

Lesson 1.1 • Bar Graphs and Dot Plots

Name _____ Period _____ Date _____

1. This table shows the heights of the ten tallest mountains in the world.

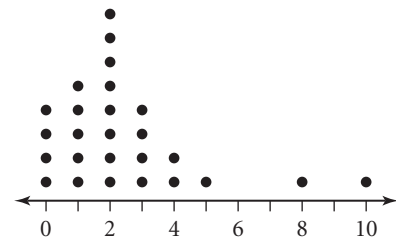
Mountain Heights

ID	Mountain, location	Height (ft)	ID	Mountain, location	Height (ft)
1	Everest, Nepal/Tibet	29,035	6	Lhotse II, Nepal/Tibet	27,560
2	K2, Kashmir	28,250	7	Dhaulagiri I, Nepal	26,810
3	Kanchenjunga, India/Nepal	28,208	8	Manaslu I, Nepal	26,760
4	Lhotse I, Nepal/Tibet	27,923	9	Cho Oyu, Nepal/Tibet	26,750
5	Makalu I, Nepal/Tibet	27,824	10	Nanga Parbat, Kashmir	26,660

(The World Almanac and Book of Facts 2004, p. 488)

- Find the minimum, maximum, and range of the data.
- Construct a bar graph for this data set. Use the ID numbers to identify the mountains.

2. The students in one social studies class were asked how many brothers and sisters (siblings) they each have. The dot plot here shows the results.

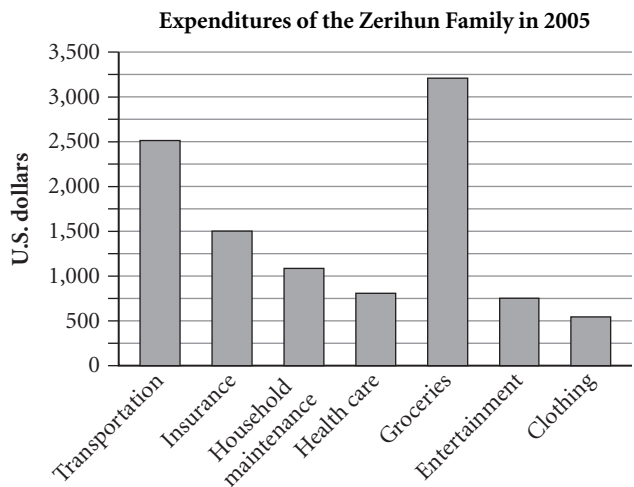


- How many of the students have six siblings?
- How many of the students have no siblings?
- How many of the students have three or more siblings?

3. This table shows approximately how long it took members of Abdul's math class to complete a cross-number puzzle.

Time (min)	2	3	5	6	8	10
Number of students	1	2	6	8	3	1

- Show this data on a dot plot.
 - What is the range of the data?
4. The bar graph shows how much money the Zerihun family spent on various goods and services during 2005.
- On what did the Zerihun family spend the least amount of money?
 - About how much did they spend on insurance?
 - About how much more did they spend for groceries than for transportation?



Lesson 1.2 • Summarizing Data with Measures of Center

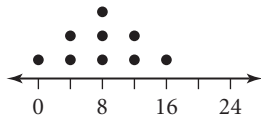
Name _____ Period _____ Date _____

1. Find the mean, median, mode, and range of each data set.

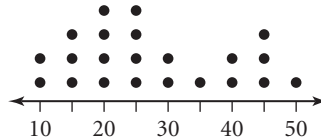
- a. {10, 54, 72, 43, 25, 29, 36, 10, 68}
- b. {16, 11, 31, 19, 12, 17, 13, 14}
- c. {12, 26, 21, 36, 25, 20, 21}
- d. {25, 25, 30, 30, 35, 35}

2. Find the mean, median, and mode of each dot plot.

a.



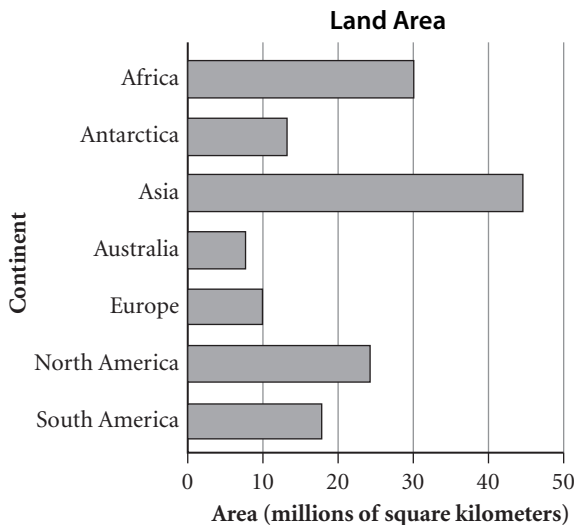
b.



3. Create a data set that fits each description.

- a. The median age of Shauna and her six siblings is 14. The range of their ages is 12 years and the mode is 10.
- b. Jorge took six math tests during the current marking period. His mean mark is 83 and his median mark is 85.
- c. Laurel took a survey of the number of coins eight students had in their pockets. The minimum was 7, the mode was 11, the median was 10, and the range was 9.

4. This bar graph shows the approximate land area of the seven continents.



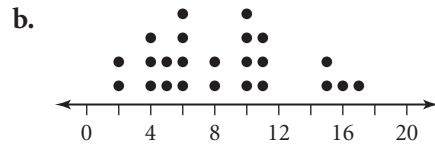
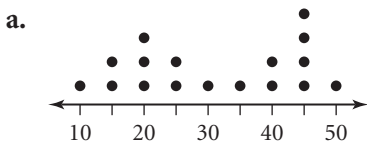
- a. Find the approximate mean and median of this data set.
- b. What is the approximate range of this data set?

Lesson 1.3 • Five-Number Summaries and Box Plots

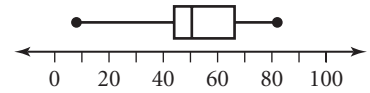
Name _____ Period _____ Date _____

- Find the five-number summary for each data set.
 - {37, 44, 5, 8, 20, 11, 14}
 - {10, 1, 3, 4, 30, 4, 20, 22, 10, 25, 30}
 - {25, 27, 33, 14, 31, 16, 22, 24, 43, 25, 37, 39, 42}
 - {35, 17, 2, 32, 47, 13, 22, 7, 21, 55, 5, 52, 34, 41, 25, 8}

- Circle the points that represent the five-number summary values in the dot plots below. If two data points are needed to calculate the median, first quartile, or third quartile, draw a circle around both points. List the five-number summary values for each plot.



- Which data set matches this box plot? (More than one answer may be correct.)



- {70.2, 52, 24.5, 61, 77, 26, 9, 51, 64, 28, 54, 28}
- {59, 47, 79, 8, 65, 42, 23, 70, 82, 62, 48, 42, 52, 67.5, 49, 46}
- {82, 36, 42, 8, 61, 50}

- Create a data set with the five-number summary 6, 10, 12, 15, 20 that contains each number of values.

- 11
- 12

- This table shows the number of bachelor's degrees earned in various fields at a private university for 1994 and 2004.

Bachelor's Degrees Awarded

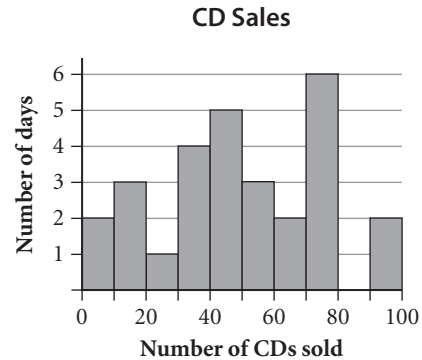
Degree field	1994	2004	Degree field	1994	2004
Architecture	76	78	English literature	129	143
Biological sciences	158	172	Law	18	29
Business and management	410	422	Mathematics	62	65
Computer science	132	205	Philosophy	43	52
Cultural studies	25	46	Physical sciences	107	110
Education	247	261	Visual and performing arts	154	141
Engineering	351	370			

- Give the five-number summaries and the mean for each data set.
- Create a box plot for each data set on the same number line.

Lesson 1.4 • Histograms and Stem-and-Leaf Plots

Name _____ Period _____ Date _____

- The owner of an independent record shop monitored CD sales over a period of days. This histogram shows the results.
 - Find the total number of days included in this data set.
 - For how many days were fewer than 20 CDs sold?
 - For how many days were at least 50 but fewer than 80 CDs sold?
 - Explain the empty 80–90 interval.
 - Construct another histogram for this data set using intervals of 20 rather than 10.



- The table shows the results of a study that found the distance each of 191 buses traveled before its first major engine failure.
 - Construct a histogram for this data.
 - How many buses traveled at least 100,000 mi before major engine failure?
 - If an engine warranty covered the cost of repair only for less than 80,000 mi, how many of the buses would have been repaired under the warranty?
 - What is a reasonable median value of the data?
- Add a reasonable box plot to your histogram for Exercise 2.
- Dori did a survey of how many states the members of her class had visited. The results were

Distance before Major Engine Failure

Distance traveled (thousands of miles)	Number of buses
0–19	6
20–39	11
40–59	16
60–79	25
80–99	34
100–119	46
120–139	33
140–159	16
160–179	2
180–199	2

(*Technometrics*, Nov. 1980, p. 588)

10 15 23 2 20 31 14 10 8 19 8 42 15 22 6 34 19 3 24 17 11

- Find the minimum, maximum, and range of this data.
- Create a stem plot of the data set.

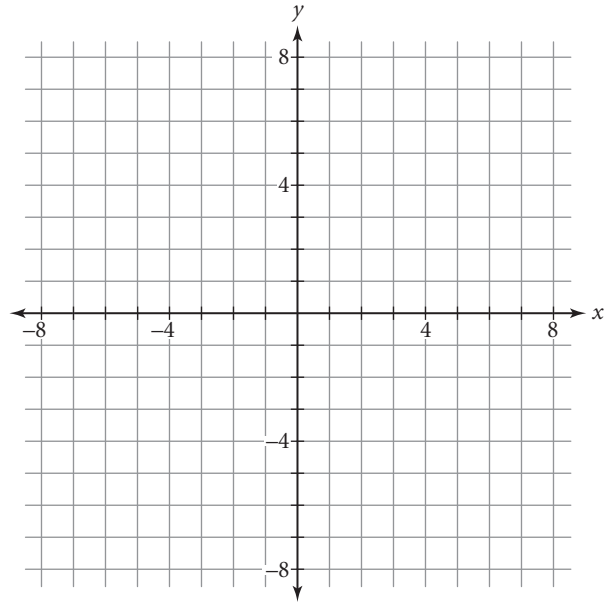
Lesson 1.6 • Two-Variable Data

Name _____ Period _____ Date _____

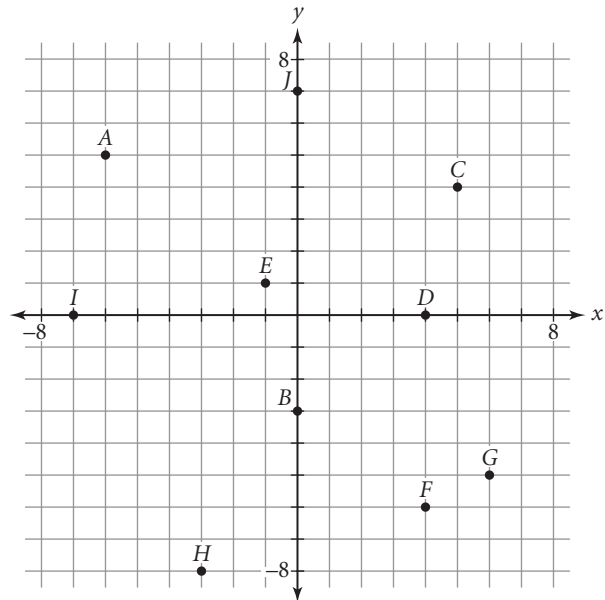
1. Identify the location (axis or quadrant) of each point listed.
 Example: $(2, -2)$ is in Quadrant IV; $(2, 0)$ is on the x -axis.

$A(4, -3)$ $B(2.5, 4)$ $C(-3, 0)$ $D(-6.5, -5)$ $E(-2, -3)$
 $F(-4, 6)$ $G(5, 4)$ $H(0, -7)$ $I(1, -4)$

2. Plot each point in Exercise 1 on this coordinate plane. Label each point with its corresponding letter name.



3. Use this scatter plot to answer the questions.
- Give the coordinates of each point on the scatter plot.
 - How many points are in Quadrant IV?
 - Name the points in Quadrant II.



Lesson 1.7 • Estimating

Name _____ Period _____ Date _____

1. The table below shows the cost of various phone calls. Graph the scatter plot (*length of call, cost of call*) of this data set.

Phone Call Costs

Length of call (min)	3	5	12	19	23	30
Cost of call (\$)	1.50	2.40	5.55	8.70	10.50	15.00

2. The table below shows partial results of a chemical reaction.

Chemical Reaction

Elapsed time (h)	0	1	2	3	4	5	6	7	8
Amount of new substance formed (mL)	0	1.0	2.0	3.0	4.5	6.8	9.0	10.0	11.0

- a. Graph the scatter plot (*elapsed time, amount of new substance formed*) of this data set.
- b. Graph the line $y = x$.
- c. Describe any pattern you see in the data.
3. This table shows the *Forbes* ranking of the top ten places in the United States for business in 2004 compared with their ranking in 2003.

Ten Best Places for Business in the United States

Place	Rank in 2004	Rank in 2003
Madison, WI	1	5
Raleigh-Durham, NC	2	3
Austin, TX	3	1
Washington, D.C.-Northern VA	4	10
Atlanta, GA	5	4
Provo, UT	6	6
Boise, ID	7	2
Huntsville, AL	8	11
Lexington, KY	9	14
Richmond, VA	10	12

(www.forbes.com/lists)

- a. Graph the scatter plot (*rank in 2004, rank in 2003*) of this data set. Label each point with an appropriate abbreviation.
- b. Graph the line $y = x$. Which places are on the line? What does this mean?
- c. Which places are below the $y = x$ line? What does this mean?
- d. Which places are above the $y = x$ line? What does this mean?
- e. According to *Forbes*, which place showed the greatest improvement in its business climate between 2003 and 2004? How can you tell?

Lesson 1.8 • Using Matrices to Organize and Combine Data

Name _____ Period _____ Date _____

Use these matrices to answer each part of Exercises 1–3.

$$[A] = \begin{bmatrix} 2 & 5 \\ 6 & 3 \end{bmatrix} \quad [B] = \begin{bmatrix} -2 & 4 & 3 \\ 8 & -1 & 5 \end{bmatrix}$$

$$[C] = \begin{bmatrix} -2 & 4 \\ 7 & -5 \end{bmatrix} \quad [D] = \begin{bmatrix} -1 & -5 \\ 3 & -5 \\ -2 & 6 \end{bmatrix}$$

$$[L] = \begin{bmatrix} 3 & -5 \\ 4 & 2 \\ 6 & -3 \end{bmatrix} \quad [M] = \begin{bmatrix} 4 & 3 \\ 1 & 2 \end{bmatrix}$$

$$[N] = \begin{bmatrix} 4 & 2 \\ 5 & 3 \\ 2 & 7 \end{bmatrix} \quad [P] = \begin{bmatrix} 3 & -2 & 4 \\ -1 & 5 & -3 \end{bmatrix}$$

- What are the dimensions of each matrix?
 - $[A]$
 - $[B]$
 - $[C]$
 - $[D]$
 - $[L]$
 - $[M]$
 - $[N]$
 - $[P]$
- Which matrices can you add together?
- Do each calculation or explain why it is not possible.
 - $[A] + [C]$
 - $[D] + [P]$
 - $-3 \cdot [N]$
 - $[L] - [N]$
 - $4 \cdot [C] - [M]$
 - $[B] + [P]$
- Matrix $[A]$ represents the price of 5 lb bags of three types of apples from two wholesalers. The rows show the types of apples: Macintosh, Red Delicious, and Granny Smith. The columns show the wholesalers: Pete's Fruits and Sal's Produce. Matrix $[B]$ represents the number of 5 lb bags of each type of apple that Juanita needs today for her corner fruit boutique. She can place an order with only one wholesaler.

$$[A] = \begin{bmatrix} 3.79 & 4.49 \\ 3.19 & 2.99 \\ 5.59 & 5.29 \end{bmatrix} \quad [B] = [8 \quad 10 \quad 5]$$

Perform a matrix operation to help Juanita make the better choice. Explain the meaning of your answer and how it will help Juanita.