Grade 4 Chapter 4
Table of Contents

Teacher's Guide to Using
   Chapter 4 Resources ............................................ iv

Chapter 4 Graphic Organizer ................................. 1
Student Glossary .................................................. 2
Family Letter ........................................................ 4
Family Letter Spanish ............................................. 5
Chapter 4 Anticipation Guide .............................. 6
Chapter 4 Game ................................................... 7

Lesson 4-1 Collect and Organize Data
   Reteach ......................................................... 8
   Skills Practice ................................................. 9
   Homework Practice ........................................ 10
   Problem-Solving Practice ................................. 11
   Enrich .......................................................... 12

Lesson 4-2 Find Median, Mode, and Outliers
   Reteach ......................................................... 13
   Skills Practice ................................................. 14
   Homework Practice ........................................ 15
   Problem-Solving Practice ................................. 16
   Enrich .......................................................... 17

Lesson 4-3 Problem-Solving Strategy:
   Make a Table
   Reteach ......................................................... 18
   Skills Practice ................................................. 20
   Homework Practice ........................................ 21
   Enrich .......................................................... 22

Lesson 4-4 Line Plots
   Reteach ......................................................... 23
   Skills Practice ................................................. 24
   Homework Practice ........................................ 25
   Problem-Solving Practice ................................. 26
   Enrich .......................................................... 27

Lesson 4-5 Bar and Double Bar Graphs
   Reteach ......................................................... 28
   Skills Practice ................................................. 29
   Homework Practice ........................................ 30
   Problem-Solving Practice ................................. 31
   Enrich .......................................................... 32

Lesson 4-6 Problem-Solving Investigation:
   Choose a Strategy
   Reteach ......................................................... 33
   Skills Practice ................................................. 35
   Homework Practice ........................................ 36
   Enrich .......................................................... 37

Lesson 4-7 Interpret Line Graphs
   Reteach ......................................................... 38
   Skills Practice ................................................. 39
   Homework Practice ........................................ 40
   Problem-Solving Practice ................................. 41
   Enrich .......................................................... 42

Lesson 4-8 Analyze Graphs
   Reteach ......................................................... 43
   Skills Practice ................................................. 44
   Homework Practice ........................................ 45
   Problem-Solving Practice ................................. 46
   Enrich .......................................................... 47

   Individual Progress Checklist ........................... 48

Chapter Tests:
   Chapter Diagnostic Assessment ........................... 49
   Chapter Pretest ................................................. 50
   Quiz 1 ........................................................... 51
   Quiz 2 ........................................................... 52
   Quiz 3 ........................................................... 53
   Mid-Chapter Review .......................................... 54
   Vocabulary Test ............................................... 55
   Oral Assessment ............................................... 56
   Chapter Project Rubric ....................................... 58
   Foldables Rubric .............................................. 59
   Test Form 1 .................................................. 60
   Test Form 2A ................................................ 62
   Test Form 2B ................................................ 64
   Test Form 2C ................................................ 66
   Test Form 2D ................................................ 68
   Test Form 3 .................................................. 70
   Extended-Response Test .................................. 72

Recording Sheet .............................................. 73

Cumulative Standardized Test Practice .......... 74
Answer Pages ................................................. A1
Teacher’s Guide to Using the
Chapter 4 Resource Masters

The Chapter 4 Resource Masters includes the core materials needed for Chapter 4. These materials include worksheets, extensions, and assessment options. The answers for these pages appear at the back of this booklet.

All of the materials found in this booklet are included for viewing and printing on the TeacherWorks Plus™ CD-ROM.

Chapter Resources

Graphic Organizer (page 1) This master is a tool designed to assist students with comprehension of grade-level concepts. You can use this graphic organizer in coordination with the appropriate lesson. While the content and layout of these tools vary, their goal is to assist students by providing a visual representation from which they can learn new concepts.

Student Glossary (page 2) This master is a study tool that presents the key vocabulary terms from the chapter. You may suggest that students highlight or star the terms they do not understand. Give this list to students before beginning Lesson 4-1. Remind them to add these pages to their mathematics study notebooks.

Anticipation Guide (page 6) This master is a survey designed for use before beginning the chapter. You can use this survey to highlight what students may or may not know about the concepts in the chapter. If feasible, interview students in small groups, asking them the interview questions in the guide. There is space for recording how well students answer the questions before they complete the chapter, to determine their progress.

Game (page 7) A game is provided to reinforce chapter concepts and may be used at appropriate times throughout the chapter.

Resources for Lessons

Reteach Each lesson has an associated Reteach worksheet. In general, the Reteach worksheet focuses on the same lesson content but uses a different approach, learning style, or modality than that used in the Student Edition. The Reteach worksheet closes with computational practice of the concept.

Skills Practice The Skills Practice worksheet for each lesson focuses on the computational aspect of the lesson. The Skills Practice worksheet may be helpful in providing additional practice of the skill taught in the lesson. It also contains word problems that cover the skill. Spaces for students’ answers are provided on the worksheet.

Homework Practice The Homework Practice worksheet provides an opportunity for additional computational practice. The Homework Practice worksheet includes word problems that address the skill taught in the lesson. Spaces for students’ answers are provided on the worksheet.

Problem-Solving Practice The Problem-Solving Practice worksheet presents additional reinforcement in solving word problems that apply both the concepts of the lesson and some review concepts.

Enrich The Enrich worksheet presents activities that extend the concepts of the lesson or offer a historical or multicultural look at the lesson’s concepts. Some Enrich materials are designed to widen students’ perspectives on the mathematics they are learning.

Resources for Problem-Solving Lessons

In recognition of the importance of problem-solving strategies, worksheets for problem-solving lessons follow a slightly different format. For problem-solving lessons, a two-page Reteach worksheet offers a complete model for choosing a problem-solving strategy. For each Problem-Solving Strategy lesson, Reteach and Homework
Practice worksheets offer reinforcement of the strategy taught in the Student Edition lesson. In contrast, the Problem-Solving Investigation worksheets include a model strategy on the Reteach worksheets and provide problems requiring several alternate strategies on the Homework Practice and Skills Practice worksheets.

**Assessment Options**

The assessment masters in the *Chapter 4 Resource Masters* offer a wide variety of assessment tools for monitoring progress as well as final assessment.

**Individual Progress Checklist** This checklist explains the chapter’s goals or objectives. Teachers can record whether a student’s mastery of each objective is beginning (B), developing (D), or mastered (M). The checklist includes space to record notes to parents as well as other pertinent observations.

**Chapter Diagnostic Assessment** This one-page test assesses students’ grasp of skills that are needed for success in the chapter.

**Chapter Pretest** This one-page quick check of the chapter’s concepts is useful for determining pacing. Performance on the pretest can help you determine which concepts can be covered quickly and which specific concepts may need additional time.

**Quizzes** Three free-response quizzes offer quick assessment opportunities at appropriate intervals in the chapter.

**Mid-Chapter Review** This one-page chapter test provides an option to assess the first half of the chapter. It includes both multiple-choice and free-response questions.

**Vocabulary Test** This one-page test focuses on chapter vocabulary. It is suitable for all students. It includes a list of vocabulary words and questions to assess students’ knowledge of the words.

**Oral Assessment** This two-page test consists of one page for teacher directions and questions and a second page for recording responses. Although this assessment is designed to be used with all students, the interview format focuses on assessing chapter content assimilated by ELL students. The variety of approaches includes solving problems using manipulatives as well as pencil and paper.

**Chapter Project Rubric** This one-page rubric is designed for use in assessing the chapter project. You may want to distribute copies of the rubric when you assign the project and use the rubric to record each student’s chapter project score.

**Foldables Rubric** This one-page rubric is designed to assess the Foldables graphic organizer. The rubric is written to the students, telling them what you will be looking for as you evaluate their completed Foldables graphic organizer.

**Leveled Chapter Tests**

- **Form 1** assesses basic chapter concepts through multiple-choice questions and is designed for use with on-level students.
- **Form 2A** is designed for on-level students and is primarily for those who may have missed the Form 1 test. It may be used as a retest for students who received additional instruction following the Form 1 test.
- **Form 2B** is designed for students with a below-level command of the English language.
- **Form 2C** is a free-response test designed for on-level students.
- **Form 2D** is written for students with a below-level command of the English language.
- **Form 3** is a free-response test written for above-level students.
- **Extended-Response Test** is an extended response test for on-level students.

**Student Recording Sheet** This one-page recording sheet is for the standardized test in the Student Edition.

**Cumulative Standardized Test Practice**

This three-page test, aimed at on-level students, offers multiple-choice questions and free-response questions.

**Answers**

The answers for the Anticipation Guide and Lesson Resources are provided as reduced pages with answers appearing in black. Full size line-up answer keys are provided for the Assessment Masters.
## Graphic Organizer

Fill in the missing information.

<table>
<thead>
<tr>
<th></th>
<th>Mode</th>
<th>Median</th>
<th>Outliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 2, 5, 7, 9, 10, 85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15, 19, 19, 25, 28, 29, 78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1, 3, 4, 4, 6, 9, 35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3, 10, 10, 30, 40, 50, 60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8, 21, 12, 8, 92, 8, 21</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Student-Built Glossary

This is an alphabetical list of new vocabulary terms you will learn in Chapter 4. As you study the chapter, complete each term’s definition or description. Remember to add the page number where you found the term. Add this page to your math study notebook to review vocabulary at the end of the chapter.

<table>
<thead>
<tr>
<th>Vocabulary Term</th>
<th>Found on Page</th>
<th>Definition/Description/Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>double bar graph</td>
<td></td>
<td></td>
</tr>
<tr>
<td>frequency chart</td>
<td></td>
<td></td>
</tr>
<tr>
<td>line graph</td>
<td></td>
<td></td>
</tr>
<tr>
<td>line plot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Student-Built Glossary (continued)

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td></td>
</tr>
<tr>
<td>median</td>
<td></td>
</tr>
<tr>
<td>mode</td>
<td></td>
</tr>
<tr>
<td>outlier</td>
<td></td>
</tr>
<tr>
<td>survey</td>
<td></td>
</tr>
<tr>
<td>tally</td>
<td></td>
</tr>
</tbody>
</table>
Dear Family,

Today my class started Chapter 4, Statistics: Data and Graphs. I will be learning to read and interpret data. I will also be learning to display data on a number line, and in graphs, tables, and charts. Here are my vocabulary words and an activity that we can do together.

Love, ______________________

Key Vocabulary

data  Another word for information.

bar graph  A graph that compares data by using bars of different lengths and heights.

line graph  A graph that uses points connected by line segments to represent data.

median  The middle number (or item) when a set of numbers is arranged from least to greatest. Example: 34, 51, 62, 69, 81 (62 is the median)

mode  The number(s) (or item) that occurs most often in a set of numbers. A set can have more than one mode. Example: 29, 21, 29, 30, 29 (29 is the mode)

Activity

Open the cupboards in your kitchen. Create a chart to tally the amount of each can, bottle, or box and brand present. What do you have the most of? What do you have the least of?

Books to Read

X Marks the Spot
by Lucille Recht Penner

The Water Hole
by Graeme Base

How Many Snails?
by Paul Giganti, Jr.
Estimada familia:

Hoy mi clase comenzó el Capítulo 4, Estadística: Los datos y las gráficas. Aprenderé a leer e interpretar gráficas y también a representar los datos en una recta numérica y en gráficas, tablas y diagramas. A continuación, están mis palabras de vocabulario y una actividad que podemos hacer juntos.

Cariños, ______________

Vocabulario clave

datos Otra palabra para decir información

gráfica de barras dobles Gráfica de barras que compara dos grupos de datos relacionados

gráfica lineal Gráfica que usa puntos unidos por segmentos de recta para representar datos

mediana El número central cuando un conjunto de datos se ordena de menor a mayor. Ejemplo: 34, 51, 62, 69, 81 (62 es la mediana)

moda Número o números que ocurre(n) con mayor frecuencia en un conjunto de números. Un conjunto puede tener más de una moda. Ejemplo: 29, 21, 29, 30, 29 (29 es la moda)

Actividad

Abran las alacenas de la cocina. Diseñen un diagrama para contar la cantidad de cada objeto y su marca. ¿De qué tienen la mayor cantidad? ¿La menor cantidad?

Libros recomendados

X Marks the Spot
de Lucille Recht Penner

The Water Hole
de Graeme Base

How Many Snails?
de Paul Giganti, Jr.
### Anticipation Guide

**Statistics: Data and Graphs**

#### Before you begin Chapter 4

- Read each statement.
- Decide whether you agree (A) or disagree (D) with the statement.
- Write A or D in the first column OR if you are not sure whether you agree or disagree, write NS (not sure).

<table>
<thead>
<tr>
<th>STEP 1 A, D, or NS</th>
<th>Statement</th>
<th>STEP 2 A or D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>In a set of data, the median is the number that occurs most often.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>In a set of data, the mode is the number in the middle when the numbers have been arranged from least to greatest.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>A table can often help you to calculate an answer.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>A line plot is a method to represent data using Xs above a number line.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>A bar graph is helpful because it allows you to compare data.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>A double bar graph displays three sets of related data.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>You should never estimate when reading a bar graph.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>A line graph can help you to make predictions about what will happen in the future.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>You could use a line graph to plot the change in temperature during the year in your town.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Survey results can be represented on a number line.</td>
<td></td>
</tr>
</tbody>
</table>

#### After you complete Chapter 4

- Reread each statement and complete the last column by entering an A (agree) or a D (disagree).
- Did any of your opinions about the statements change from the first column?
- For those statements that you mark with a D, use a separate sheet of paper to explain why you disagree. Use examples, if possible.
Chapter 4 Game

Hit the Grid!

You will need:
Graph paper (1 sheet per player), pencils

This can be played with just two people, or with two teams.

1. Outline a $10 \times 10$ grid on your graph paper.
2. Label the left side and bottom of the grid from 1–10.
3. Choose 1 point on your grid and place an X on it.
4. Place Xs on the 8 points that surround your first X.
   (Do not share your grids!)
5. Choose which player or team will go first. The first player guesses
   a point on her or his opponent’s grid by naming the coordinates. If
   that point has an X on it, your opponent must circle it and tell you
   that you got a hit. If the point does not have an X, it is a miss.
6. Have the second player guess coordinates. Mark it as a hit or tell
   that it is a miss.
7. Continue until one player has “hit” all of his or her opponent’s Xs.
   This player is the winner.

Example:

Step 3

Step 4

Step 5:
The first player guesses point (2, 6). The second player circles it, and
says “Hit.” The second player then tries to guess a point on the
first player’s grid.
Marcia counted the number of letters in each word in a story. The data is shown below.

**Number of Letters in Words in a Story**

<table>
<thead>
<tr>
<th>Number of Letters in Words</th>
<th>Tally</th>
<th>Total Number of Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You can organize the data in a tally chart.

Example: For the first number, 3, make a tally mark in the table. Cross out the 3 in the data above. Then record and cross out the remaining 3s.

**Complete the tally chart.**

Use the tally chart. How many words had:

1. 3 letters? ____  
2. 2 letters? ____  
3. 8 letters? ____  
4. more than 3 letters? ____  
5. less than 3 letters? ____
Skills Practice

Collect and Organize Data

Fernando took note of the types of pants worn by his classmates on a certain day. Below is his recording.

Type of pants: jeans, corduroys, khaki, jeans, athletic pants, jeans, jeans, khaki, corduroys, corduroys, slacks, corduroys, cargo pants, cargo pants, jeans, athletic pants

1. Make a tally chart and frequency table of Fernando’s data.

2. What is the most common type of pants worn in Fernando’s class? What is the least common?
   Most common: _____________________________
   Least common: _____________________________

3. Create a tally chart for the following:
   Types of pizza preferred by Coach Andretti’s soccer team:
   
<table>
<thead>
<tr>
<th>Types of Pizza</th>
<th>Tally</th>
<th>Total Number Preferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pepperoni</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sausage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra Cheese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ham &amp; Pineapple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pepperoni</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Types of Pizza Preferred by Coach Andretti’s Soccer Team

   Pepperoni
   Sausage
   Extra Cheese
   Ham & Pineapple
   Pepperoni
   Sausage
   Extra Cheese
   Ham & Pineapple
   Cheese
Organize the set of data in a tally chart.

1. While Ryan waited for his bus, he watched cars go by and recorded the color of the cars. Here is what he saw.

   **Color of cars:** red, white, blue, white, tan, red, tan, blue, red, tan, blue, white, tan, red, tan, white, tan, white, tan, blue, tan, blue, white, blue, tan

<table>
<thead>
<tr>
<th>Color of Cars</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td></td>
</tr>
<tr>
<td>Tan</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td></td>
</tr>
</tbody>
</table>

Organize the set of data in a frequency table.

2. Alyssa records what her friends say is their favorite day of the school week. Place this information in a frequency table.

<table>
<thead>
<tr>
<th>Day</th>
<th>Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
</tr>
</tbody>
</table>

Spiral Review

Find the missing number in each equation. (Lesson 3–6)

3. $8 + 3 + 9 = 8 + ____$
4. $4 + 16 = 8 + 8 + ____$
5. $9 + 10 = 9 + 6 + ____$
6. $16 + 8 = 7 + 9 + ____$
7. $18 + 6 = 5 + 13 + ____$
8. $19 + 5 = 11 + 8 + ____$
Problem-Solving Practice

Collect and Organize Data

Solve. Use a separate sheet of paper if necessary.

1. Make a tally chart for the number of students in the third-, fourth-, and fifth-grade classes: 26, 25, 27, 27, 26, 28, 27.

2. Use the data in your tally chart from Exercise 1. Which class size is most common?

3. Make a tally chart and a frequency table for the number of books read by students during the summer: 4, 5, 7, 2, 4, 5, 6, 7, 8, 4, 5, 3. How many students took part in this survey?

4. If another student is added to the survey and says she read 7 books, how would you change your tally chart and frequency table to show this?

5. Make a tally chart and a frequency table for the data showing amount of time it takes students to do their homework: 35 min., 1 hour, 1 1/2 hours, 45 min., 60 min., 30 min., 45 min., 90 min., 1 1/2 hour. According to your frequency table, what is the longest time it takes the students to do their homework?

6. What is the difference between the greatest amount of time and the least amount of time spent doing homework?
In order to find out about their favorite foods, Oscar asked 10 of his classmates the following question: “What are your top three favorite snacks?” Look at his notes. Use them to organize the information in the chart below.

1. Pedro — cheese pizza, apples, vegetables and dip
2. Sara — yogurt, ice cream, pepperoni pizza
3. Jon — ice cream, bananas, popcorn
4. Theresa — pizza, vegetables and dip, chips
5. Abi — apples, pears, yogurt
6. Trevor — corn chips, pizza, vegetables and dip
7. Jair — apples, ice cream, pizza
8. Alison — pepperoni pizza, popcorn, chips
9. Bonita — pizza, apples, vegetables and dip
10. Dean — grapes, apples, cheese pizza

<table>
<thead>
<tr>
<th>Favorite Foods and Snacks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food/Snack</strong></td>
</tr>
<tr>
<td>Fruit</td>
</tr>
<tr>
<td>Pizza</td>
</tr>
<tr>
<td>Vegetables and Dip</td>
</tr>
<tr>
<td>Popcorn, Chips, etc.</td>
</tr>
<tr>
<td>Ice Cream &amp; Yogurt</td>
</tr>
</tbody>
</table>
Median, Mode, and Outliers

You can analyze data using the median and mode. Use the table to help you find the outlier, median, and mode.

**Outlier:** an item of data that lies outside of the data.

The outlier is 12

**Median:** the middle number when the data is arranged in order from least to greatest

1, 3, 5, 5, 12

↑

The median is 5.

**Mode:** the number that occurs most often

There are two 5s, so 5 is the mode.

Order the data from least to greatest. Then find the median, mode, and outlier.

1. Data: 6, 4, 3, 3, 0, 5, 18
   - List in order from least to greatest: ___, ___, ___, ___, ___, ___, ___
   - Median: ___  Mode: ___  Outlier: ___

2. Data: 83, 96, 91, 83, 78
   - List in order from least to greatest: ___, ___, ___, ___, ___
   - Median: ___  Mode: ___  Outlier: ______

3. Data: 56, 88, 100, 30, 96, 56, 92
   - List in order from least to greatest: ___, ___, ___, ___, ___, ___, ___
   - Median: ___  Mode: ___  Outlier: ___
Find the mode.

1. 9, 5, 4, 3, 4, 5, 7, 5 ______
2. 1, 2, 3, 5, 6, 4, 6, 7, 6 ______
3. 6, 4, 2, 1, 2, 4, 8, 4 ______
4. 3, 1, 5, 4, 3, 3, 1, 7, 6 ______

Find the median.

5. 4, 5, 1, 3, 3 ______
6. 8, 5, 4, 3, 6 ______
7. 2, 4, 1, 6, 7, 7, 3 ______
8. 1, 9, 3, 8, 7, 8, 1 ______

Identify the outlier in the data set.

9. 3, 5, 7, 9, 4, 20 ______
10. 9, 10, 3, 12, 11 ______
11. 16, 14, 13, 11, 10, 40 ______
12. 8, 9, 1, 11, 12, 10 ______

Find the mode and median of the data set. Identify any outliers.

13. Pennies Found on the Sidewalk

<table>
<thead>
<tr>
<th>Day</th>
<th>Pennies Found</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

Mode: ______
Median: ______
Outlier(s): ______
Find the mode and median of the set of data. Identify any outliers.

1. Movie ticket prices

<table>
<thead>
<tr>
<th>Theaters</th>
<th>Plex</th>
<th>Multi</th>
<th>Cine</th>
<th>Matinee</th>
<th>Center</th>
<th>Theater</th>
<th>Main</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$8</td>
<td>$9</td>
<td>$9</td>
<td>$9</td>
<td>$8</td>
<td>$7</td>
<td>$6</td>
</tr>
</tbody>
</table>

Mode: _______  Median: _______  Outlier: _______

2. Scores in basketball games

<table>
<thead>
<tr>
<th>Game</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>45</td>
<td>57</td>
<td>62</td>
<td>59</td>
<td>57</td>
<td>55</td>
<td>60</td>
</tr>
</tbody>
</table>

Mode: _____  Median: ____  Outlier: ____

Spiral Review

Organize the data in a tally chart and a frequency table.
(Lesson 4–1)

3. Katherine watched students choose lunch from among four choices. Here is what she saw. Make a tally chart and frequency table of Katherine’s data.

**Lunch Choices:** pizza, salad, taco, pizza, sandwich, salad, taco, taco, pizza, taco, sandwich, taco, salad, pizza, taco, sandwich, salad, taco, pizza, taco, salad, pizza, sandwich, taco, pizza, taco, salad, taco, pizza

<table>
<thead>
<tr>
<th>Lunch</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency Table:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Homework Practice

Find Mode, Median, and Outliers

4–2
Use data from the table to solve.

1. Find the **median** and the **mode** of the data.

2. What is the difference between the greatest temperature and the least temperature?

3. Which three states have the same normal temperature in January?

4. Are there any outliers in this data? Explain.

5. Find the median and mode for the five states with the **lowest** temperature.

6. Find the median and mode for the five states with the **highest** temperature.
The following table shows the 10-year average high and low temperatures for the town of Mitburg, USA. Use the information in the table to answer the following questions.

<table>
<thead>
<tr>
<th>Date</th>
<th>High/Low Average Temperature (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1</td>
<td>68/54</td>
</tr>
<tr>
<td>May 2</td>
<td>69/56</td>
</tr>
<tr>
<td>May 3</td>
<td>70/56</td>
</tr>
<tr>
<td>May 4</td>
<td>72/57</td>
</tr>
<tr>
<td>May 5</td>
<td>72/58</td>
</tr>
<tr>
<td>May 6</td>
<td>71/57</td>
</tr>
<tr>
<td>May 7</td>
<td>73/59</td>
</tr>
<tr>
<td>May 8</td>
<td>73/59</td>
</tr>
<tr>
<td>May 9</td>
<td>74/59</td>
</tr>
<tr>
<td>May 10</td>
<td>74/60</td>
</tr>
<tr>
<td>May 11</td>
<td>74/60</td>
</tr>
<tr>
<td>May 12</td>
<td>74/61</td>
</tr>
<tr>
<td>May 13</td>
<td>75/61</td>
</tr>
</tbody>
</table>

1. What is the median high temperature? ____

2. What is the mode among the low average temperatures? ____

3. What is the mode among the high average temperatures? ____

4. What is the difference between the high and low temperature on May 6? ____

5. Change the average high temperature for May 6 to 82°. Now what is the mode and median for the temperatures? mode ____ median ____

Did they change? Why or why not?
Which type of fish has the greatest number of varieties listed in the chart?

**Varieties of Tetras, Goldfish, and Angelfish**

<table>
<thead>
<tr>
<th>Black Neon Tetra</th>
<th>Fantail Goldfish</th>
<th>Lionhead Goldfish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Moor Goldfish</td>
<td>White Skirt Tetra</td>
<td>Diamond Tetra</td>
</tr>
<tr>
<td>Gold Angel</td>
<td>Silver Dollar Tetra</td>
<td>Silver Angel</td>
</tr>
<tr>
<td>Lemon Tetra</td>
<td>Marble Angel</td>
<td></td>
</tr>
</tbody>
</table>

**Step 1. Understand**

**Be sure you understand the problem.**

Read carefully.

What do you know?
- There are different varieties of , , and .

What do you need to find?
- You need to know how many different varieties of , , and are listed.

**Step 2. Plan**

- Make a Table or List
- Work Backward
- Find a Pattern
- Guess and Check
- Solve a Simpler Problem
- Write a Number Sentence
- Act It Out
- Make a Graph
- Use Logical Reasoning
- Draw a Picture

**Make a plan.**

Choose a strategy.
A table can help you organize what you know.
Make a table to solve the problem.
Step 3. Solve

Carry out your plan.

Make a table.

Tally the number of ______________ for each fish. Write a number for each set of tallies. Compare the numbers.

Complete the table.

<table>
<thead>
<tr>
<th>Type of Fish</th>
<th>Tally of Different Varieties</th>
<th>Total Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetras</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goldfish</td>
<td>III</td>
<td>3</td>
</tr>
<tr>
<td>Angelfish</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are ____ different kinds of tetras.
There are ____ different kinds of goldfish.
There are ____ different kinds of angelfish.
There are more varieties of _________ than either of the other two kinds of fish.

Step 4. Check

Is the solution reasonable?

Reread the problem.

Does your answer match the data given in the problem?

Practice

1. Jack lists the fish in his aquarium. He has a fantail goldfish, a lionhead goldfish, a gold angel angelfish, a lemon tetra, and a black neon tetra. Of which type of fish does Jack have the least?
Solve. Use the make a table strategy.

<table>
<thead>
<tr>
<th>Favorite Kind of Pet</th>
<th>Elliot—dog</th>
<th>Howard—dog</th>
<th>Jane—bird</th>
<th>Rebecca—bird</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marion—cat</td>
<td>Noriko—bird</td>
<td>Teri—cat</td>
<td>Melanie—cat</td>
<td></td>
</tr>
<tr>
<td>Tina—hamster</td>
<td>Yolanda—dog</td>
<td>Sarah—cat</td>
<td>Traci—dog</td>
<td></td>
</tr>
<tr>
<td>Paula—fish</td>
<td>Barry—cat</td>
<td>Bruce—dog</td>
<td>Noreen—fish</td>
<td></td>
</tr>
<tr>
<td>Sam—cat</td>
<td>Juan—dog</td>
<td>Mike—cat</td>
<td>Sylvia—cat</td>
<td></td>
</tr>
</tbody>
</table>

1. Which pet got the most votes? _____
2. Which pet got the fewest votes? __________
3. Marla earns $5 for mowing a lawn. If she mows 5 lawns a week for 4 weeks, how much money will she earn?  
   ________________________________________________________________
4. Devin’s parents bought a computer for $1,800. If they pay $180 each month, how many months will it take them to pay for the computer?  
   ________________________________________________________________
5. Shondra invites 15 of her friends over for yogurt. Nine of them want strawberry, five of them want vanilla. How many of Shondra’s friends want a flavor other than strawberry or vanilla?  
   ________________________________________________________________
6. Aaron is having a birthday party and he wants to make gift bags for his friends. If he invites 10 friends and includes 4 items in each bag, how many total items does he need?  
   ________________________________________________________________
7. If James earns $6 per hour, how many hours per week does he work if he makes $360 every 2 weeks?  
   ________________________________________________________________
8. Write a problem where make a table would help you to solve it.  
   ________________________________________________________________
4–3

Homework Practice

Problem-Solving Strategy

Solve. Use the make a table strategy.

1. Rosa knits sweaters to sell. Each sweater takes 4 balls of yarn. How many balls of yarn will she need to make 8 sweaters?

2. Each ball of yarn costs $6. How much money will Rosa earn selling all 8 sweaters if she sells each sweater for $35? Remember, she has to pay for the yarn she used to make the sweaters.

3. Josh is a photographer. For every 7 pictures he takes, he has one portrait he can sell for $15. If Josh made $180 selling portraits, how many photographs did he take?

4. Hannah practices her gymnastics routine 12 times at each practice. If she practices 5 days a week, about how many times does Hannah practice her routine in 4 weeks?

Spiral Review

Find the mode and median of the set of data. Identify any outliers. (Lesson 4–2)

5. Students absent because of the flu

<table>
<thead>
<tr>
<th>Month</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>25</td>
</tr>
<tr>
<td>October</td>
<td>125</td>
</tr>
<tr>
<td>November</td>
<td>125</td>
</tr>
<tr>
<td>December</td>
<td>175</td>
</tr>
<tr>
<td>January</td>
<td>175</td>
</tr>
<tr>
<td>February</td>
<td>225</td>
</tr>
<tr>
<td>March</td>
<td>175</td>
</tr>
</tbody>
</table>

Mode: _____
Median: _____
Outlier: _____

6. Average travel time to school

<table>
<thead>
<tr>
<th>Student</th>
<th>Javier</th>
<th>Daniel</th>
<th>Lourdes</th>
<th>Kayla</th>
<th>William</th>
<th>Amber</th>
<th>Kyle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>10</td>
<td>15</td>
<td>10</td>
<td>20</td>
<td>10</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

Mode: _____
Median: _____
Outlier: _____
Enrich
Counting Critters

Half of the critters in the backyard are spiders, and they all have eight legs. The rest are six-legged insects. If there are 56 critter legs in the backyard, how many critters are there?

Complete this table and use it to solve the problem.

<table>
<thead>
<tr>
<th>Critters</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spider Legs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insect Legs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Half of the animals in a backyard are dogs and they all have four legs. The rest are two-legged birds. If there are 24 animal legs in the backyard, how many animals are there?

<table>
<thead>
<tr>
<th>Animals</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog Legs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bird Legs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A line plot is another way to organize data. Line plots are a lot like tally charts. In line plots, you use Xs above a number line instead of tally marks next to a category. Line plots are used when you want to chart how often a certain number occurs in your data.

Students riding afterschool bus:

<table>
<thead>
<tr>
<th>Day</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>11</td>
</tr>
<tr>
<td>Tuesday</td>
<td>20</td>
</tr>
<tr>
<td>Wednesday</td>
<td>22</td>
</tr>
<tr>
<td>Thursday</td>
<td>20</td>
</tr>
<tr>
<td>Friday</td>
<td>21</td>
</tr>
</tbody>
</table>

Mode: 20  
Median: 20  
Outlier: 11

Organize the set of data in a line plot.

1. Number of students in each classroom:

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs. Connolly</td>
<td>27</td>
</tr>
<tr>
<td>Mr. Martinez</td>
<td>32</td>
</tr>
<tr>
<td>Mrs. Jones</td>
<td>29</td>
</tr>
<tr>
<td>Mr. Washington</td>
<td>30</td>
</tr>
<tr>
<td>Mrs. Gematti</td>
<td>31</td>
</tr>
<tr>
<td>Mrs. Norris</td>
<td>29</td>
</tr>
<tr>
<td>Mr. Calderone</td>
<td>29</td>
</tr>
<tr>
<td>Mrs. Abalon</td>
<td>31</td>
</tr>
<tr>
<td>Mr. Selfani</td>
<td>36</td>
</tr>
</tbody>
</table>

Identify the mode, median, and outliers for the data set.

2. Number of students in classroom.

Mode: _______________  
Median: _______________  
Outlier: _______________
Organize each set of data in a line plot.

1. Number of fans at the football game:

<table>
<thead>
<tr>
<th>Game</th>
<th>Fans</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>49,000</td>
</tr>
<tr>
<td>2</td>
<td>47,000</td>
</tr>
<tr>
<td>3</td>
<td>52,000</td>
</tr>
<tr>
<td>4</td>
<td>50,000</td>
</tr>
<tr>
<td>5</td>
<td>51,000</td>
</tr>
<tr>
<td>6</td>
<td>52,000</td>
</tr>
<tr>
<td>7</td>
<td>52,000</td>
</tr>
<tr>
<td>8</td>
<td>48,000</td>
</tr>
<tr>
<td>9</td>
<td>36,000</td>
</tr>
</tbody>
</table>

2. Points scored by the home team at each football game:

<table>
<thead>
<tr>
<th>Game</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>31</td>
</tr>
<tr>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>9</td>
<td>35</td>
</tr>
</tbody>
</table>

Identify the mode, median, and outliers for the data set.

3. Number of fans at the football game.
   - Mode: ______________
   - Median: ______________
   - Outlier: ______________

4. Number of points scored by the home team at each football game.
   - Mode: ______________
   - Median: ______________
   - Outlier: ______________
Organize each set of data in a line plot.

1. Number of books checked out per person at the library.

<table>
<thead>
<tr>
<th>Number of Books</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Number of homeruns hit per game.

<table>
<thead>
<tr>
<th>Game</th>
<th>Homeruns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>

Identify the mode, median, and any outliers for the data set.

3. Number of books checked out per person.
   Mode: _____  Median: _____  Outlier: _____

4. Number of homeruns hit per game.
   Mode: _____  Median: _____  Outlier: ________________

Spiral Review

Solve. (Lesson 4-3)

5. Aaron is selling popcorn to raise money for the band. He sells 1 box of popcorn for every 3 houses he visits. How many houses will he need to visit to sell 9 boxes of popcorn? ________________

6. Kimberly babysits 3 hours on weekends. For every 3 hours she works, she earns $25. If she wants to earn $165, how many weekends must she work? ________________

7. If Kimberly starts working 5 hours on weekends and earns $42, how many weekends must she work to earn the $165?
Jennifer wants to know how hard her friends thought the extra credit math problem was. She asked them how many tries it took them to solve the problem. She made a chart of her information.

<table>
<thead>
<tr>
<th>Friends</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dylan</td>
<td>3</td>
</tr>
<tr>
<td>Allison</td>
<td>5</td>
</tr>
<tr>
<td>Jose</td>
<td>12</td>
</tr>
<tr>
<td>Olivia</td>
<td>4</td>
</tr>
<tr>
<td>Jesse</td>
<td>6</td>
</tr>
<tr>
<td>Chelsea</td>
<td>4</td>
</tr>
<tr>
<td>Logan</td>
<td>6</td>
</tr>
<tr>
<td>María</td>
<td>7</td>
</tr>
<tr>
<td>Trevor</td>
<td>4</td>
</tr>
</tbody>
</table>

1. Organize the data in a line plot.
2. How many tries was the most common answer? __________
3. What was the median number of tries? __________
4. One friend’s answer was very different from the other friends. How many tries did the one very different friend take? __________

Hunter wants to know how old his classmates were when they learned how to swim. He took a survey and made a chart of his data:

5. What age was the most common age to learn to swim? ____
6. What ages had the same number of students learn to swim? __________________________
7. What age was very different from all the other students’ ages? __________________________
Enrico and James ride the bus to and from school. To pass the time, they had a contest to see how many out-of-state license plates each of them could spot each day. Here is the data they collected for two weeks.

Enrico: 7, 3, 13, 9, 6, 7, 10, 7, 5
James: 8, 3, 12, 8, 5, 7, 9, 12, 0, 7

Use two different colors to make line plots for Enrico and James on the graphs below. Then answer the questions.

1. What is the difference between the greatest number of out-of-state plates seen by Enrico and the least number seen by Enrico?

2. Who spotted the most out-of-state license plates?

3. Looking at the data for both boys, what number is the mode? ____

4. What might explain James’ data for seeing 0 plates on one day?

______________________________

______________________________

______________________________

______________________________
You can use single bar graphs or double bar graphs to show data. A single bar graph presents one set of data. A double bar graph presents two sets of data.

When you create a double bar graph, you need to make a key to represent each set of data. Write a title and headings for the vertical and horizontal sides. Select a scale just as you would for a single bar graph. Remember to include different headings for both sets of data.

For Exercises 1–4, use the graphs shown.

1. What is the favorite vacation spot? How many people chose it?

2. Did more people choose France, Hawaii, or Greece as their favorite vacation spot? _______

3. How many more boys than girls chose Hawaii as their favorite vacation spot? _______

4. Which vacation spot shows the greatest difference between boys and girls? _______
For Exercises 1–3, use the bar graph below.

1. What is the favorite sport? _________
2. What is the least favorite sport? _________
3. How many more people prefer soccer to football? _____

For Exercises 4–6, use the bar graph below.

4. How many total students have voted for student body president? ________________________
5. Which candidate is the winner of the election?

(Answer)

6. How many more votes did David need to win the election? ____________
For Exercises 1–3, use the bar graph below.

This graph shows the number of students using the school gym after school.

1. Which day had the most number of students using the gym?

2. Did more girls or boys use the gym after school?

3. Estimate how many boys used the gym.

Organize the set of data in a line plot. (Lesson 4-4)

4. Number of books checked out per person at the library.

<table>
<thead>
<tr>
<th>Number of Books</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>19</td>
<td>1</td>
</tr>
</tbody>
</table>

Identify the mode, median, and any outliers for the data set.

5. Number of books checked out per person.

   Mode: ____
   Median: ____
   Outlier: ____
For Exercises 1–2, use the bar graph below.

**Class Election Results**

<table>
<thead>
<tr>
<th>Student</th>
<th>Number of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Josh</td>
<td>6</td>
</tr>
<tr>
<td>Ada</td>
<td>1</td>
</tr>
<tr>
<td>Megan</td>
<td>4</td>
</tr>
<tr>
<td>Roger</td>
<td>2</td>
</tr>
<tr>
<td>Liam</td>
<td>5</td>
</tr>
</tbody>
</table>

1. How many more votes did Josh get than Roger? Explain how you know. ____________________________

2. How many votes did Ada and Roger get? Explain how you know. ________________________________

Use a separate sheet of paper to make a bar graph. Then solve.

3. Maurice made a bar graph to show the number of people wearing sneakers, boots, and regular shoes in his classroom. Fifteen students are wearing sneakers. Eight are wearing regular shoes, and six students are wearing boots. Make a bar graph to show the data. How many students are in Maurice’s class? ________________________________

4. Betina looked at Maurice’s bar graph. She guessed that the number of students who are wearing regular shoes and boots is greater than the number of students wearing sneakers. Is Betina’s guess correct? _____
   Explain. __________________________________________
This graph shows the results of a reading contest at Jefferson Elementary School. Third and fourth graders kept track of the average number of books read by students for three months. Use the graph to complete the table below.

Title: ____________________________

<table>
<thead>
<tr>
<th>Month</th>
<th>Grade Level</th>
<th>Average Number of Books Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td></td>
<td></td>
</tr>
<tr>
<td>February</td>
<td></td>
<td></td>
</tr>
<tr>
<td>March</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Choose a Strategy

There are many ways to solve most math problems. You will decide which strategy works best for you when you read the problems. Here are problem-solving strategies and tips on when to use them.

Draw a picture: This strategy can help you look at the information in the problem a different way—useful when the problem is about distance or location.

Look for a pattern: This strategy can help you solve problems when the input changes.

Make a table: This strategy can help you solve problems that have a lot of information to organize.

Use this problem to learn more about choosing a strategy: Erin wants to buy bracelets for each of her friends. Each bracelet costs $3.50. If she has $25, how many bracelets can she buy?

<table>
<thead>
<tr>
<th>Understand</th>
<th>You know that 1 bracelet costs $3.50. You know she has $25. You need to find out how many bracelets she can buy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>Choose a strategy. This problem has a lot of information that you must use to solve it. A table is a good way to organize information you have. Make a table to solve the problem.</td>
</tr>
<tr>
<td>Solve</td>
<td><strong>Bracelets</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Cost of Bracelets</strong></td>
</tr>
<tr>
<td></td>
<td>You know how much 1 bracelet costs. You can fill in the chart to find out how many bracelets $25 can buy. Erin can buy 7 bracelets.</td>
</tr>
</tbody>
</table>
Check | Look back at the problem. Check to see if you are correct:
7 bracelets cost $24.50.
8 bracelets cost $28.00.
$28 is more than $25.
$25 is more than $24.50.
Your answer is correct.

Problem-Solving Investigation

Use any strategy shown below to solve. Tell what strategy you used.

• Draw a picture
• Look for a pattern
• Make a table

1. Notebooks come with 50 pieces of paper. There are 32 students in class. If each student uses 5 pieces of paper, how many notebooks does the class need?

Strategy: ____________________________

2. Each batch of dough makes 6 rolls. If Sam wants to make 32 rolls, how many batches of dough will he need?

Strategy: ____________________________

3. Gabrielle is decorating cubes for her room. If she puts four cubes together against a wall and wants a different color on each visible side, how many different colors will she need?

Strategy: ____________________________

4. Laura is making a picnic. For every person coming to the picnic, she must have 2 sandwiches, 4 drinks, and 10 pretzels. If 4 people come to the picnic, how many food items will she need?

Strategy: ____________________________
Skills Practice

Problem-Solving Investigation

Use any strategy shown below to solve. Tell what strategy you used.

• Draw a picture
• Look for a pattern
• Make a table

1. Admission to the skate park is $4 per child and $10 per adult. If Kristen’s father brings Kristen and her friends to the skate park, how many friends can Kristen bring if they have $40 to spend?

   Strategy: ________________________________________________

2. At the class party, each student brings two guests. If there are 45 people at the party, how many are students? ________________

   Strategy: ________________________________________________

3. Connor is making squares out of toothpicks. Each square is formed from 4 toothpicks. If he has 13 toothpicks, how many squares can he build? __________________________

   Strategy: ________________________________________________

4. Richard’s class was collecting clothes to donate to the shelter. Richard brought 4 pieces. Jackie and Kelly each brought 6 pieces. Hunter brought 7 pieces, and Tim brought 5 pieces. How many pieces of clothing did Richard’s class collect?

   Strategy: ________________________________________________

5. Marissa is making a necklace. She uses these beads: blue, blue, purple, green, blue, blue… What color bead is next if this pattern continues? __________

   Strategy: ________________________________________________

6. Copy and complete the number pattern.

   6, 9, 11, 14, 16, ____, ____ , ____ , ____

   Strategy: ________________________________________________
Use any strategy shown below to solve. Tell what strategy you used.

- Draw a picture  
- Look for a pattern  
- Make a table

1. Each night, Sabrina spends 15 minutes more doing homework than her sister Tiffany. If Tiffany spends 50 minutes in a 5-day week doing homework, how many minutes does Sabrina spend doing homework in that same week? _________________________
   Strategy: _________________________

2. Caleb is organizing his shirts. He is following a pattern: white, blue, white, red, white, blue… What color is next if this pattern continues? _________________________
   Strategy: _________________________

3. Corey has 56 people to whom he would like to send a card. If the cards come in packages of 6, how many packages does he need to buy? _________________________
   Strategy: _________________________

Spiral Review

For Exercises 4–6, use the graph shown.

(Lesson 4–5)

4. Which river is the longest? __________

5. About how long is the Yangtze River? __________

6. Estimate the difference in length between the Nile and the Amur Rivers. _________________________
Find a list of all the presidents and use this table to tally the most common last initials among the presidents. Then use the data to make a bar graph of the top four most common initials.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td></td>
</tr>
</tbody>
</table>

Before 2009, what was the most common first letter for the last names of U.S. Presidents? _____
Reteach
Interpret Line Graphs

A line graph can be used to explain information.

The table below shows the number of CDs sold last week. You can make a line graph to show the number of CDs sold each day.

<table>
<thead>
<tr>
<th>CD Sales</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Day</td>
<td>Number</td>
</tr>
<tr>
<td>Monday</td>
<td>15</td>
</tr>
<tr>
<td>Tuesday</td>
<td>10</td>
</tr>
<tr>
<td>Wednesday</td>
<td>30</td>
</tr>
<tr>
<td>Thursday</td>
<td>50</td>
</tr>
<tr>
<td>Friday</td>
<td>45</td>
</tr>
<tr>
<td>Saturday</td>
<td>70</td>
</tr>
<tr>
<td>Sunday</td>
<td>60</td>
</tr>
</tbody>
</table>

Show the data from the table in the line graph.

- On Monday, 15 CDs were sold. Place a point above Monday and across from 15.
- Place a point for the sales for each of the other days.
- Connect the points with straight lines.

For Exercises 1–4, use the line graph above.

1. On which day were the most CDs sold? ____________
2. What is the difference between the highest number sold and the lowest number sold? ____ – ____ = ____
3. Did sales increase or decrease from Friday to Saturday?
   ___________________________________________________
4. Did sales increase or decrease from Thursday to Friday?
   ___________________________________________________
For Exercises 1–3, use the line graph.

1. In what week did Damien receive the lowest score on a quiz?

2. In what weeks did Damien receive the second highest score on a quiz?

3. In what week did Damien most improve his quiz score?

Make a line graph that displays the data. Then answer the questions.

4. Michelle wants to see how much of a profit her lemonade stand has made between the months of May and September. In May, she made $5, in June $13, in July $12, $14 in August, and $7 in September.

5. How much of a gain did Michelle see from May to July?

6. In what month did Michelle see the sharpest drop in profit?
For Exercises 1–5, use the graph that shows the number of students completing their homework.

1. On what day did the greatest number of students complete their homework? ________________
2. How many students completed their homework on Tuesday? ________________
3. On what day did the least number of students complete their homework? ________________
4. How many more students completed their homework on Monday than on Wednesday? ________________
5. What is the total number of students completing their homework on Tuesday and Friday? ________________

Spiral Review  Use any strategy shown below to solve. Tell what strategy you used (Lesson 4–6).

- Look for a Pattern  - Draw a Picture  - Make a Table

6. Emma can borrow tables for her party. Each table can seat 6 guests. If she invites 45 people, how many tables will she need?

_____________ Strategy: __________________________________________

7. The Pizza Palace sells 2 pizza slices for $3.00, 3 pizza slices for $4.50, and 4 pizza slices for $6.00. At this rate, what is the cost of 1 slice of pizza?

_____________ Strategy: __________________________________________
For Exercises 1–2, use the line graph.

1. Use the line graph to answer this question. What is the greatest number of students at Drama Club meetings? least?

2. The first meeting on the line graph was the first Monday in January. Did attendance decrease or increase after the beginning of the year?

Use a separate sheet of paper to make a line graph. Then solve.

Make a line graph of the data. Title it, “Days Jon Practiced Piano.”

<table>
<thead>
<tr>
<th>Month</th>
<th>Days Practiced</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>17</td>
</tr>
<tr>
<td>August</td>
<td>15</td>
</tr>
<tr>
<td>September</td>
<td>12</td>
</tr>
<tr>
<td>October</td>
<td>13</td>
</tr>
<tr>
<td>November</td>
<td>12</td>
</tr>
<tr>
<td>December</td>
<td>19</td>
</tr>
</tbody>
</table>

3. During which month did Jon practice the greatest number of days? _____________

4. During which two months did Jon practice the fewest number of days? ____________________________
This graph shows the rise and fall of the temperature in Nashville, TN for one day. Use it to write questions for the answers given below.

1. The answer is 75°F.

2. The answer is between midnight and 9 A.M.

3. The answer is about 62°.

4. The answer is no.
Reteach

Analyze Graphs

Different types of graphs are used to show different types of data.

A line plot is used to display a single set of data.

Ages of chess club Members

A bar graph can also be used to display a single set of data.

<table>
<thead>
<tr>
<th>Ages of chess club Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 10 11 12</td>
</tr>
</tbody>
</table>

A line graph is the best way to display change over time.

<table>
<thead>
<tr>
<th>Outside Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (F)</td>
</tr>
<tr>
<td>9:00 AM 10:00 AM 11:00 AM 12:00 PM</td>
</tr>
<tr>
<td>0 5 10 15 20 25 30</td>
</tr>
</tbody>
</table>

For Exercises 1–2, use the bar graph above.

1. In which month was the greatest number of videos rented?
   ____________________________

2. About how many more videos were rented in August than September?
   ____________________________

For Exercises 3–4, use the line graph above.

3. What was the temperature outside at 9:00 A.M.? __________________

4. How many degrees warmer was it at 12:00 than it was at 10:00? __________________
Skills Practice

Analyze Graphs

For Exercises 1–2, use the line graph.

1. Which day was warmest? ______________

2. If the pattern continues, what will be the temperature on Monday? _____

For Exercises 3–5, use the bar graph.

3. How many total votes are there? ______________________

4. How many more people prefer to read a book than do extra homework? ______________________

5. What is the second most popular way to spend a rainy afternoon? ______________________
Homework Practice

Analyze Graphs

For Exercises 1–4, use the bar graph.

1. Which day did Ronaldo’s sell the most pizzas? ________________
2. How many pizzas were sold on Thursday? ________________
3. What was the total number of pizzas sold on Monday and Tuesday? ________________
4. How many more pizzas were sold on Saturday than Wednesday? ________________

For Exercises 5–8, use the graph. (Lesson 4–7).

5. Which hour had the greatest number of riders? ________________
6. How many people rode the bus at 3:00? ________________
7. Which two hours had a combined 125 riders? ________________
8. How many more people rode the bus at 7:00 than at 10:00? ________________
Problem-Solving Practice

Analyze Graphs

Determine the best graph to show the data.

1. You ask your friends about their favorite kinds of books. You want to show the data. Should you make a bar graph or a line plot?

2. Your family takes a vacation. You write down the number of miles you drive each day. Then, you want to make a graph that shows this data. Should you make a line graph or a line plot?

3. You want to make a graph of your math test scores. Choose the best type of graph for the data. Explain your choice.

4. You want to make a graph that shows the number of times you have ridden your bicycle in the last six weeks. Choose the best type of graph for the data. Explain your choice.

5. Julio wants to make a graph that shows the profits from his paper route during the past year. Which type of graph should he make? Explain why.

6. Kim wants to make a graph that shows the scores of her softball team’s games and the scores of the teams they have played this season. Which is the best type of graph to make for the data? Explain why.
Sometimes the same data can be used to print very different pictures, depending on which type of graph is used. Study the graphs above, then answer the questions below.

1. Do both bar graphs show the same data? ______

2. What is the main difference between the two graphs?

3. Which graph do you think the salesperson showed her boss? Explain why.
# Individual Progress Checklist

<table>
<thead>
<tr>
<th>B</th>
<th>D</th>
<th>M</th>
<th><strong>Goal</strong></th>
<th><strong>Progress</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>identify the mode of a set of data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>identify the median of a set of data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>identify the outlier of a set as data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>read and interpret data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>collect and represent data on a number line</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>collect and represent data in graphs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>collect and represent data in tables</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>collect and represent data in charts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>solve problems by making a table</td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

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Chapter Diagnostic Assessment

Order from least to greatest.

1. 14, 18, 15, 11, 13
2. 25, 64, 38, 49, 55
3. 16, 52, 34, 21, 31
4. 87, 76, 47, 54, 28

Add or subtract.

5. 31 + 24
6. 53 + 15
7. 79 − 26
8. 82 − 36

Find the value of n.

9. 25 + 46 = n
10. 73 − 14 = n

Use the graph to answer each question.

11. In which month were the least number of videos rented?
12. How many videos were rented in August?
Chapter Pretest

Find the mode and median of the set of data. Identify any outliers.

1. Data set: 2, 64, 76, 87, 98, 99, 99,

2. Data set: 2, 7, 2, 5, 5, 2, 2, 5, 5, 6, 9, 2, 2

Solve. Use the make a table strategy.

3. The state sales tax is $0.08 for every dollar spent. If Pietro spends $0.48 in tax on his purchase, what was the cost of the items he bought? __________

4. Dalila scored 16 points in a basketball game. For every 4 shots she took, she made 1 basket (1 basket earns 2 points). How many shots did Dalila attempt during the whole game? ______________

Organize the data in a line plot.

5. Ages of students in band practice: 7, 6, 8, 10, 7, 10, 9, 10

For Exercises 6–8 use the line graph below.

6. On what day were the least CDs sold? ______________

7. How many more CDs were sold on Sunday than on Monday? ______________

8. What was the total number of CDs sold during the weekend? ______________
Quiz 1 (Lessons 4-1 through 4-3)

Read each question carefully. Write your answer in the space provided.

1. Jacob was curious about the heights of adults in his neighborhood. He asked the adults what height category they fit in. He kept a tally chart of his information. Place his data on a frequency table.

<table>
<thead>
<tr>
<th>Height Category</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>4’8”–5’0”</td>
<td>1</td>
</tr>
<tr>
<td>5’1”–5’5”</td>
<td>3</td>
</tr>
<tr>
<td>5’6”–5’10”</td>
<td>4</td>
</tr>
<tr>
<td>5’11”–6’3”</td>
<td>2</td>
</tr>
</tbody>
</table>

2. What is the most common height category for people in Jacob’s neighborhood? _________________

3. How many more adults are in the 5’1”–5’5” category than the 5’11”–6’3” category? _____

Find the mode and median of the set of data. Identify any outliers.

Most Popular Dog Breeds

<table>
<thead>
<tr>
<th>Breed</th>
<th>Approx. Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labrador Retriever</td>
<td>140,000</td>
</tr>
<tr>
<td>Golden Retriever</td>
<td>50,000</td>
</tr>
<tr>
<td>Yorkshire Terrier</td>
<td>50,000</td>
</tr>
<tr>
<td>German Shepherd</td>
<td>40,000</td>
</tr>
<tr>
<td>Beagle</td>
<td>40,000</td>
</tr>
<tr>
<td>Dachshund</td>
<td>40,000</td>
</tr>
<tr>
<td>Boxer</td>
<td>40,000</td>
</tr>
</tbody>
</table>

4. Mode: __________  5. Median: __________

6. Identify the outlier of the data. __________
Quiz 2  (Lessons 4-4 through 4-6)

For Exercises 1-3, use the data set below.

Number of Children Per Family in My Neighborhood

<table>
<thead>
<tr>
<th>No. Children</th>
<th>No. Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

1. How many families have 2 children? ______________
2. Identify the mode and median. ______________
3. Identify any outliers. ______________

For Exercises 4–6, use the double bar graph.

4. Which month has the lowest average temperatures? ______________
5. Does Los Angeles or San Francisco have higher temperatures? ______________
6. Estimate the difference in temperatures in July. ______________

Solve.

7. Alicia buys some CDs. The price of one CD is $9. If she paid $36 in total, how many CDs did she buy? ______________
For Exercises 1–3, use the line graph that shows the number of birthdays by season.

1. In what season are the most birthdays? 
2. How many birthdays are in Fall? 
3. How many more birthdays are there in Spring than in Winter? 

For Exercises 4–6, use the bar graph that shows the number of people Anna saw on her way to school who are walking their dogs.

4. Which day did Anna see the most people walking dogs? 
5. How many dogs were walked on Thursday? 
6. How many more dogs were walked on Friday than on Wednesday?
Mid-Chapter Review

Read each question carefully. Write your answer in the space provided.

1. Andy watched people walk by and kept track of what color each person’s hair was. Here is what he saw:
   brown, blonde, brown, black, red, brown, brown, black, blonde, brown, black, brown, blonde, brown, black, blonde, red, brown. Make a tally table of the data.

2. What was the most common hair color Andy saw?

3. Identify the mode of the data: 7, 8, 7, 5, 5, 4, 5

Solve. Use the make a table strategy.

4. Christina is packing for a camping trip. She knows that for every person going on the trip, she needs to bring 4 bottles of water. If she packs 30 bottles of water, what is the greatest number of people she can bring on the trip?

5. Identify the mode, median, and any outliers for the data set below.

<table>
<thead>
<tr>
<th>Day</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>18</td>
</tr>
<tr>
<td>Monday</td>
<td>35</td>
</tr>
<tr>
<td>Tuesday</td>
<td>32</td>
</tr>
<tr>
<td>Wednesday</td>
<td>35</td>
</tr>
<tr>
<td>Thursday</td>
<td>34</td>
</tr>
<tr>
<td>Friday</td>
<td>35</td>
</tr>
<tr>
<td>Saturday</td>
<td>33</td>
</tr>
</tbody>
</table>

Mode:

Median:

Outlier:
Match each word to its definition. Write your answer on the line provided.

1. data _____
   A. the number(s), that occurs most often in a set of numbers

2. double bar graph _____
   B. another word for information

3. line graph _____
   C. the middle number when a set of numbers is arranged from least to greatest

4. median _____
   D. a graph that uses points connected by line segments to represent data

5. mode _____
   E. a bar graph that compares two related groups of data
Place 7 pencils, 10 crayons, 4 erasers, 3 pieces of chalk, and 8 pieces of paper on the table. Create a chart to tally the amount of each object present.

Read each question aloud to the student. Then write the student’s answers on the lines below the question.

1. What does the chart indicate we have the most of?

2. What does the chart indicate we have the least of?

3. If you took away 3 crayons, what item would we have the most of?

4. Tell how you got your answer.

5. How many pieces of chalk would you have to add to make that the item we have the most of?

6. Explain your answer.
7. Chen asked his friends how much money they receive for an allowance. The responses were: $10, $8, $10, $10, $0, $5, $0, $20, $10. How many friends did Chen survey?


8. What is the median of the responses?


9. Prove your answer.


10. What is the mode of the responses?


11. Tell how you got your answer.


12. If 3 students changed their response from red to blue, would the median be the same? If not, what would it be?


13. Explain your answer.
## Chapter Project Rubric

<table>
<thead>
<tr>
<th>Score</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Student successfully completed the chapter project. Student demonstrated appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>2</td>
<td>Student completed the chapter project with partial success. Student partially demonstrated appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>1</td>
<td>Student did not complete the chapter project or completed it with little success. Student demonstrated very little appropriate use of chapter information in completing the chapter project.</td>
</tr>
<tr>
<td>0</td>
<td>Student did not complete the chapter project. Student demonstrated inappropriate use of chapter information in completing the chapter project.</td>
</tr>
</tbody>
</table>
Foldables Rubric

Statistics: Side Tab Foldables Data and Graphs

<table>
<thead>
<tr>
<th>Score</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Student properly assembled Foldables graphic organizer according to instructions. Student recorded information related to the chapter in the manner directed by the Foldables graphic organizer. Student used the Foldables graphic organizer as a study guide and organizational tool.</td>
</tr>
<tr>
<td>2</td>
<td>Student exhibited partial understanding of proper Foldables graphic organizer assembly. Student recorded most but not all information related to the chapter in the manner directed by the Foldables graphic organizer. Student demonstrated partial use of the Foldables graphic organizer as a study guide and organizational tool.</td>
</tr>
<tr>
<td>1</td>
<td>Student showed little understanding of proper Foldables graphic organizer assembly. Student recorded only some information related to the chapter in the manner directed by the Foldables graphic organizer. Student demonstrated little use of the Foldables graphic organizer as a study guide and organizational tool.</td>
</tr>
<tr>
<td>0</td>
<td>Student did not assemble Foldables graphic organizer according to instructions. Student recorded little or no information related to the chapter in the manner directed by the Foldables graphic organizer. Student did not use the Foldables graphic organizer as a study guide and organizational tool.</td>
</tr>
</tbody>
</table>
Chapter Test, Form 1

Read each question carefully. Write your answer on the line provided.

For Exercises 1–2 use the line plot below.
Coach Green recorded how many points each team member scored during the game.

Number of Points Scored

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

1. How many team members does the data set include?
   A. 5  B. 6  C. 15  D. 16

2. How many team members scored 2 points?
   F. 1  G. 3  H. 5  J. 6

For Exercises 3–5, use the set of data below.
Number of hours Koki listened to the radio:
2, 3, 2, 1, 4, 4, 1, 2, 9

3. What is the mode of this data set?
   A. 2  B. 3  C. 4  D. 9

4. Which number is an outlier in the data set?
   F. 1  G. 3  H. 4  J. 9

5. What is median of the data?
   A. 1  B. 2  C. 3  D. 4
For Exercises 6–8, use the double bar graph below.

![Double Bar Graph]

6. What is the total number of people surveyed?
   
   F. 5   G. 38   H. 40   J. 44

   6. ____

7. Which vacation spot is the favorite of the most boys and girls?
   
   A. Hawaii   B. Texas
   C. Florida   D. New York

   7. ____

8. How many girls say that Australia is their favorite vacation spot?
   
   F. 1   G. 2   H. 3   J. 5

   8. ____

For Exercises 9–10, use the line graph below.

![Line Graph]

9. How many fruit smoothies were sold in the month of October?
   
   A. 650   B. 700   C. 800   D. 900

   9. ____

10. How many more fruit smoothies were sold in August than December?
    
   F. 600   G. 700   H. 800   J. 900

   10. ____
Read each question carefully. Write your answer on the line provided.

For Exercises 1–4, use the line plot below.

Coach Brown recorded how many points each team member scored during the season.

Number of Points Scored

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

1. How many team members scored either 4 or 5 points?
   A. 1   B. 2   C. 3   D. 4

2. How many team members scored 1 point?
   F. 1   G. 3   H. 4   J. 5

3. What is the fewest amount of points any team member(s) scored?
   A. 1   B. 2   C. 3   D. 5

4. Identify the median of the data set.
   F. 1   G. 2   H. 3   J. 4

For Exercises 5–6, use the set of data below.

Money Alexis earned:
$7, $6, $4, $6, $9, $11, $13, $6, $4

5. What is the mode?
   A. $4   B. $6   C. $7   D. $13

6. What is the median?
   F. $6   G. $7   H. $9   J. $11
For Exercises 7–9, use the double bar graph below.

7. What is the total number of people surveyed?
   A. 5    B. 38    C. 39    D. 50

8. What vacation spot was the least favorite of the boys?
   F. Hawaii    G. California
   H. Florida    J. New York

9. Altogether, how many boys and girls say Texas is their favorite vacation spot?
   A. 2    B. 3    C. 4    D. 5

For Exercises 10–11, use the line graph below.

10. Which amount of toys were sold in the month of July?
    F. $1,000    G. $1,200    H. $1,700    J. $3,200

11. How many more dollars worth of toys were sold in December than in August?
    A. $2,200    B. $2,500    C. $3,200    D. $5,000

Chapter Test, Form 2A (continued)
Read each question carefully. Write your answer on the line provided.

For Exercises 1–4, use the line plot below.
Coach Lopez wrote down how many points each team member scored.

Number of Points Scored
\[
\begin{array}{cccccc}
\times & \times & \times & \times & \times & \times \\
1 & 2 & 3 & 4 & 5
\end{array}
\]

1. How many people scored 5 points?
   A. 1       B. 2       C. 3

2. How many people scored 1 point?
   F. 1       G. 4       H. 5

3. What is the fewest amount of points that anyone scored?
   A. 1       B. 3       C. 5

4. What is the median?
   F. 2       G. 3       H. 4

For Exercises 5–6, use the set of data below.
Money Joey earned:
$7, $6, $4, $6, $9, $8, $10, $6, $4

5. What is the mode?
   A. $4       B. $6       C. $7

6. What is the median?
   F. $6       G. $7       H. $9
For Exercises 7–9, use the double bar graph below.

```
<table>
<thead>
<tr>
<th>Favorite Vacation Spots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of People</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

Hawaii | Greece | Florida | France | Australia

- Boys
- Girls

7. How many people were surveyed altogether?
   A. 34  
   B. 44  
   C. 50  
7. ____

8. What place was the boys’ least favorite?
   F. Hawaii  
   G. Florida  
   H. France  
8. ____

9. Added together, how many boys and girls say Australia is their favorite place?
   A. 3  
   B. 4  
   C. 5  
9. ____

For Exercises 10–11, use the line graph below.

```
<table>
<thead>
<tr>
<th>Toys Sold at Toy City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
</tr>
<tr>
<td>$0</td>
</tr>
<tr>
<td>$1,000</td>
</tr>
<tr>
<td>$1,200</td>
</tr>
<tr>
<td>$1,400</td>
</tr>
<tr>
<td>$1,600</td>
</tr>
<tr>
<td>$1,800</td>
</tr>
<tr>
<td>$2,000</td>
</tr>
<tr>
<td>$2,200</td>
</tr>
<tr>
<td>$2,400</td>
</tr>
<tr>
<td>$2,600</td>
</tr>
<tr>
<td>$2,800</td>
</tr>
<tr>
<td>$3,000</td>
</tr>
<tr>
<td>$3,200</td>
</tr>
</tbody>
</table>

Month |
July  |
Aug.  |
Sept. |
Oct.  |
Nov.  |
Dec.  |

10. What amount of toys were sold in July?
    F. $1,000  
    G. $1,200  
    H. $1,700  
10. ____

11. How many more dollars worth of toys were sold in December than in August?
    A. $2,200  
    B. $2,500  
    C. $3,200  
11. ____
Chapter Test, Form 2C

Read each question carefully. Write your answer on the line provided.

For Exercises 1–4, use the line plot below.

<table>
<thead>
<tr>
<th>Number of Hours of Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>X X</td>
</tr>
<tr>
<td>X X X X</td>
</tr>
<tr>
<td>X X X X X X</td>
</tr>
<tr>
<td>X X X X X X X X</td>
</tr>
</tbody>
</table>

1. How many students worked for exactly 1 hour on the homework? 1. ____

2. How many students did the data include? 2. ____

3. How many students worked for exactly 3 hours on the homework? 3. ____

4. What is the longest period of time that any student(s) spent on the homework? 4. ____

For Exercises 5–6, use the tally chart below.

<table>
<thead>
<tr>
<th>Time Spent Exercising</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Hours per Week</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td>20 or more</td>
</tr>
</tbody>
</table>

5. The tally table shows how many hours a group of fourth-graders exercised in one week. How many fourth-graders were in the group? 5. ____

6. How many students exercised for exactly eight hours each week? 6. ____
For Exercises 7–8, use the set of data below.

Points Matt scored on tests:
98, 76, 85, 98, 94, 89, 98, 87, 91

7. What is the median? 7. ____
8. What is the mode? 8. ____

Use this set of data for items 9–11.

Miles jogged by Coreen:
4 mi, 11 mi, 5 mi, 5 mi, 2 mi, 2 mi,
3 mi, 2 mi, 1 mi, 2 mi, 5 mi

9. What is the mode? 9. ____
10. Which number is an outlier? 10. ____
11. What is the median of the data? 11. ____

For Exercises 12–14, use the bar graph below.

12. How many people said Hawaii was their favorite vacation spot? 12. ____
13. What place did the fewest number of people say was their favorite vacation spot? _____________
14. How many people picked either Texas or Arizona as their favorite vacation spot? 14. ____
Chapter Test, Form 2D

Read each question carefully. Write your answer on the line provided.

For Exercises 1–4, use the line plot below.

```
  1  2  3  4  5
X X X X X
X X X X X
X X X X X X
X X X X X X
```

Number of Hours of Homework

1. How many students worked for exactly 1 hour? __1__
2. How many students are there in the line plot altogether? __2__
3. How many students worked for exactly 3 hours? __3__
4. What is the most number of hours that any student(s) worked on homework? __4__

For Exercises 5–6, use the data below.

Robbie earned: $5, $7, $8, $11, $5, $7, $5

5. What is the median? __5__
6. What is the mode? __6__

For Exercises 7–8, use the tally chart below.

```
Time Spent Exercising
Number of
Hours per Week | Tally
4             | III
8             | HHH HHH HHH
12            | HHH HHH HHH HHH
16            | HHH HHH
20 or more    | I
```

7. This tally table shows how many hours fourth-graders exercised. How many fourth-graders were there altogether? __7__
8. How many students exercised for exactly 8 hours?  

For Exercises 9–10, use the data below.
Points Rosie scored on tests:
98, 76, 85, 98, 94, 89, 98, 87, 91

9. What is the median?  
10. What is the mode?

For Exercises 11–13, use the data below.
Miles walked by Christian:
4 mi, 10 mi, 5 mi, 5 mi, 2 mi, 3 mi, 2 mi, 1 mi, 2 mi

11. What is the mode?  
12. Which number is an outlier?  
13. What is the median?

For Exercises 14–16, use the bar graph below.

<table>
<thead>
<tr>
<th>Favorite Vacation Spots</th>
<th>Number of People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaii</td>
<td>12</td>
</tr>
<tr>
<td>Texas</td>
<td>6</td>
</tr>
<tr>
<td>California</td>
<td>18</td>
</tr>
<tr>
<td>Arizona</td>
<td>2</td>
</tr>
<tr>
<td>Florida</td>
<td>4</td>
</tr>
</tbody>
</table>

14. How many people said Hawaii was their favorite?  
15. The fewest number of people liked which place?  
16. Altogether, how many people picked either Texas or Arizona as their favorite?
Chapter Test, Form 3

Read each question carefully. Write your answer on the line provided.

For Exercises 1–4, use the line plot below.

![Line plot]

1. How many students worked for exactly 1 hour on the homework?  
2. How many students did the data set include altogether? 
3. How many students worked for either 2 hours or 3 hours on the homework? 
4. What is the longest period of time that any student(s) spent on the homework?

For Exercises 5–6, use the tally chart below.

![Tally chart]

5. The tally chart shows how many hours per week a group of fourth-graders exercised. How many fourth-graders were in the group? 
6. How many students exercised for exactly 12 hours per week?
For Exercises 7–8, use the set of data below.

Points Hunter scored on his math tests:
98, 76, 85, 98, 94, 89, 98, 87, 91

7. What is the median of this data set?
8. What is the mode of this data set?

Use this set of data for items 9–11.

Miles jogged by Alicia:
4 mi, 10 mi, 5 mi, 5 mi, 2 mi, 3 mi, 2 mi, 1 mi, 2 mi

9. What is the mode for this data set?
10. Which number is an outlier in the data set?
11. What is the median for this data set?

For Exercises 12–14, use the bar graph below.

12. Altogether, how many people were surveyed for this data set?
13. The fewest number of people chose which place as their favorite vacation spot?
14. How many people picked either Texas or Florida as their favorite vacation spot?
Demonstrate your knowledge by giving a clear, concise solution to each problem. Be sure to include all relevant drawings and justify your answers. You may show your solution in more than one way or investigate beyond the requirements of the problem. If necessary, record your answer on another piece of paper.

1. a. Define the terms mode, median, and outlier.

   b. Find the median, mode, and outlier (if any) of the following:
      Daily gas prices during the last week: $3.19, $2.79, $2.89, $2.99, $3.09, $2.79, $2.69

   c. Find the median, mode, and outlier (if any) of the following:
      Mosquito bites each day on vacation: 2, 1, 1, 2, 1, 2, 12, 1, 3

2. Use the following data to answer the questions.
   During the last meteor shower, Erika counted shooting stars for 5 days in a row: 7, 5, 3, 18, 3.

   a. Make a line plot of the data.

   b. What is the mode of the data?

   c. Does the data have an outlier?

   d. Do you think Erika will see more than 18 stars on the 6th day?

3. Choose the best way of plotting information—a tally chart, a bar graph, or a line graph—for the following data.

   a. Aurelia wants to see how many tacos were sold at her restaurant each day for a week.

   b. Ms. Chen surveys her students’ favorite music groups.

   c. Mr. Rodriguez wants to compare the scores of all the county high school soccer teams.
Student Recording Sheet

Use this recording sheet with pages 168–169 of the Student Edition. Read each question. Then fill in the correct answer.

1. A B C D

2. F G H J

3. A B C D

4. F G H J

5. A B C D

6. F G H J

7. A B C D

8. F G H J

9. A B C D

10. F G H J
Test Example

Estrella asked her class about their favorite vacation spots. She made a bar graph to show the results.

**Favorite Vacation Spots**

<table>
<thead>
<tr>
<th>Vacation Spots</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocean</td>
<td>12</td>
</tr>
<tr>
<td>Desert</td>
<td>8</td>
</tr>
<tr>
<td>Mountains</td>
<td>6</td>
</tr>
</tbody>
</table>

How many more students chose going to the ocean than the mountains?

- **A.** 5
- **B.** 3
- **C.** 2
- **D.** 1

**Read the Question**

Find the difference between going to the ocean and going to the mountains.

**Solve the Question**

Decide which operation and numbers to use.

Find $11 - 8$.

$11 - 8 = 3$

So, the answer is B.

**Choose the best answer.**

1. What is the median of this set of numbers?
   - {2, 4, 7, 3, 5, 5, 6}
   - **A.** 2
   - **B.** 4
   - **C.** 5
   - **D.** 7

2. What is the value of the digit 4 in 149,832,756?
   - **F.** 400,000
   - **G.** 4,000,000
   - **H.** 40,000,000
   - **J.** 400,000,000
For Exercises 3–5, use the tally chart.

<table>
<thead>
<tr>
<th>Lemonade Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Day</strong></td>
</tr>
<tr>
<td>Monday</td>
</tr>
<tr>
<td>Tuesday</td>
</tr>
<tr>
<td>Wednesday</td>
</tr>
<tr>
<td>Thursday</td>
</tr>
<tr>
<td>Friday</td>
</tr>
</tbody>
</table>

3. Karen sold lemonade after school. On which two days did she sell the least amount of lemonade?
   - A. Wednesday and Friday
   - B. Monday and Friday
   - C. Tuesday and Thursday
   - D. Thursday and Friday

3. ____

4. How much lemonade did Karen sell on Monday, Wednesday, and Friday?
   - F. 32
   - G. 20
   - H. 13
   - J. 12

4. ____

5. What is the median of the data?
   - A. 6
   - B. 5
   - C. 4
   - D. 3

5. ____
The table shows the number of visitors to the Planetarium.

<table>
<thead>
<tr>
<th>Planetarium</th>
<th>Month</th>
<th>Numbers of Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>September</td>
<td>4,459</td>
</tr>
<tr>
<td></td>
<td>October</td>
<td>3,763</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>7,284</td>
</tr>
<tr>
<td></td>
<td>December</td>
<td>5,375</td>
</tr>
</tbody>
</table>

6. How many visitors went to the Planetarium in October and December?
   - F. 9,138
   - G. 9,834
   - H. 11,047
   - J. 12,659
   6. __________

7. 8,584 – 3,442 =
   - A. 12,026
   - B. 10,312
   - C. 6,124
   - D. 5,142
   7. __________

8. What is 893,742 rounded to the nearest hundred?
   - F. 893,000
   - G. 893,700
   - H. 893,800
   - J. 894,000
   8. __________

9. Which number is represented by \( n \)? \( 862 - n = 256 \)
   - A. 606
   - B. 733
   - C. 1,118
   - D. 1,331
   9. __________

Name the best way of representing the data. Choose tally chart, frequency chart, line plot, bar graph, or line graph.

10. change in population from 1950–2005
    10. __________

11. average temperatures each month for a year
    11. __________

12. number of bird species spotted in the park
    12. __________
Answers

Chapter Resources

Fill in the missing information.

<table>
<thead>
<tr>
<th>Numbers</th>
<th>Mode</th>
<th>Median</th>
<th>Outliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 2, 5, 7, 9, 10, 85</td>
<td>2</td>
<td>7</td>
<td>85</td>
</tr>
<tr>
<td>15, 19, 19, 25, 28, 29, 78</td>
<td>19</td>
<td>25</td>
<td>78</td>
</tr>
<tr>
<td>1, 3, 4, 6, 9, 35</td>
<td>4</td>
<td>4</td>
<td>35</td>
</tr>
<tr>
<td>3, 10, 10, 30, 40, 50, 60</td>
<td>10</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>8, 21, 12, 8, 92, 8, 21</td>
<td>8</td>
<td>12</td>
<td>92</td>
</tr>
</tbody>
</table>

Anticipation Guide

Statistics: Data and Graphs

Before you begin Chapter 4

- Read each statement.
- Decide whether you agree (A) or disagree (D) with the statement.
- Write A or D in the first column OR if you are not sure whether you agree or disagree, write NS (not sure).

A, D, or NS Statement

<table>
<thead>
<tr>
<th>Statement</th>
<th>A or D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In a set of data, the median is the number that occurs most often.</td>
<td>D</td>
</tr>
<tr>
<td>2. In a set of data, the mode is the number in the middle when the numbers have been arranged from least to greatest.</td>
<td>D</td>
</tr>
<tr>
<td>3. A table can often help you to calculate an answer.</td>
<td>A</td>
</tr>
<tr>
<td>4. A line plot is a method to represent data using Xs above a number line.</td>
<td>A</td>
</tr>
<tr>
<td>5. A bar graph is helpful because it allows you to compare data.</td>
<td>A</td>
</tr>
<tr>
<td>6. A double bar graph displays three sets of related data.</td>
<td>D</td>
</tr>
<tr>
<td>7. You should never estimate when reading a bar graph.</td>
<td>D</td>
</tr>
<tr>
<td>8. A line graph can help you to make predictions about what will happen in the future.</td>
<td>A</td>
</tr>
<tr>
<td>9. You could use a line graph to plot the change in temperature during the year in your town.</td>
<td>A</td>
</tr>
<tr>
<td>10. Survey results can be represented on a number line.</td>
<td>A</td>
</tr>
</tbody>
</table>

After you complete Chapter 4

- Reread each statement and complete the last column by entering an A (agree) or a D (disagree).
- Did any of your opinions about the statements change from the first column?
- For those statements that you mark with a D, use a separate sheet of paper to explain why you disagree. Use examples, if possible.
Collect and Organize Data

Marcia counted the number of letters in each word in a story. The data is shown below:

<table>
<thead>
<tr>
<th>Number of Letters in Words in a Story</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 3 5 6 4 2 1 5 6 3 4 7 3 2 3 5 2 4</td>
</tr>
</tbody>
</table>

You can organize the data in a tally chart.

Example: For the first number, 3, make a tally mark in the table. Cross out the 3 in the data above. Then record and cross out the remaining 3s.

Complete the tally chart.

<table>
<thead>
<tr>
<th>Number of Letters in Words</th>
<th>Tally</th>
<th>Total Number of Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>II</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>III</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>IIII</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>III</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>IIII</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>III</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>I</td>
<td>1</td>
</tr>
</tbody>
</table>

Use the tally chart. How many words had:
1. 3 letters? 8
2. 2 letters? 4
3. 8 letters? 1
4. more than 3 letters? 16
5. less than 3 letters? 6

Skills Practice

Collect and Organize Data

Fernando took note of the types of pants worn by his classmates on a certain day. Below is his recording.

Type of pants: jeans, corduroys, khaki, jeans, athletic pants, jeans, jeans, jeans, corduroys, corduroys, slacks, corduroys, cargo pants, cargo pants, jeans, athletic pants

1. Make a tally chart and frequency table of Fernando’s data.

2. What is the most common type of pants worn in Fernando’s class? What is the least common?
   - Most common: jeans
   - Least common: slacks & athletic pants

3. Create a tally chart for the following:
   Types of pizza preferred by Coach Andretti’s soccer team:
   - pepperoni
   - sausage
   - extra cheese
   - ham & pineapple
   - pepperoni
   - ham & pineapple

<table>
<thead>
<tr>
<th>Types of Pizza Preferred by Coach Andretti’s Soccer Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of Pizza</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Pepperoni</td>
</tr>
<tr>
<td>Sausage</td>
</tr>
<tr>
<td>Extra Cheese</td>
</tr>
<tr>
<td>Ham &amp; Pineapple</td>
</tr>
<tr>
<td>Veggie</td>
</tr>
<tr>
<td>Cheese</td>
</tr>
</tbody>
</table>
Homework Practice

Collect and Organize Data

Organize the set of data in a tally chart.

1. While Ryan waited for his bus, he watched cars go by and recorded the color of the cars. Here is what he saw.

   Color of cars: red, white, blue, white, tan, red, tan, blue, red, tan, blue, white, tan, red, tan, white, tan, white, tan, blue, tan, blue, white, blue, tan

<table>
<thead>
<tr>
<th>Color of Cars</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>!!!</td>
</tr>
<tr>
<td>Tan</td>
<td>HHT</td>
</tr>
<tr>
<td>White</td>
<td>HHT</td>
</tr>
<tr>
<td>Blue</td>
<td>HHT</td>
</tr>
</tbody>
</table>

Organize the set of data in a frequency table.

2. Alyssa records what her friends say is their favorite day of the school week. Place this information in a frequency table.

<table>
<thead>
<tr>
<th>Day</th>
<th>Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>2</td>
</tr>
<tr>
<td>Tuesday</td>
<td>4</td>
</tr>
<tr>
<td>Wednesday</td>
<td>1</td>
</tr>
<tr>
<td>Thursday</td>
<td>6</td>
</tr>
<tr>
<td>Friday</td>
<td>9</td>
</tr>
</tbody>
</table>

Spiral Review

Find the missing number in each equation. (Lesson 3–6)

3. \(8 + 3 + 9 = 8 + \boxed{12}\)
4. \(4 + 16 = 8 + \boxed{4}\)
5. \(9 + 10 = 9 + \boxed{6}\)
6. \(16 + 8 = 7 + \boxed{9}\)
7. \(18 + 6 = 5 + \boxed{13}\)
8. \(19 + 5 = 11 + \boxed{8}\)

Problem-Solving Practice

Collect and Organize Data

Solve. Use a separate sheet of paper if necessary.

1. Make a tally chart for the number of students in the third-, fourth-, and fifth-grade classes: 26, 25, 27, 26, 28, 27.

   Check students’ charts.

   27 students

2. Use the data in your tally chart from Exercise 1. Which class size is most common?

   27 students

3. Make a tally chart and a frequency table for the number of books read by students during the summer: 4, 5, 7, 2, 4, 5, 6, 7, 8, 4, 5, 3.

   How many students took part in this survey?

   Check students’ charts and tables; 12 students

4. If another student is added to the survey and says she read 7 books, how would you change your tally chart and frequency table to show this?

   Add a tally next to the 7 and change 2 to 3 next to 7

5. Make a tally chart and a frequency table for the data showing amount of time it takes students to do their homework: 35 min., 1 hour, \(\frac{1}{2}\) hour, 45 min., 60 min., \(\frac{1}{2}\) hour. According to your frequency table, what is the longest time it takes the students to do their homework?

   Check students’ charts and tables; \(\frac{3}{2}\) hours, or 90 min

6. What is the difference between the greatest amount of time and the least amount of time spent doing homework?

   1 hour, or 60 min
In order to find out about their favorite foods, Oscar asked 10 of his classmates the following question: "What are your top three favorite snacks?" Look at his notes. Use them to organize the information in the chart below.

1. Pedro — cheese pizza, apples, vegetables and dip
2. Sara — yogurt, ice cream, pepperoni pizza
3. Jon — ice cream, bananas, popcorn
4. Theresa — pizza, vegetables and dip, chips
5. Abi — apples, pears, yogurt
6. Trevor — corn chips, pizza, vegetables and dip
7. Jair — apples, ice cream, pizza
8. Alison — pepperoni pizza, popcorn, chips
9. Bonita — pizza, apples, vegetables and dip
10. Dean — grapes, apples, cheese pizza

<table>
<thead>
<tr>
<th>Favorite Foods and Snacks</th>
<th>Tally Marks</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Pizza</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Vegetables and Dip</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Popcorn, Chips, etc.</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Ice Cream &amp; Yogurt</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Reteach**

Find Mode, Median, and Outliers

**Median, Mode, and Outliers**
You can analyze data using the median and mode. Use the table to help you find the outlier, median, and mode.

**Outlier:** an item of data that lies outside of the data.

**The outlier is 12**

**Median:** the middle number when the data is arranged in order from least to greatest

1, 3, 5, 5, 12

The median is 5.

**Mode:** the number that occurs most often

There are two 5s, so 5 is the mode.

Order the data from least to greatest. Then find the median, mode, and outlier.

1. Data: 6, 4, 3, 3, 0, 5, 18
   - List in order from least to greatest: 0, 3, 3, 4, 5, 6, 18
   - Median: 4
   - Mode: 3
   - Outlier: 18

2. Data: 83, 96, 91, 83, 78
   - List in order from least to greatest: 78, 83, 83, 91, 96
   - Median: 83
   - Mode: 83
   - Outlier: none

3. Data: 56, 88, 100, 30, 96, 56, 92
   - List in order from least to greatest: 30, 56, 56, 88, 92, 96, 100
   - Median: 88
   - Mode: 56
   - Outlier: 30
Skills Practice

Find the mode and median of the set of data. Identify any outliers.

1. Movie ticket prices

<table>
<thead>
<tr>
<th>Theaters</th>
<th>Plex</th>
<th>Multi</th>
<th>Cine</th>
<th>Matinee</th>
<th>Center</th>
<th>Theater</th>
<th>Main</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$8</td>
<td>$9</td>
<td>$9</td>
<td>$9</td>
<td>$8</td>
<td>$7</td>
<td>$6</td>
</tr>
</tbody>
</table>

Mode: $9       Median: $8       Outlier: none

2. Scores in basketball games

<table>
<thead>
<tr>
<th>Game</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>45</td>
<td>57</td>
<td>62</td>
<td>59</td>
<td>57</td>
<td>55</td>
<td>60</td>
</tr>
</tbody>
</table>

Mode: 57       Median: 57       Outlier: 45

Spiral Review

Organize the data in a tally chart and a frequency table. (Lesson 4–1)

3. Katherine watched students choose lunch from among four choices. Here is what she saw. Make a tally chart and frequency table of Katherine’s data.

**Lunch Choices:** pizza, salad, taco, pizza, sandwich, salad, taco, taco, pizza, taco, sandwich, taco, salad, pizza, taco, sandwich, salad, taco, pizza, taco, salad, pizza, sandwich, taco, pizza, salad, taco, pizza

<table>
<thead>
<tr>
<th>Lunch</th>
<th>Tally</th>
<th>Frequency Table:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pizza</td>
<td>🍕🍕🍕</td>
<td>pizza</td>
</tr>
<tr>
<td>Salad</td>
<td>🍗 🍗 🍗</td>
<td>salad</td>
</tr>
<tr>
<td>Taco</td>
<td>🍕 🍕 🍕</td>
<td>taco</td>
</tr>
<tr>
<td>Sandwich</td>
<td>🍩 🍩 🍩</td>
<td>sandwich</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lunch</th>
<th>Tally</th>
<th>Frequency Table:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pizza</td>
<td>🍕🍕🍕</td>
<td>pizza</td>
</tr>
<tr>
<td>Salad</td>
<td>🍗 🍗 🍗</td>
<td>salad</td>
</tr>
<tr>
<td>Taco</td>
<td>🍕 🍕 🍕</td>
<td>taco</td>
</tr>
<tr>
<td>Sandwich</td>
<td>🍩 🍩 🍩</td>
<td>sandwich</td>
</tr>
</tbody>
</table>

Find the mode and median of the set of data. Identify any outliers.

13. Pennies Found on the Sidewalk

<table>
<thead>
<tr>
<th>Day</th>
<th>Pennies Found</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

Mode: 8       Median: 8       Outlier(s): 1
Use data from the table to solve.

1. Find the median and the mode of the data.
   the median is 23 degrees; the mode is 26 degrees

2. What is the difference between the greatest temperature and the least temperature?
   the difference is 34 degrees

3. Which three states have the same normal temperature in January?
   Indiana, Missouri and Ohio

4. Are there any outliers in this data? Explain.
   9° in North Dakota and 12° in Minnesota are separated from most of the data.

5. Find the median and mode for the five states with the lowest temperature.
   median = 19°, no mode

6. Find the median and mode for the five states with the highest temperature.
   the median is 36°; the mode is 26°
**Problem-Solving Strategy**

Which type of fish has the greatest number of varieties listed in the chart?

<table>
<thead>
<tr>
<th>Varieties of Tetras, Goldfish, and Angelfish</th>
</tr>
</thead>
<tbody>
<tr>
<td>black neon tetra</td>
</tr>
<tr>
<td>black moor goldfish</td>
</tr>
<tr>
<td>gold angel</td>
</tr>
<tr>
<td>lemon tetra</td>
</tr>
<tr>
<td>fantail goldfish</td>
</tr>
<tr>
<td>white skirt tetra</td>
</tr>
<tr>
<td>silver dollar tetra</td>
</tr>
<tr>
<td>marble angel</td>
</tr>
<tr>
<td>lionhead goldfish</td>
</tr>
<tr>
<td>diamond tetra</td>
</tr>
<tr>
<td>silver angel</td>
</tr>
<tr>
<td>marble angel</td>
</tr>
<tr>
<td>lionhead goldfish</td>
</tr>
<tr>
<td>diamond tetra</td>
</tr>
<tr>
<td>silver angel</td>
</tr>
</tbody>
</table>

**Step 1. Understand**

Be sure you understand the problem.

Read carefully.

What do you know?
- There are different varieties of **tetras**, **goldfish**, and **angelfish**.

What do you need to find?
- You need to know how many different varieties of **tetras**, **goldfish**, and **angelfish** are listed.

**Step 2. Plan**

- Make a Table or List
- Write a Number Sentence
- Work Backward
- Act It Out
- Find a Pattern
- Make a Graph
- Guess and Check
- Use Logical Reasoning
- Solve a Simpler Problem
- Draw a Picture

**Make a plan.**

Choose a strategy.

A table can help you organize what you know.

Make a table to solve the problem.

**Step 2. Plan**

- Make a Table or List
- Write a Number Sentence
- Work Backward
- Act It Out
- Find a Pattern
- Make a Graph
- Guess and Check
- Use Logical Reasoning
- Solve a Simpler Problem
- Draw a Picture

**Make a plan.**

Choose a strategy.

A table can help you organize what you know.

Make a table to solve the problem.

<table>
<thead>
<tr>
<th>Type of Fish</th>
<th>Tally of Different Varieties</th>
<th>Total Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetras</td>
<td>HHHH</td>
<td>5</td>
</tr>
<tr>
<td>Goldfish</td>
<td>IIII</td>
<td>3</td>
</tr>
<tr>
<td>Angelfish</td>
<td>IIII</td>
<td>3</td>
</tr>
</tbody>
</table>

There are 5 different kinds of tetras.

There are 3 different kinds of goldfish.

There are 3 different kinds of angelfish.

There are more varieties of tetras than either of the other two kinds of fish.

**Step 4. Check**

Is the solution reasonable?

Reread the problem.

Does your answer match the data given in the problem?

**Answers may vary.**

**Practice**

1. Jack lists the fish in his aquarium. He has a fantail goldfish, a lionhead goldfish, a gold angel angelfish, a lemon tetra, and a black neon tetra. Of which type of fish does Jack have the least? **angelfish**
**Skills Practice**

**Problem-Solving Strategy**

Solve. Use the make a table strategy.

<table>
<thead>
<tr>
<th>Favorite Kind of Pet</th>
<th>Elliot—dog</th>
<th>Marion—cat</th>
<th>Tina—hamster</th>
<th>Paula—fish</th>
<th>Sam—cat</th>
<th>Howard—dog</th>
<th>Noriko—bird</th>
<th>Yolanda—dog</th>
<th>Barry—cat</th>
<th>Juan—dog</th>
<th>Jane—bird</th>
<th>Ten—cat</th>
<th>Sarah—cat</th>
<th>Traci—dog</th>
<th>Bruce—dog</th>
<th>Mike—cat</th>
<th>Rebecca—bird</th>
<th>Melanie—cat</th>
<th>Sylvia—cat</th>
</tr>
</thead>
</table>

1. Which pet got the most votes? **Cat**
2. Which pet got the fewest votes? **hamster**
3. Marla earns $5 for mowing a lawn. If she mows 5 lawns a week for 4 weeks, how much money will she earn? **$100**
4. Devin’s parents bought a computer for $1,800. If they pay $180 each month, how many months will it take them to pay for the computer? **10 months**
5. Shonda invites 15 of her friends over for yogurt. Nine of them want strawberry, five of them want vanilla. How many of Shonda’s friends want a flavor other than strawberry or vanilla? **1 friend**
6. Aaron is having a birthday party and he wants to make gift bags for his friends. If he invites 10 friends and includes 4 items in each bag, how many total items does he need? **40 items**
7. If James earns $6 per hour, how many hours per week does he work if he makes $360 every 2 weeks? **30 hours per week**
8. Write a problem where make a table would help you to solve it. **Answers may vary.**

---

**Homework Practice**

**Problem-Solving Strategy**

Solve. Use the **make a table** strategy.

1. Rosa knits sweaters to sell. Each sweater takes 4 balls of yarn. How many balls of yarn will she need to make 8 sweaters? **32 balls of yarn**
2. Each ball of yarn costs $6. How much money will Rosa earn selling all 8 sweaters if she sells each sweater for $35? Remember, she has to pay for the yarn she used to make the sweaters. **$88**
3. Josh is a photographer. For every 7 pictures he takes, he has one portrait he can sell for $15. If Josh made $180 selling portraits, how many photographs did he take? **84 photographs**
4. Hannah practices her gymnastics routine 12 times at each practice. If she practices 5 days a week, about how many times does Hannah practice her routine in 4 weeks? **240 times**

**Spiral Review**

Find the mode and median of the set of data. Identify any outliers. (Lesson 4-2)

5. Students absent because of the flu

<table>
<thead>
<tr>
<th>Month</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>25</td>
</tr>
<tr>
<td>October</td>
<td>125</td>
</tr>
<tr>
<td>November</td>
<td>125</td>
</tr>
<tr>
<td>December</td>
<td>175</td>
</tr>
<tr>
<td>January</td>
<td>175</td>
</tr>
<tr>
<td>February</td>
<td>225</td>
</tr>
<tr>
<td>March</td>
<td>175</td>
</tr>
</tbody>
</table>

Mode: **175**  Median: **175**  Outlier: **25**

6. Average travel time to school

<table>
<thead>
<tr>
<th>Student</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Javier</td>
<td>10</td>
</tr>
<tr>
<td>Daniel</td>
<td>15</td>
</tr>
<tr>
<td>Lourdes</td>
<td>10</td>
</tr>
<tr>
<td>Kayla</td>
<td>20</td>
</tr>
<tr>
<td>William</td>
<td>10</td>
</tr>
<tr>
<td>Amber</td>
<td>20</td>
</tr>
<tr>
<td>Kyle</td>
<td>40</td>
</tr>
</tbody>
</table>

Mode: **10**  Median: **15**  Outlier: **40**
Enrich

Counting Critters

Half of the critters in the backyard are spiders, and they all have eight legs. The rest are six-legged insects. If there are 56 critter legs in the backyard, how many critters are there?

8; 4 spiders and 4 insects

Complete this table and use it to solve the problem.

<table>
<thead>
<tr>
<th>Critters</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spider Legs</td>
<td>8</td>
<td>16</td>
<td>24</td>
<td>32</td>
<td>40</td>
</tr>
<tr>
<td>Insect Legs</td>
<td>6</td>
<td>12</td>
<td>18</td>
<td>24</td>
<td>30</td>
</tr>
</tbody>
</table>

Half of the animals in a backyard are dogs and they all have four legs. The rest are two-legged birds. If there are 24 animal legs in the backyard, how many animals are there?

8 (4 dogs, 4 birds)

Reteach

Line Plots

A line plot is another way to organize data. Line plots are a lot like tally charts. In line plots, you use Xs above a number line instead of tally marks next to a category. Line plots are used when you want to chart how often a certain number occurs in your data.

Students riding afterschool bus:

<table>
<thead>
<tr>
<th>Day</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>11</td>
</tr>
<tr>
<td>Tuesday</td>
<td>20</td>
</tr>
<tr>
<td>Wednesday</td>
<td>22</td>
</tr>
<tr>
<td>Thursday</td>
<td>20</td>
</tr>
<tr>
<td>Friday</td>
<td>21</td>
</tr>
</tbody>
</table>

Mode: 20
Median: 20
Outlier: 11

Organize the set of data in a line plot.

1. Number of students in each classroom:

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs. Connolly</td>
<td>27</td>
</tr>
<tr>
<td>Mr. Martinez</td>
<td>32</td>
</tr>
<tr>
<td>Mrs. Jones</td>
<td>29</td>
</tr>
<tr>
<td>Mr. Washington</td>
<td>30</td>
</tr>
<tr>
<td>Mrs. Gematti</td>
<td>31</td>
</tr>
<tr>
<td>Mrs. Norris</td>
<td>29</td>
</tr>
<tr>
<td>Mr. Calderone</td>
<td>29</td>
</tr>
<tr>
<td>Mrs. Abalon</td>
<td>31</td>
</tr>
<tr>
<td>Mr. Selfani</td>
<td>36</td>
</tr>
</tbody>
</table>

Identify the mode, median, and outliers for the data set.

2. Number of students in classroom.

Mode: 29 students
Median: 30 students
Outlier: 36 students
**Answers** (Lesson 4-4)

1. **Number of fans at the football game:**
   - Mode: 52,000 fans
   - Median: 50,000 fans
   - Outlier: 36,000 fans

2. **Points scored by the home team at each football game:**
   - Mode: 21 points
   - Median: 24 points
   - No outlier

---

**Skills Practice**

**Line Plots**

Organize each set of data in a line plot.

1. **Number of books checked out per person at the library:**
   - Mode: 2
   - Median: 3
   - Outlier: 10

2. **Number of home runs hit per game:**
   - Mode: 2
   - Median: 2
   - No outlier

---

**Homework Practice**

**Line Plots**

Organize each set of data in a line plot.

1. **Number of fans at the football game:**
   - Mode: 52,000 fans
   - Median: 50,000 fans
   - Outlier: 36,000 fans

2. **Points scored by the home team at each football game:**
   - Mode: 21 points
   - Median: 24 points
   - No outlier

---

**Spiral Review**

Solve. (Lesson 4-3)

5. **Aaron is selling popcorn to raise money for the band. He sells 1 box of popcorn for every 3 houses he visits. How many houses will he need to visit to sell 9 boxes of popcorn?**
   - 27 houses

6. **Kimberly babysits 3 hours on weekends. For every 3 hours she works, she earns $25. If she wants to earn $165, how many weekends must she work?**
   - 7 weekends

7. **If Kimberly starts working 5 hours on weekends and earns $42, how many weekends must she work to earn the $165?**
   - 4 weekends
Jennifer wants to know how hard her friends thought the extra credit math problem was. She asked them how many tries it took them to solve the problem. She made a chart of her information.

<table>
<thead>
<tr>
<th>Friends</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dylan</td>
<td>3</td>
</tr>
<tr>
<td>Allison</td>
<td>5</td>
</tr>
<tr>
<td>Jose</td>
<td>12</td>
</tr>
<tr>
<td>Olivia</td>
<td>4</td>
</tr>
<tr>
<td>Jesse</td>
<td>6</td>
</tr>
<tr>
<td>Chelsea</td>
<td>4</td>
</tr>
<tr>
<td>Logan</td>
<td>6</td>
</tr>
<tr>
<td>Maria</td>
<td>7</td>
</tr>
<tr>
<td>Trevor</td>
<td>4</td>
</tr>
</tbody>
</table>

1. Organize the data in a line plot.
2. How many times was the most common answer? 4 tries
3. What was the median number of tries? 5 tries
4. One friend's answer was very different from the other friends. How many tries did the one very different friend take? 12 tries
5. What is the difference between the greatest number of out-of-state plates seen by Enrico and the least number seen by James? 13 - 3 = 10
6. Who spotted the most out-of-state license plates? Enrico, 75; James, 71
7. What age was the most common age to learn to swim? 5 years
8. What ages had the same number of students learn to swim? 3, 6, and 7; and 2 and 10
9. What age was very different from all the other students' ages? 5 years

Enrico and James ride the bus to and from school. To pass the time, they had a contest to see how many out-of-state license plates each of them could spot each day. Here is the data they collected for two weeks.

<table>
<thead>
<tr>
<th>Out-of-State Plates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrico</td>
</tr>
<tr>
<td>James</td>
</tr>
<tr>
<td>3, 5, 6, 7, 8, 9, 10, 11, 12, 13</td>
</tr>
<tr>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</td>
</tr>
</tbody>
</table>

1. Use two different colors to make line plots for Enrico and James on the graphs below. Then answer the questions.

2. What is the difference between the greatest number of out-of-state plates seen by Enrico and the least number seen by James? 13 - 3 = 10
3. Who spotted the most out-of-state license plates? Enrico, 75; James, 71
4. What might explain James’ data for seeing 0 plates on one day? The zero seems to be an outlier. Sample answers might include: Maybe James was sick, or fell asleep on the bus that day. Maybe he lost his tally sheet.
5. What age was the most common age to learn to swim? 5 years
6. What ages had the same number of students learn to swim? 3, 6, and 7; and 2 and 10
7. What age was very different from all the other students' ages? 5 years

Hunter wants to know how old his classmates were when they learned how to swim. He took a survey and made a chart of his data:

<table>
<thead>
<tr>
<th>Out-of-State Plates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrico</td>
</tr>
<tr>
<td>James</td>
</tr>
<tr>
<td>3, 5, 6, 7, 8, 9, 10, 11, 12, 13</td>
</tr>
<tr>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</td>
</tr>
</tbody>
</table>

1. What is the difference between the greatest number of out-of-state plates seen by Enrico and the least number seen by James? 13 - 3 = 10
2. Who spotted the most out-of-state license plates? Enrico, 75; James, 71
3. What might explain James’ data for seeing 0 plates on one day? The zero seems to be an outlier. Sample answers might include: Maybe James was sick, or fell asleep on the bus that day. Maybe he lost his tally sheet.
4. What age was the most common age to learn to swim? 5 years
5. What ages had the same number of students learn to swim? 3, 6, and 7; and 2 and 10
6. What age was very different from all the other students' ages? 5 years
Name ___________________________ Date ________________  

**Reteach**  
**Bar and Double Bar Graphs**

You can use single bar graphs or double bar graphs to show data. A single bar graph presents one set of data. A double bar graph presents two sets of data.

When you create a double bar graph, you need to make a key to represent each set of data. Write a title and headings for the vertical and horizontal sides. Select a scale just as you would for a single bar graph. Remember to include different headings for both sets of data.

**Skills Practice**  
**Bar and Double Bar Graphs**

For Exercises 1–4, use the bar graph shown.

![Favorite Vacation Spots Bar Graph]

1. What is the favorite vacation spot? How many people chose it?  
   **Florida; 19 people**

2. Did more people choose France, Hawaii, or Greece as their favorite vacation spot?  
   **Hawaii**

3. How many more boys than girls chose Hawaii as their favorite vacation spot?  
   **2 boys**

4. Which vacation spot shows the greatest difference between boys and girls?  
   **Hawaii**

For Exercises 4–6, use the bar graph below.

1. What is the favorite sport? **Soccer**
2. What is the least favorite sport? **Rugby**
3. How many more people prefer soccer to football? **20**

For Exercises 4–6, use the bar graph below.

![Favorite Sports Bar Graph]

4. How many total students have voted for student body president? **240 students**
5. Which candidate is the winner of the election? **Shannon Peterson**
6. How many more votes did David need to win the election? **81 votes**
Answers (Lesson 4-5)

1. Which day had the most number of students using the gym? Friday

2. Did more girls or boys use the gym after school?
   - Number of boys: 6
   - Number of girls: 5

3. Examine how many boys used the gym.
   - Number of votes: 2
   - Number of votes: 3

   - Ada got 2 votes; Roger got 3 votes; 2 + 3 = 5 votes

5. How many votes did Josh get more than Roger? Explain how you know.
   - Josh got 6 votes; Roger got 3 votes; 6 - 3 = 3 votes

Organize the set of data in a line plot. (Lesson 4-4)

4-5

For Exercises 1–2, use the bar graph below.

This graph shows the number of students using the school gym after school.

<table>
<thead>
<tr>
<th>Day</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon.</td>
<td>10</td>
</tr>
<tr>
<td>Tue.</td>
<td>15</td>
</tr>
<tr>
<td>Wed.</td>
<td>20</td>
</tr>
<tr>
<td>Thu.</td>
<td>25</td>
</tr>
<tr>
<td>Fri.</td>
<td>20</td>
</tr>
</tbody>
</table>

1. Which day had the most number of students using the gym? Friday

2. Did more girls or boys use the gym after school?
   - Number of girls: 5
   - Number of boys: 6

3. Examine how many girls used the gym.
   - Number of votes: 2
   - Number of votes: 3

   - Ada got 2 votes; Roger got 3 votes; 2 + 3 = 5 votes

5. How many votes did Josh get more than Roger? Explain how you know.
   - Josh got 6 votes; Roger got 3 votes; 6 - 3 = 3 votes

For Exercises 3–4, use the bar graph below.

This graph shows the number of people wearing sneakers, boots, and regular shoes in the classroom. Fifteen students are wearing sneakers. Eight are wearing regular shoes, and six students are wearing boots.

<table>
<thead>
<tr>
<th>Student</th>
<th>Number of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Josh</td>
<td>6</td>
</tr>
<tr>
<td>Ada</td>
<td>2</td>
</tr>
<tr>
<td>Megan</td>
<td>4</td>
</tr>
<tr>
<td>Roger</td>
<td>3</td>
</tr>
<tr>
<td>Liam</td>
<td>1</td>
</tr>
</tbody>
</table>

4. How many votes did Josh get more than Roger? Explain how you know.
   - Josh got 6 votes; Roger got 3 votes; 6 - 3 = 3 votes

   - Ada got 2 votes; Roger got 3 votes; 2 + 3 = 5 votes

Use a separate sheet of paper to make a bar graph. Then solve.

3. Maurice made a bar graph to show the number of people wearing sneakers, boots, and regular shoes in his classroom. Fifteen students are wearing sneakers. Eight are wearing regular shoes, and six students are wearing boots. Make a bar graph to show the data. How many students are in Maurice's class?
   - Number of students = 15 + 8 + 6 = 29 students

4. Betina looked at Maurice's bar graph. She guessed that the number of students who are wearing regular shoes and boots is greater than the number of students wearing sneakers. Is Betina's guess correct? Explain.
   - The students wearing regular shoes and boots is 8 + 6 = 14; 14 < 15.
This graph shows the results of a reading contest at Jefferson Elementary School. Third and fourth graders kept track of the average number of books read by students for three months. Use the graph to complete the table below. **Sample answer given:**

<table>
<thead>
<tr>
<th>Title:</th>
<th>Result of a Book Reading Contest</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Month</strong></td>
<td><strong>Grade Level</strong></td>
</tr>
<tr>
<td>January</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>February</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>March</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

**Choose a Strategy**

There are many ways to solve most math problems. You will decide which strategy works best for you when you read the problems. Here are problem-solving strategies and tips on when to use them.

- **Draw a picture:** This strategy can help you look at the information in the problem a different way—useful when the problem is about distance or location.
- **Look for a pattern:** This strategy can help you solve problems when the input changes.
- **Make a table:** This strategy can help you solve problems that have a lot of information to organize.

Use this problem to learn more about choosing a strategy: Erin wants to buy bracelets for each of her friends. Each bracelet costs $3.50. If she has $25, how many bracelets can she buy?

**Understand**

You know that 1 bracelet costs $3.50. You know she has $25. You need to find out how many bracelets she can buy.

**Plan**

Choose a strategy. This problem has a lot of information that you must use to solve it. A table is a good way to organize information you have. Make a table to solve the problem.

**Solve**

<table>
<thead>
<tr>
<th>Bracelets</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Bracelets</td>
<td>$3.50</td>
<td>$7</td>
<td>$10.50</td>
<td>$14</td>
<td>$17.50</td>
<td>$21</td>
<td>$24.50</td>
<td>$28</td>
</tr>
</tbody>
</table>

You know how much 1 bracelet costs. You can fill in the chart to find out how many bracelets $25 can buy. Erin can buy 7 bracelets.
Check  Look back at the problem. Check to see if you are correct:
7 bracelets cost $24.50.
8 bracelets cost $28.00.
$28 is more than $25.
$25 is more than $24.50.
Your answer is correct.

Use any strategy shown below to solve. Tell what strategy you used.

1. Notebooks come with 50 pieces of paper. There are 32 students in class. If each student uses 5 pieces of paper, how many notebooks does the class need? 4 notebooks
   Strategy: sample answer: look for a pattern

2. Each batch of dough makes 6 rolls. If Sam wants to make 32 rolls, how many batches of dough will he need? 6 batches
   Strategy: sample answer: make a table

3. Gabrielle is decorating cubes for her room. If she puts four cubes together against a wall and wants a different color on each visible side, how many different colors will she need? 10 colors
   Strategy: sample answer: draw a picture

4. Laura is making a picnic. For every person coming to the picnic, she must have 2 sandwiches, 4 drinks, and 10 pretzels. If 4 people come to the picnic, how many food items will she need? 64 pieces of food
   Strategy: make a table

5. Admission to the skate park is $4 per child and $10 per adult. If Kristen's father brings Kristen and her friends to the skate park, how many friends can Kristen bring if they have $40 to spend? 6 friends
   Strategy: sample answer: make a table

6. Copy and complete the number pattern. 6, 9, 11, 14, 16, 19, 21, 24, 26
   Strategy: sample answer: look for a pattern
Use any strategy shown below to solve. Tell what strategy you used.

- Draw a picture
- Look for a pattern
- Make a table

1. Each night, Sabrina spends 15 minutes more doing homework than her sister Tiffany. If Tiffany spends 50 minutes in a 5-day week doing homework, how many minutes does Sabrina spend doing homework in that same week? **125 minutes**
   Sample answer: draw a picture

2. Caleb is organizing his shirts. He is following a pattern: white, blue, white, red, white, blue... What color is next if this pattern continues? **white**
   Sample answer: look for a pattern

3. Corey has 56 people to whom he would like to send a card. If the cards come in packages of 6, how many packages does he need to buy? **10 packages**
   Sample answer: make a table

### Spiral Review
For Exercises 4–6, use the graph shown.
(Lesson 4–5)

4. Which river is the longest? **Nile River**
5. About how long is the Yangtze River? **4,000 miles**
6. Estimate the difference in length between the Nile and the Amur Rivers. **1,200 – 1,700 miles**

### Enrich
A Presidential Problem

Find a list of all the presidents and use this table to tally the most common last initials among the presidents. Then use the data to make a bar graph of the top four most common initials.

<table>
<thead>
<tr>
<th>A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
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<tr>
<td>K</td>
<td></td>
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<tr>
<td>L</td>
<td></td>
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<tr>
<td>M</td>
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</tr>
<tr>
<td>N</td>
<td></td>
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<td>O</td>
<td></td>
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<tr>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td></td>
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<tr>
<td>S</td>
<td></td>
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<td>T</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td></td>
</tr>
</tbody>
</table>

Before 2009, what was the most common first letter for the last names of U.S. Presidents? **H**
Interpret Line Graphs

The table below shows the number of CDs sold last week. You can make a line graph to show the number of CDs sold each day.

<table>
<thead>
<tr>
<th>Day</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>15</td>
</tr>
<tr>
<td>Tuesday</td>
<td>10</td>
</tr>
<tr>
<td>Wednesday</td>
<td>30</td>
</tr>
<tr>
<td>Thursday</td>
<td>50</td>
</tr>
<tr>
<td>Friday</td>
<td>45</td>
</tr>
<tr>
<td>Saturday</td>
<td>70</td>
</tr>
<tr>
<td>Sunday</td>
<td>60</td>
</tr>
</tbody>
</table>

1. What day did Damien receive the lowest score on a quiz?
2. In what week did Damien receive the second highest score on a quiz?
3. In what week did Damien most improve his quiz score?
4. Michelle wants to see how much profit her lemonade stand has made between the months of May and September. She has made $5, $13, $12, $14, and $7 in May, June, July, August, and September, respectively.
5. How much of a gain did Michelle see from May to July?
6. In what month did Michelle see the sharpest drop in profit?
For Exercises 1–5, use the graph that shows the number of students completing their homework.

<table>
<thead>
<tr>
<th>Day</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
<td>29</td>
<td>7</td>
<td>25</td>
</tr>
</tbody>
</table>

1. On what day did the greatest number of students complete their homework? Thursday
2. How many students completed their homework on Tuesday? 29 students
3. On what day did the least number of students complete their homework? Wednesday
4. How many more students completed their homework on Monday than on Wednesday? 7 students
5. What is the total number of students completing their homework on Tuesday and Friday? 62 students

Accept reasonable answers for 2 and 4.

For Exercises 1–2, use the line graph.

<table>
<thead>
<tr>
<th>Date</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/6</td>
<td>10</td>
</tr>
<tr>
<td>1/13</td>
<td>20</td>
</tr>
<tr>
<td>1/20</td>
<td>15</td>
</tr>
<tr>
<td>1/27</td>
<td>25</td>
</tr>
<tr>
<td>2/3</td>
<td>30</td>
</tr>
<tr>
<td>2/10</td>
<td>10</td>
</tr>
</tbody>
</table>

1. Use the line graph to answer this question. What is the greatest number of students at Drama Club meetings? least? 25 students; 10 students
2. The first meeting on the line graph was the first Monday in January. Did attendance decrease or increase after the beginning of the year? Attendance increased

Use a separate sheet of paper to make a line graph. Then solve.

Make a line graph of the data. Title it, "Days Jon Practiced Piano."

<table>
<thead>
<tr>
<th>Month</th>
<th>Days Practiced</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>17</td>
</tr>
<tr>
<td>August</td>
<td>15</td>
</tr>
<tr>
<td>September</td>
<td>12</td>
</tr>
<tr>
<td>October</td>
<td>13</td>
</tr>
<tr>
<td>November</td>
<td>12</td>
</tr>
<tr>
<td>December</td>
<td>19</td>
</tr>
</tbody>
</table>

3. During which month did Jon practice the greatest number of days? December
4. During which two months did Jon practice the fewest number of days? September and November

Spiral Review

Use any strategy shown below to solve. Tell what strategy you used (Lesson 4–6).

- Look for a Pattern
- Draw a Picture
- Make a Table

6. Emma can borrow tables for her party. Each table can seat 6 guests. If she invites 45 people, how many tables will she need?

Sample answer: make a table

8 tables

7. The Pizza Palace sells 2 pizza slices for $3.00, 3 pizza slices for $4.50, and 4 pizza slices for $6.00. At this rate, what is the cost of 1 slice of pizza?

Sample answer: look for a pattern

$1.50
This graph shows the rise and fall of the temperature in Nashville, TN for one day. Use it to write questions for the answers given below.

1. The answer is 75°F.
   **For example, What was the high temperature at 4:00 P.M.?**

2. The answer is between midnight and 9 A.M.
   **For example, How long was the temperature at or below 60°F?**

3. The answer is about 62°F.
   **For example, What was the temperature at 10:00 A.M. and 10:00 P.M.?**

4. The answer is no.
   **For example, Did it get below 45° in Nashville?**

For Exercises 1–2, use the bar graph above.

1. In which month was the greatest number of videos rented? ____________

2. About how many more videos were rented in August than September? ____________

For Exercises 3–4, use the line graph above.

3. What was the temperature outside at 9:00 A.M.? ____________

4. How many degrees warmer was it at 12:00 than it was at 10:00? ____________
**Skills Practice**

**Analyze Graphs**

For Exercises 1–2, use the line graph.

1. Which day was warmest? **Thursday**
2. If the pattern continues, what will be the temperature on Monday? **70°F**

For Exercises 3–5, use the bar graph.

3. How many total votes are there? **35 votes**
4. How many more people prefer to read a book than do extra homework? **5 people**
5. What is the second most popular way to spend a rainy afternoon? **Watch a movie**

**Homework Practice**

**Analyze Graphs**

For Exercises 1–4, use the bar graph.

1. Which day did Ronaldo’s sell the most pizzas? **Saturday**
2. How many pizzas were sold on Thursday? **90 pizzas**
3. What was the total number of pizzas sold on Monday and Tuesday? **135 pizzas**
4. How many more pizzas were sold on Saturday than Wednesday? **35 pizzas**

For Exercises 5–8, use the graph. (Lesson 4–7).

5. Which hour had the greatest number of riders? **5:00**
6. How many people rode the bus at 3:00? **20 people**
7. Which two hours had a combined 125 riders? **7:00 and 5:00**
8. How many more people rode the bus at 7:00 than at 10:00? **45 people**
Problem-Solving Practice

Analyze Graphs

Determine the best graph to show the data.

1. You ask your friends about their favorite kinds of books. You want to show the data. Should you make a bar graph or a line plot?
   - **line plot**

2. Your family takes a vacation. You write down the number of miles you drive each day. Then, you want to make a graph that shows this data. Should you make a line graph or a line plot?
   - **line graph**

3. You want to make a graph of your math test scores. Choose the best type of graph for the data. Explain your choice.
   - **Bar graph, because bars are a good way to make a comparison.**

4. You want to make a graph that shows the number of times you have ridden your bicycle in the last six weeks. Choose the best type of graph for the data. Explain your choice.
   - **Line graph, because the line shows changes over time.**

5. Julio wants to make a graph that shows the profits from his paper route during the past year. Which type of graph should he make? Explain why.
   - **Line graph, because it will show how the profits have changed during the year.**

6. Kim wants to make a graph that shows the scores of her softball team’s games and the scores of the teams they have played this season. Which is the best type of graph to make for the data? Explain why.
   - **Double bar graph, because the bars will compare the scores of Kim’s team to the scores of the opposing teams.**

Sometimes the same data can be used to print very different pictures, depending on which type of graph is used. Study the graphs above, then answer the questions below.

1. Do both bar graphs show the same data? **Yes**

2. What is the main difference between the two graphs?
   - **Graph B displays three-month totals.**

3. Which graph do you think the salesperson showed her boss?
   - **The salesperson showed her boss Graph B because the number of cars sold appears to be higher, or because graph B shows a steady increase in sales.**
**Vocabulary Test**

Match each word to its definition. Write your answer on the line provided.

1. data **B**
   A. the number(s), that occurs most often in a set of numbers

2. double bar graph **E**
   B. another word for information

3. line graph **D**
   C. the middle number when a set of numbers is arranged from least to greatest

4. median **C**
   D. a graph that uses points connected by line segments to represent data

5. mode **A**
   E. a bar graph that compares two related groups of data

---

**Oral Assessment**

Place 7 pencils, 10 crayons, 4 erasers, 3 pieces of chalk, and 8 pieces of paper on the table. Create a chart to tally the amount of each object present.

Read each question aloud to the student. Then write the student’s answers on the lines below the question.

1. What does the chart indicate we have the most of?
   **Crayons**

2. What does the chart indicate we have the least of?
   **chalk**

3. If you took away 3 crayons, what item would we have the most of?
   **pieces of paper**

4. Tell how you got your answer:
   **Looking at the chart, if you take away 3 tallies for crayons, the pieces of paper row has the most tallies.**

5. How many pieces of chalk would you have to add to make that the item we have the most of?
   **You would need to add 8 pieces of chalk so you had a total fo 11 pieces of chalk.**

6. Explain your answer.
   **3 + 8 = 11 pieces of chalk**
7. Chen asked his friends how much money they receive for an allowance. The responses were: $10, $8, $10, $10, $0, $5, $0, $20, $10. How many friends did Chen survey?

9 friends

8. What is the median of the responses?

$10

9. Prove your answer.

When the responses are placed in order from greatest to least, $10 is the middle response.

10. What is the mode of the responses?

$10

11. Tell how you got your answer.

10 occurred most often so it is the mode.

12. If 3 students changed their response from red to blue, would the median be the same? If not, what would it be?

The median would stay the same.

13. Explain your answer.

Pink is still the middle response.
Chapter 4 Assessment Answer Key

Diagnostic Assessment
Page 49

1. 11, 13, 14, 15, 18
2. 25, 38, 49, 55, 64
3. 16, 21, 31, 34, 52
4. 28, 47, 54, 76, 87
5. 55
6. 68
7. 53
8. 46
9. 71
10. 59

Chapter pretest
Page 50

1. mode = 99; median = 87; outlier = 2
2. mode = 2; median = 5; outlier = none
3. $6.00
4. 32 shots

Quiz 1
Page 51

1. 1. Adults Height Category
<table>
<thead>
<tr>
<th>Height</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'8&quot;–5'0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>5'1&quot;–5'5&quot;</td>
<td>8</td>
</tr>
<tr>
<td>5'6&quot;–5'10&quot;</td>
<td>12</td>
</tr>
<tr>
<td>5'11&quot;–6'3&quot;</td>
<td>5</td>
</tr>
</tbody>
</table>
2. 5’ 6”–5’ 10”
3. 3
4. 40,000
5. 40,000
6. 140,000

11. September
12. 150

(continued on the next page)
Chapter 4 Assessment Answer Key

Quiz 2
Page 52

1. 9 families
2. 2, 2
3. none
4. May
5. Los Angeles
6. accept answers between 10ºF–15ºF
7. 4 CDs

Quiz 3
Page 53

1. spring
2. 15 birthdays
3. 8 birthdays
4. Monday
5. 20 dogs
6. 10 dogs

Mid-Chapter Review
Page 54

1. | Hair     | Tally |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>1111</td>
</tr>
<tr>
<td>Brown</td>
<td>11111</td>
</tr>
<tr>
<td>Red</td>
<td>11</td>
</tr>
<tr>
<td>Blonde</td>
<td>1111</td>
</tr>
</tbody>
</table>

2. brown
3. 5
4. 7
5. 35 people
   34 people
   18 people
Chapter 4 Assessment Answer Key

Form 1
Page 60

1.  D
2.  J
3.  A
4.  J
5.  B
6.  J

(continued on the next page)

Form 2A
Page 61

1.  C
2.  H
3.  A
4.  G
5.  B
6.  F

(continued on the next page)
Chapter 4 Assessment Answer Key

Form 2A (continued)
Page 63

7. C
8. J
9. D

10. H
11. A

Form 2B
Page 64

1. B
2. G
3. A
4. F
5. B
6. F

7. B
8. H
9. C

10. H
11. A
Chapter 4 Assessment Answer Key

Form 2C
Page 66

1. 8
2. 30
3. 7
4. 5
5. 35
6. 10
7. 91
8. 98

Form 2D
Page 67

1. 4
2. 18
3. 2
4. 5
5. 7
6. 5
7. 35
8. 98

12. 12

13. Arizona
14. 8

(continued on the next page)
### Chapter 4 Assessment Answer Key

<table>
<thead>
<tr>
<th>Form 2D (continued)</th>
<th>Form 3</th>
<th>Page 69</th>
<th>Page 70</th>
<th>Page 71</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.  <strong>10</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. <strong>91</strong></td>
<td>7.  <strong>91</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. <strong>98</strong></td>
<td>8.  <strong>98</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. <strong>2</strong></td>
<td>9.  <strong>2</strong></td>
<td></td>
<td></td>
<td></td>
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<td>12. <strong>10</strong></td>
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<td></td>
<td></td>
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<tr>
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<td>14. <strong>12</strong></td>
<td>12. <strong>44</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Arizona</strong></td>
<td></td>
<td>13. <strong>Arizona</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. <strong>8</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. **4**
2. **18**
3. **9**
4. **5**
## Chapter 4 Assessment Answer Key

**Page 72, Extended-Response Test  
Scoring Rubric**

<table>
<thead>
<tr>
<th>Level</th>
<th>Specific Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>The student demonstrates a <strong>thorough understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student has responded correctly to the task, used mathematically sound procedures, and provided clear and complete explanations and interpretations. The response may contain minor flaws that do not detract from the demonstration of a thorough understanding.</td>
</tr>
<tr>
<td>3</td>
<td>The student demonstrates an <strong>understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student’s response to the task is essentially correct with the mathematical procedures used and the explanations and interpretations provided demonstrating an essential but less than thorough understanding. The response may contain minor errors that reflect inattentive execution of the mathematical procedures or indications of some misunderstanding of the underlying mathematics concepts and/or procedures.</td>
</tr>
<tr>
<td>2</td>
<td>The student has demonstrated only a <strong>partial understanding</strong> of the mathematics concepts and/or procedures embodied in the task. Although the student may have used the correct approach to obtaining a solution or may have provided a correct solution, the student’s work lacks an essential understanding of the underlying mathematical concepts. The response contains errors related to misunderstanding important aspects of the task, misuse of mathematical procedures, or faulty interpretations of results.</td>
</tr>
<tr>
<td>1</td>
<td>The student has demonstrated a <strong>very limited understanding</strong> of the mathematics concepts and/or procedures embodied in the task. The student’s response to the task is incomplete and exhibits many flaws. Although the student has addressed some of the conditions of the task, the student reached an inadequate conclusion and/or provided reasoning that was faulty or incomplete. The response exhibits many errors or may be incomplete.</td>
</tr>
<tr>
<td>0</td>
<td>The student has provided a <strong>completely incorrect</strong> solution or uninterpretable response, or no response at all.</td>
</tr>
</tbody>
</table>
In addition to the scoring rubric found on page A30, the following sample answers may be used as guidance in evaluating open-ended assessment items.

1. a. The mode of a set of data is the number that occurs most often. The median is the number in the middle when the numbers have been arranged from least to greatest. An outlier is an item of data that lies outside of the data.
   
b. median = $2.89; mode = $2.79
   
c. median = 2; mode = 1; outlier = 12

2. a. Counting Shooting Stars
   
   ![Graph]
   
b. 3
   
c. Yes. The outlier is 18.
   
d. Probably not because 18 is an outlier, therefore, not a frequent occurrence in the data.

3. a. A line graph, because it shows how data changes over time.
   
b. a tally chart
   
c. a bar graph
Chapter 4 Assessment Answer Key

1. C
2. H
3. C
4. G
5. B
6. F
7. D
8. G
9. A
10. line graph
11. bar graph
12. frequency table