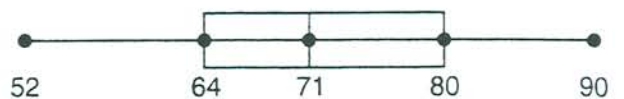
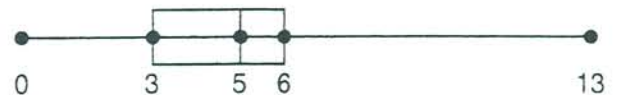
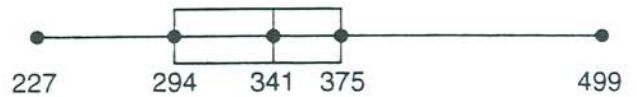
Give the following:

- T. the median for boys
- E. the first quartile for boys
- S. the third quartile for boys
- Y. the median for girls
- R. the first quartile for girls
- H. the third quartile for girls



**4** Match each description with the most reasonable box-and-whisker plot. Look for the median of this plot in the answer spaces. Write the exercise letter in that box.

- N. Season scores of a baseball team
- S. Resting heart rates (beats per minute)
- W. Prices of 25-inch TV sets (\$)
- M. Ages at a Boy Scout meeting



64	52	92	59	36	89	341	83	65	38	5	25	60	35	63	61	13	77	71	44	50	62
----	----	----	----	----	----	-----	----	----	----	---	----	----	----	----	----	----	----	----	----	----	----

This data represents the number of minutes a group of students spends on math homework each night:

45, 50, 60, 65, 45, 10, 80, 70, 80, 120,  
200, 130, 115, 75, 50, 60, 100

First we put the data in ascending order, dividing it in half

10, 45, 45, 50, 50, 60, 60, 65, Lower half

70,

75, 80, 80, 100, 110, 115, 120, 200 Upper half

The range is 190 ( $200 - 10 = 190$ )

The median is 70 (the middle number)

The lower quartile is 50 (the median of the lower half)

The upper quartile is 105 (the median of the upper half)

The interquartile range is 55 ( $105 - 50 = 55$ )

The outlier is 200 because  $1.5(55) = 82.5$  and 200 is more than 82.5 units from the upper quartile (105)

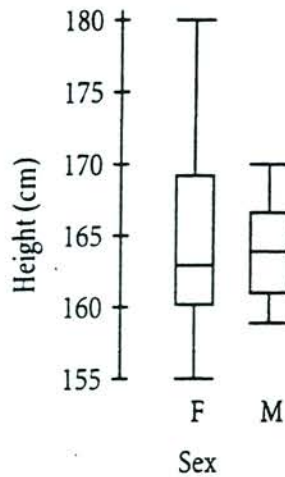
10 is not an outlier because it is closer than 82.5 units from the lower quartile (50)

# Measures of Variation

1. **Range** – the difference between the greatest and the least numbers in a set of data
2. **Upper Quartile** – the median of the upper half of the data
3. **Lower Quartile** – the median of the lower half of the data
4. **Interquartile Range** – the range of the middle half of the data (found by subtracting the lower quartile from the upper quartile)
5. **Outlier** – an extreme value, specifically one that is more than 1.5 times the interquartile range from the upper or lower quartile

## Kids' Heights

This is a boxplot of some height data for some middle-school students. Are there more girls or boys in this sample?



## Kids' Heights

Below is a stem-and-leaf plot of some height data for some middle-school students. The heights are in centimeters.

### Heights

```

15 | 5999
16 | 00111122444566799
17 | 0015
18 | 0
    
```

example: "16 | 1" means 161 cm

What is the name of the tallest student?

## Kids' Heights

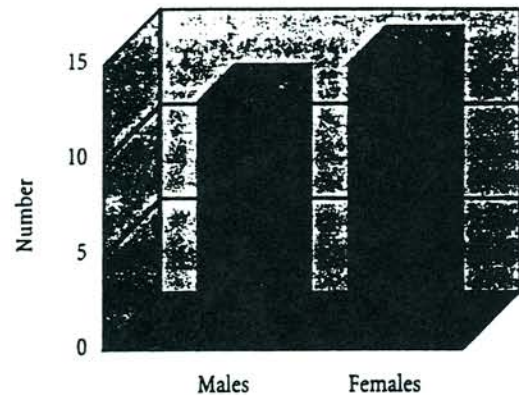
Here is some height data for 26 middle-school students:

Name	Height (cm)	Name	Height (cm)
Alice	155	Nathan	159
Blaise	161	Oscar	166
Charlotte	167	Penelope	180
Dwayne	170	Quincy	166
Emma	160	Ravi	161
Felicia	165	Sofia	171
Gustavo	169	Thalia	159
Hazel	162	Ursula	175
Isaac	164	Victor	169
Julietta	164	Wayne	161
Kyle	159	Xanthia	162
Lobelia	160	Yvonne	170
Marianela	161	Zoroaster	164

Which group has the bigger spread in heights—the females or the males?

## Kids' Heights

Here is a column chart that shows data about a height study of some middle-school students:

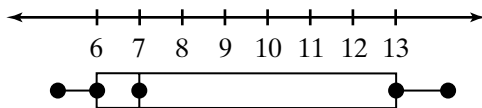


What is the most common height of students in the study?

## Enrichment 12-2 Plot the Answer

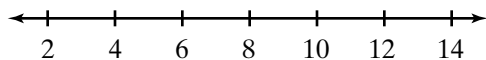
To answer each of the following questions, make a box and whisker plot for the given set of data. Then write the first quartile, the median, and the third quartile in the answer boxes.

**Example**



1. What was the year of the birth of the famous mathematician Pythagoras.

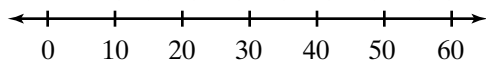
Data: 6, 10, 2, 7, 6, 12, 8, 6, 4, 13, 2, 6



B.C.

2. The Caspian Sea is the largest lake in the world. What is its area?

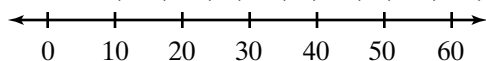
Data: 38, 7, 50, 17, 11, 39, 25, 55, 8, 27, 42, 5, 37, 57, 46, 23



,    mi<sup>2</sup>

3. The Pacific Ocean, the world's largest, is also the deepest. What is the average depth of the Pacific Ocean?

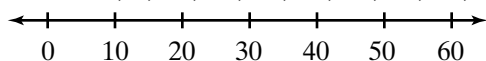
Data: 26, 53, 32, 0, 33, 1, 13, 1, 36, 34, 41, 0



,    ft

4. The greatest recorded snowfall in the United States in a single year fell at Mount Rainier, Washington, in 1971–1972. What was the total amount of snow that fell?

Data: 58, 9, 14, 33, 60, 12, 15, 37, 59, 13, 60, 42, 40, 7, 12, 4



,      in.

# Stem and Leaf Plots

Name \_\_\_\_\_

The weights of all of the babies born at Infantville Hospital on January 13th, 1995 were recorded in ounces as follows: 101, 128, 112, 105, 96, 88, 132, 139, 97, 115, 105, 147, 138, 96, 122, 133, 107, 122, 129, 111, 119, 122, 136, 148, 125, 139 and 124.

Stem	Leaf

- Put the data in the stem and leaf plot.
- Use the stem and leaf plot to name the value repeated three times. \_\_\_\_\_
- Which three values are repeated twice?  
\_\_\_\_\_
- Were most babies born below or above 120 ounces? \_\_\_\_\_
- Are there more values with a stem of 12 or a stem of 13? \_\_\_\_\_
- Which stem has three values? \_\_\_\_\_

The ages of all the guests at Ellie's 40th Birthday Bash were recorded as follows: 52, 41, 26, 38, 40, 62, 55, 43, 48, 57, 39, 37, 45, 70, 56, 64, 29, 50, 61, 73, 28, 44, 53, 41, 55, 67, 42, 36, 26, 35, 40, 53, 63, 26 and 41.

- Put the data in the stem and leaf plot.
- How many leaves does the stem 5 have?  
\_\_\_\_\_
- How many times does the age 64 appear?  
\_\_\_\_\_
- Which age occurs more frequently, 55 or 26? \_\_\_\_\_
- Which stem has the most values?  
\_\_\_\_\_
- Which stems have 5 values?  
\_\_\_\_\_
- Were most of the guests younger or older than 50? \_\_\_\_\_
- Which values appear more than once? \_\_\_\_\_

Stem	Leaf

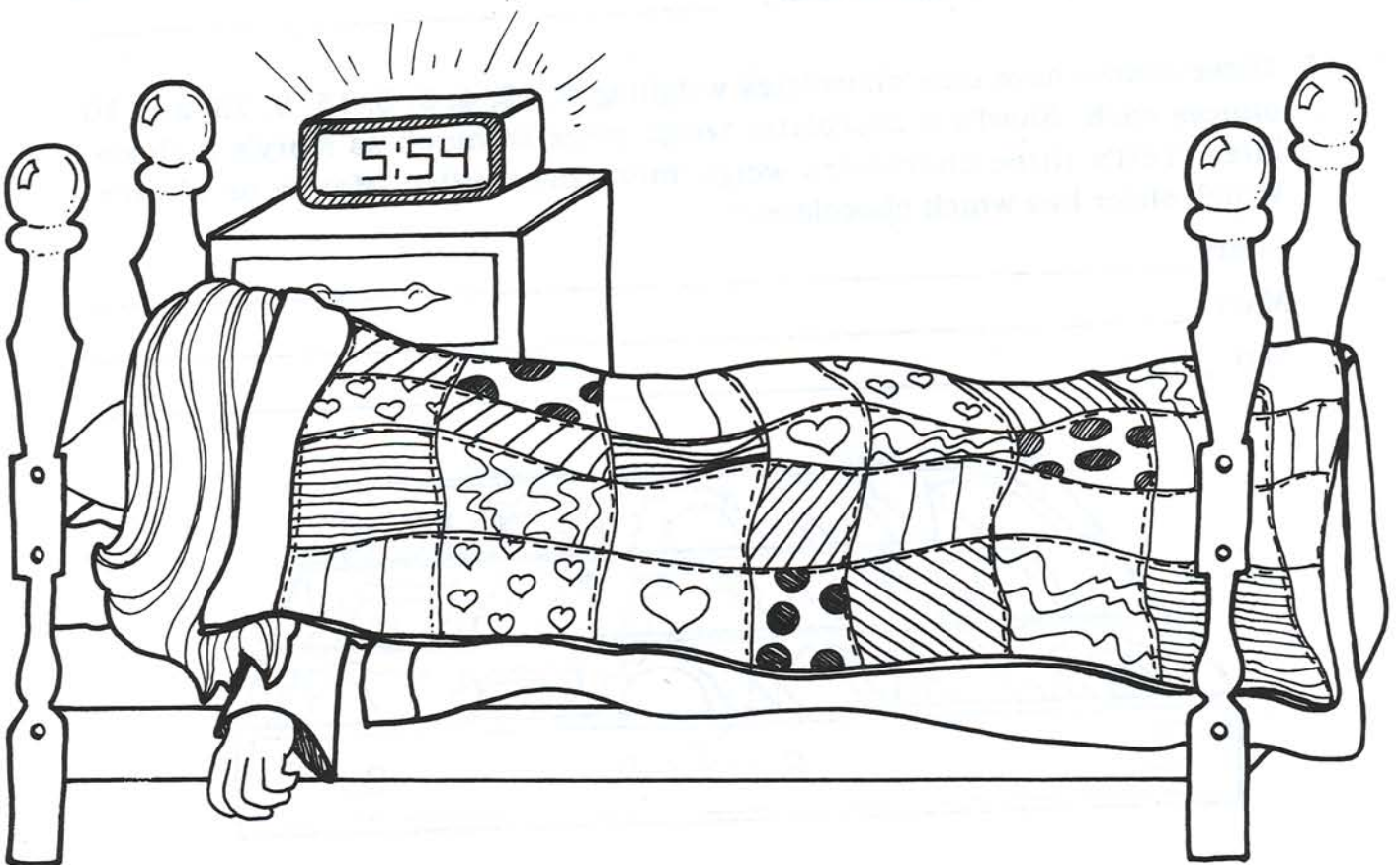
## Tiny Teasers

1. Mrs. Fashion wanted to order a new wardrobe from her favorite mail order catalog. Unfortunately, she discovered her dog, Button, had torn several pages from her catalog. Mrs. Fashion could not find pages 35, 36, 54, 55, 103, and 104. How many pieces of paper did Button remove? \_\_\_\_\_

2. If it takes 6 people 4 days to dig a ditch that's 10 feet long, how long will it take 3 people to dig a ditch 5 feet long? \_\_\_\_\_

3. A duck family is crossing the street. There are 2 ducks in front of a duck, 2 ducks behind a duck, and a duck in between 2 ducks. How many ducks are there altogether? \_\_\_\_\_

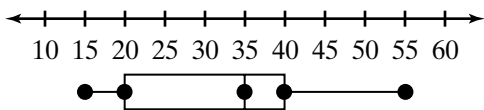
4. How many times in 24 hours will a digital clock read the same forwards and backwards? Use this space to write out the possibilities.



## Practice 12-2 Box-and-Whisker Plots

Use the box-and-whisker plot to answer each question.

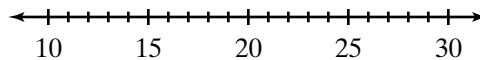
Weekly Mileage Totals, 24 Runners



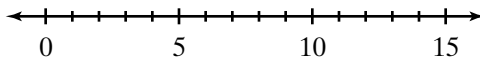
1. What is the highest weekly total? \_\_\_\_\_ the lowest? \_\_\_\_\_
2. What is the median weekly total? \_\_\_\_\_
3. What percent of runners run less than 40 miles a week? \_\_\_\_\_
4. How many runners run less than 20 miles a week? \_\_\_\_\_

Make a box-and-whisker plot for each set of data.

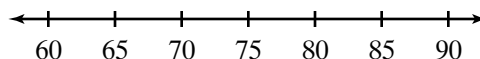
5. 16 20 30 15 23 11 15 21 30 29 13 16



6. 9 12 10 3 2 3 9 11 5 1 10 4 7 12 3 10

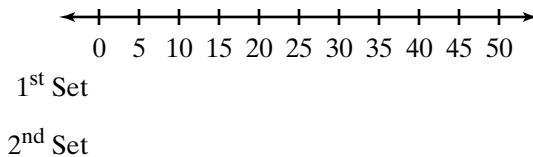


7. 70 77 67 65 79 82 70 68 75 73 69 66  
70 73 89 72

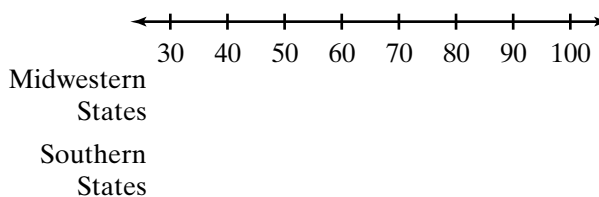


Use box-and-whisker plots to compare data sets. Use a single number line for each comparison.

8. 1st set: 7 12 25 3 1 29 30 7 15 2 5  
10 29 1 10 30 18 8 7 29  
2nd set: 37 17 14 43 27 19 32 1 8 48  
26 16 28 6 25 18



9. Area in 1,000 mi<sup>2</sup>  
midwestern states:  
45 36 58 97 56 65 87 82 77  
southern states:  
52 59 48 52 42 32 54 43 70 53 66



## **Reteaching 12-2 Box-and-Whisker Plots**

Make a box-and-whisker plot for the data set.

**Step 1:** First list the data in order from least to greatest. Find the median.

24 28 34 36 42 | 45 48 52 61 63

Since there is an even number of percents (10), there are two middle numbers. Add them and divide by 2.

$$\frac{42 + 45}{2} = \frac{87}{2} = 43.5 \quad \text{The median is 43.5.}$$

Percent of Federally Owned Land in Ten Western States				
45%	24%	52%	61%	28%
42%	34%	48%	63%	36%

**Step 2:** Find the upper and lower quartiles.

The lower quartile is the median of the lower half.

24 28 34 36 42

The lower quartile is 34.

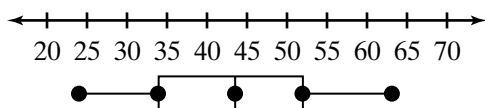
The upper quartile is the median of the upper half.

45 48 52 61 63

The upper quartile is 52.

**Step 3:** Draw a number line. Mark the least and greatest values, the median, and the quartiles. Draw a box from the first to the third quartiles. Draw whiskers from the least and greatest values to the box.

The data range from 24 to 63. A scale of 5 from 20 to 70 would have 11 marks.



**Make a box-and-whisker plot for each data set.**

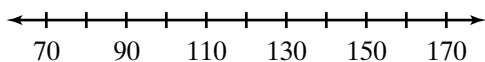
1. Area in 1,000 mi<sup>2</sup> of 13 western states

122	164	71	98	84	147	114
111	98	85	104	71	77	

median: \_\_\_\_\_

lower quartile: \_\_\_\_\_

upper quartile: \_\_\_\_\_



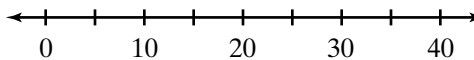
2. Percent of area that is inland water for 11 northeastern states.

13%	4%	26%	4%	32%	13%
15%	3%	21%	7%	21%	

median: \_\_\_\_\_

lower quartile: \_\_\_\_\_

upper quartile: \_\_\_\_\_



# Stem-and-Leaf Plots

This data represents the number of minutes a group of students spends on math homework each night:

45      50      60      65      45      10      82  
70      81      125      200      110      85      89  
115      78      50      60      100

First we put the data in ascending order:

10, 45, 45, 50, 55, 60, 60, 65, 70,  
78, 81, 82, 85, 89, 100, 110, 115, 125, 200

Number of Minutes Spent on Homework

Stem (tens)	Leaf (ones)
1	0
4	5,5
5	0,5
6	0, 0, 5
7	0, 8
8	1, 2, 5, 9
10	0
11	0, 5
12	5
20	0

# Stem-and-Leaf Plots

This data represents the ages of the members of the *Santa Clarita Cat Lovers Club*:

12	32	99	8	13	15	24
10	60	54	66	100	3	18
22	33	37	78	44	21	24

Make a stem-and-leaf plot representing this data.

First we put the data in ascending order:

3, 8, 10, 12, 13, 15, 18, 21, 22, 24, 24, 32, 33, 37, 44, 54, 60, 66, 78, 99, 100

Ages of the Members of the S.C. Cat Lovers Club

Stem (tens)	Leaf (ones)
0	3, 8
1	0, 2, 3, 5, 8
2	1, 2, 4, 4
3	2, 3, 7
4	4
5	4
6	0, 6
7	8
9	9
10	0