1 Practice • Organizing Data

Directions: Use the information on page 5 to help you do this page.

This is a tally sheet indicating the number of absences during one week for 7th grade students in each homeroom.

7th Grade Arrow Valley Middle School Weekly Absence Report

	Monday	Tuesday	Wednesday	Thursday	Friday
Room 12	|||	||	|	||	||||
Room 13	𝍸	|||	||	|||	𝍸 |
Room 14	||	|			||
Room 15	|||	|||	|		|
Room 16	|	|	|	|	|||
Room 17	||			|||	||
Room 18	||||	|		|	||||

1. Create a table to organize this data both by day and by weekly totals.
2. What were the total absences for the week in the 7th grade? _____
3. Which homeroom had the fewest absences? _____
4. Which day of the week had the best attendance? _____
5. Which two days had the worst attendance? _____
6. Give a possible reason for the poor attendance on these days. _____

   _____
7. How many students were absent on Tuesday? _____
8. Which room had the worst attendance? _____
9. Two students were absent the entire week in room 13. How many other absences did room 13 have? _____
10. Could any one else have been absent the entire week in any room? Explain._____

    _____

Apple Valley Middle School has a snack table after school, which helps raise money for school projects. This tally sheet illustrates their sales for one afternoon.

Snack Table Sales for Thursday

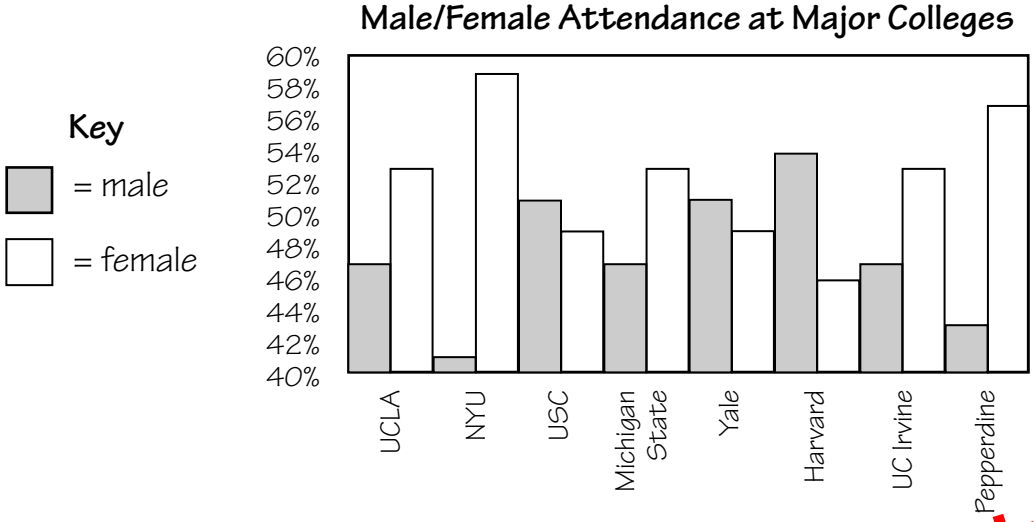
apples	||
juice	𝍸 |
colas	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |
candy bars	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |||
chips	𝍸 𝍸 𝍸 𝍸 ||||
peanuts	𝍸 ||
raisins	|||
candy jellies	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸

11. Create a table to organize this data.
12. Which product was the best seller?

    _____
13. Which two products were the least popular? _____
14. Did the students mainly buy healthy snacks or sweets? _____
15. How many snacks were sold altogether? _____
16. If every snack sold for $0.50, how much money was collected?_____

3 Practice • • • • • • Working with Double Bar Graphs

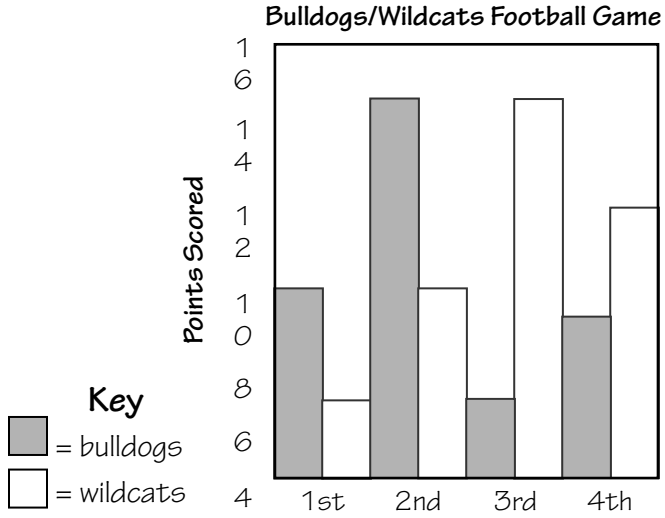
A **double-bar graph** is used to compare two sets of data. The double bar graph shown here illustrates the percentage of male/female attendance at several major colleges in the United States.



Directions: Use the information on page 13 and this graph to answer these questions.

1. What percentage of students at UCLA is male? _____ What percentage is female? _____
2. What percentage of students at Yale is male? _____ What percentage of students is female? _____
3. What percentage of students at NYU (New York University) is male? _____
   What percentage is female? _____
4. In which two colleges is the percentage of male and female students almost the same? _____
5. Which college has the greatest disparity between the percentage of male and female students?
   _____
6. What is the total percentage of male and female attendance at each college? _____
   Why? _____
7. Using the graph as a representative of college attendance, are more males or more females attending these colleges? _____

Directions: Study this double bar graph illustrating the points scored by two teams, the Bulldogs and the Wildcats, in the four quarters of a football game.



8. What was the Bulldogs' best quarter? _____
9. What was the Wildcats' best quarter? _____
10. How many total points did each team score in the game? _____
11. Which team got better in the first three quarters?
    _____
12. How might a coach use this graph?
    _____
    _____

2 How to ..... How to Use and Interpret Bar, Circle, and Line Graphs

Facts to Know

Graphs are effective tools used to compare data in clear, concise, visual terms.

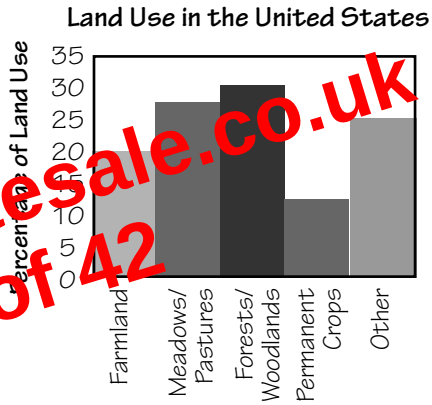
Three of the most common graphs are bar graphs, circle graphs (pie charts), and line graphs.

Graphing Terms

- The **range** is the difference between the least and the greatest values in a set of data.
  (2, 4, 7, 8, 10, 12)
  12 – 2 = 10
  The *range* is 10.
- The **scale** is the set of values or numbers along the side of a graph.
- The **interval** is the regular difference between each unit on the scale. The interval is always the same between each unit of the scale.
- The **axes** are the two labeled lines, one vertical and one horizontal, along the sides of a graph. The scale runs along one of the axes.

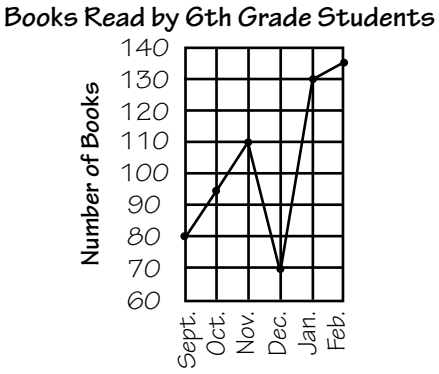
Single Bar Graphs

Single bar graphs offer a clear, visual presentation of facts. Bar graphs may be either vertical or horizontal. The names of the items being compared are listed, one in each block, along the bottom axis of the bar graph. The scale is marked in even intervals along the vertical axis.



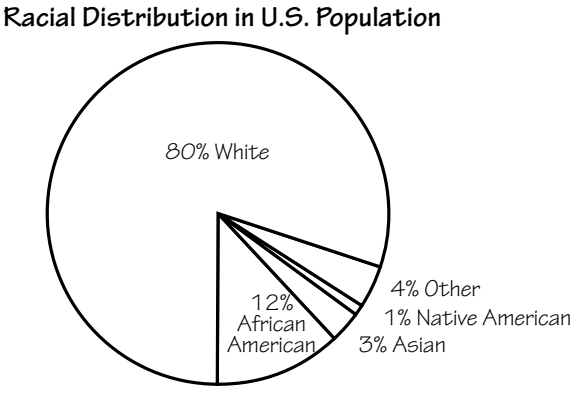
Single Line Graphs

Single line graphs are often used to compare change over time or the frequency of an event. The time intervals or items being compared are marked along the horizontal axis of the line graph. The scale is marked in even intervals along the vertical axis.



Circle Graphs (Pie Charts)

Circle graphs, or *pie charts*, demonstrate how a whole is split into individual parts.
The parts are rarely equal. The size of the angle shows how one part compares to another. They are usually expressed in percentages of the whole, based on 100%. Labels, listing names and amounts, are written on the slices of the graph.



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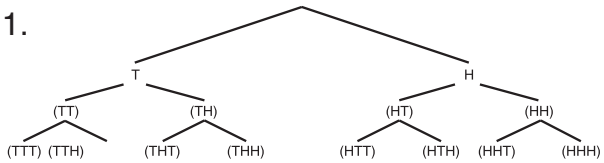
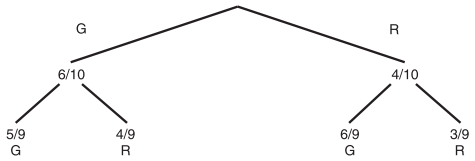
1. 

2. Answers will vary.
3. 

If Arthur takes a green marble, there will be only 5 green left, along with the 4 red. If he takes a red marble, there will be only 3 red ones left, along with the 6 green.

Page 103

1. Anchorage
2. Houston gets twice as much rain as Denver in the same amount of time.
3. Anchorage—clothes for cooler climate; Washington—clothes for warmer climate.
4. Answers will vary.
5. Denver
6. Houston
7. They have similar amounts of snow or rain in a similar amount of time.
8. Answers will vary.

6 How to . . . . . Collect, Organize, Represent, and Interpret Your Data

Facts to Know

Data is all around you—in the classroom, on the playing field, at home, in every store, and many other places as well.

Collecting Data

- Use tally sheets, record sheets, or lists of data to record your information.
- Use almanacs, field guides, encyclopedias, or textbooks to find data on history or science.
- Use magazines, newspapers, or television news programs to find up-to-the-minute data about daily life.

Data Ideas

- passing percentages
- hitting/baseball
- grades/scores
- store sales
- calories taken in/expended
- basketball shooting scored
- heights or weights
- student food preferences
- time expended on . . .
- comparative prices

Organizing Data

- Use tables and charts to group your data according to size, time periods, amounts, or some other numerical pattern.

Representing Data

- Choose the best type of graph to represent your data in a clear, visual, and effective way.

Bar Graph	compares data in numerical change
Circle Graph	shows percentages of 100, parts of a whole
Line Graph	compares change over a period of time
Pictograph	symbols used to compare data
Histogram	compares data in varying intervals
Double Bar Graph	compares sets of related data
Multiple-line Graph	compares how two or more related sets of data change over a period of time
Scattergram	shows how pieces of data are related

Interpreting Data

- Use the measures of central tendency to determine various averages for sets of data.

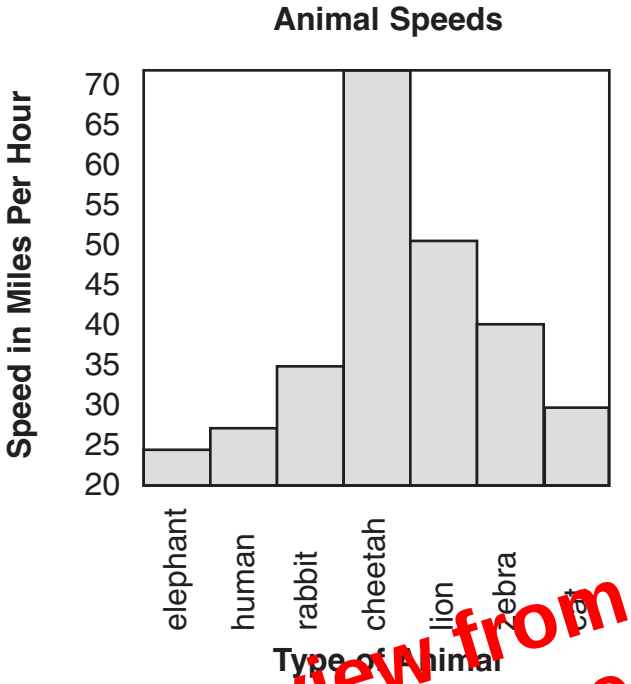
  Mode—most frequently occurring number
  Median—the middle number in a set of data arranged from least to greatest
  Mean—the sum of the values divided by the number of values
- Look for the *trend line* or *line of best fit*.
- Use *interpolation* to find an unknown value within or between known pieces of data.
- Use *extrapolation* to find data beyond the values listed in a set of data.
- Look for *positive or negative correlation* to determine if two sets of data are actually related to each other.

Recognizing Misleading Statistics

- Study graphs to determine if they are truncated or designed to distort data.
- Use common sense to determine if sets of data are related or accidentally have the same pattern.

Practice 23

This bar graph illustrates the speeds of several animals in miles per hour. Study the graph and answer the questions below.



1. How much faster is a lion than a cat? _____

2. The bar graph makes it look as if the lion is 3 times faster than the cat. Why does it look like that? _____

3. Is a cat 2 times as fast as an elephant? _____

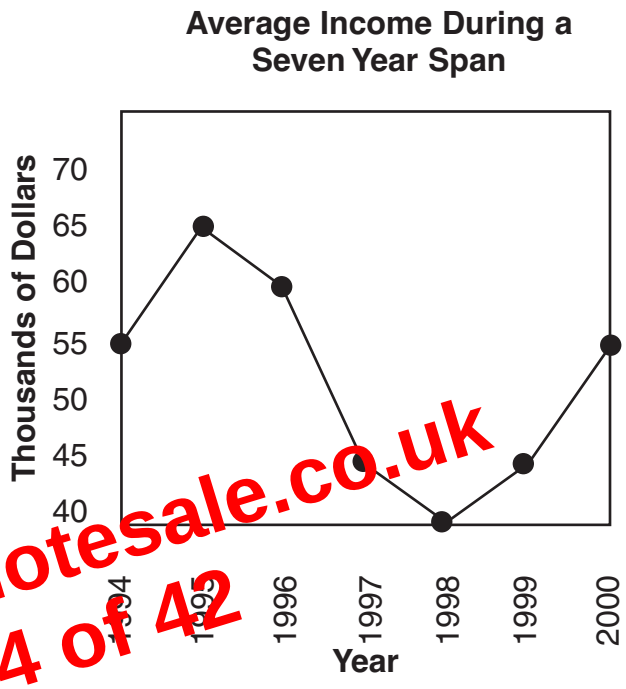
4. How much faster is a cat than an elephant? _____

5. How much faster than a rabbit is a cheetah? _____

6. How does the graph distort the data and make it look as if the cheetah was 2 times as fast as a rabbit? _____

7. How could the scale of the graph be changed to make it less distorted? _____

This line graph illustrates average income for a group of people over 7 years. Study the graph. Decide how the graph could be misinterpreted. Answers the questions below.



8. In which year did the average reach its highest point? _____

9. In which year did the average reach its lowest point? _____

10. How much more did the average person earn in 2000 than in 1999? _____

11. Why does the graph make it appear that income tripled from 1999 to 2000? _____

12. What is the difference between the highest yearly income and the lowest yearly income? _____

13. How is the graph distorted or misleading? _____

14. How could the distortion be corrected? _____

Answer Key

Page 4

1. 279 marbles
2. 146 marbles
3. 188 marbles
4. 55 marbles
5. 1,316 marbles
6. 37 marbles
7. 96 marbles
8. 222 marbles
9. 245 marbles
10. 468 marbles
11. 71 marbles
    12 marbles
12. 444 marbles

Page 5

1. addition
   19,056 bases
2. subtraction
   1,689 at bats
3. addition
   2,129 home runs
4. division
   177 hits
5. multiplication
   3,928,500 tickets
6. subtraction
   1,578 strike outs
7. division
   2,800 groups
8. subtraction
   329 walks
9. division
   175 hits (174 R13)
10. division
    .600 or 60%

Page 6

1. subtraction
   37,036 people
2. subtraction
   14,443 people
3. addition
   132,118 fans
4. addition
   35,292 fans
5. division
   860 packages
6. division
   2,000 packages
7. subtraction
   28,538 fans
8. division
   8,250 packages
9. multiplication
   601,536 fans
10. multiplication
    3,649,050 tickets

Page 7

1. 7/12 lb.
2. 1 5/12 lb.
3. 1/8 lb.
4. 1/12 lb.
5. 5 lb.
6. 1/4 feet
7. 1 7/10 lb.
8. 11/24 feet
9. 6 cups
10. 1 19/30 lb.

Page 8

1. 15 ounces
2. 24 3/4 ounces
3. 21/40 ounces
4. 25 students
5. 14 students
6. 1/12 ounces
7. 1 7/10 ounces
8. 27 1/5 ounces
9. 9 3/8 ounces
10. 8 3/4 lb.
11. 1 1/2 ounces
12. 28 cups

Page 9

1. 10 3/8 inches
2. 32 3/4 inches
3. [illegible] inches
4. 51 5/8 inches
5. 83 7/8 inches
6. 3 1/4 lb.
7. 20 1/4 lb.
8. 24 1/6 inches
9. 14 1/8 ounces
10. 20 3/8 inches

Page 10

1. 76 inches
2. 52 1/5 inches
3. 10 prints
4. 8 prints
5. 150 inches
6. 355 inches
7. 23 1/3 inches
8. 7 prints
9. 451 inches
10. 8 prints

Page 11

1. 2 1/4 feet
2. 9 5/6 feet
3. 17 3/4 feet
4. 3 1/8 feet
5. 2 1/3 feet
6. 6 2/5 times
7. 12 lengths
8. 6 1/12 feet
9. 5 1/2 feet
10. 14 7/12 feet

Page 12

1. $5.04
2. $0.56
3. $63.68
4. $43.45
5. $5.51
6. $5.04
7. $29.25
8. $0.96
9. $10.13
10. $20.15
11. $18.35
12. $17.10

Page 13

1. 7.9 centimeters
2. 87.6 centimeters
3. 30.25 centimeters
4. 220.89 centimeters
5. 204.26 centimeters
6. 347.863 centimeters
7. 24.99 centimeters
8. 1.201 centimeters
9. 56.899 centimeters
10. 59.663 centimeters
11. 2[illegible] centimeters
12. 18[illegible] centimeters

Page 14

1. 0.21 lb.
2. 100.2 ounces
3. 1.09 ounces
4. 10.2 candies
5. 45.1 lb.
6. 80.5 ants
7. 969.624 ounces
8. $0.23
9. $0.38
10. 157.68 lb.

Page 15

1. 75%
2. 72%
3. 75%
4. 60%
5. 75%
6. 80%
7. 64%
8. 67%
9. 70%
10. 82%

Page 16

1. $34.00
2. $4.00
3. $1.32
4. $9.52
5. $7.00
6. $2.48
7. $22.80
8. $4.00
9. $18.00
   $42.00
10. $5.24
    $29.71

Page 17

1. 467.476 mi.
2. 2,246.8 mi.
3. 32.422 feet
4. 94.14 mi.
5. 15.23 mi.
6. 44.636 mi.
7. 177.813 m.p.h.
8. 3,030.957 lb.
9. 91.05 mi.
10. 880.431 mi.

Page 18

1. 60 m.p.h.
2. 50 m.p.h.
3. 30 m.p.h.
4. 60 m.p.h.
5. 50 m.p.h.
6. 55 m.p.h.
7. 52 m.p.h.
8. 40 m.p.h.
9. 40 m.p.h.
10. [illegible] m.p.h.

Page 19

1. 3,200 feet
2. 40 min.
3. 10,000 feet
4. 7,128 feet
5. 396 min.
6. 7,740 feet
7. 24,000 feet
8. 503 min.
9. 410 min.
10. 30,400 feet

Page 20

1. $1
2. $1
3. $11
4. 7
5. $21
6. 2
7. -$6
8. -24
9. 17
10. -72
11. -32
12. $226

Page 21

1. -$12
2. -$20
3. +42
4. -$7
5. -9
6. +10
7. $270
8. +156
9. 64
10. +5
11. -$5
12. +20

Page 22

1. polar bear
2. leopard/camel
   dog/cat
3. 2 yr.
4. pig
5. 9 yr.
6. 15 yr..
7. 1 yr.
8. 9 yr.
9. 55 yr.
10. 70 yr.

Page 23

1. 30%
2. 5th/8th
3. 60%
4. no
5. 45%
6. 40%

Page 24

1. 1960
2. 1990–2000
3. 1960
4. 1950–1960
5. 1990–2000
6. 1970–1980
7. 1960–1970
8. the same
9. 10/11
10. 12/13
11. 16
12. 7/8/9
13. taller
14. 14

Page 25

	Frequency
1. 12	
2. 1	Cat 8
3. 4	Dog 12
4. 2	Snake 2
5. 2	Bird 3
6. 12	Mouse 3
7. 18	Hamster 4
8. 1	Fish 6
9. 4	Other 3

10. dog
11. snake
12. 5
13. 41
14. 27

Page 26

1. 10 m.p.h.
2. the scale starts at 20
   rather than 0