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*Use Place Value to Round Decimals***Unit 7**
Standard 5.NBT.A.4**Unit 7 Standards**
(Student pages 43–48)**Common Core Standards for Mathematics:** 5.NBT.A.4

Domain	Number and Operations in Base Ten
Cluster	Understand the place value system.
Standard	5.NBT.A.4 Use place value understanding to round decimals to any place.

Other Standards Addressed in this Unit

5.NBT.A.1, 5.NBT.A.3, 4.NBT.A.3, 3.NBT.A.1

Standards for Mathematical Practice Addressed in this Unit

MP.1	Make sense of problems and persevere in solving them.
MP.2	Reason abstractly and quantitatively.
MP.4	Model with mathematics.
MP.6	Attend to precision.
MP.7	Look for and make use of structure.

Unpacking the Standards

In grade 3, students used place value to round whole numbers to the nearest 10 or 100. In grade 4, students rounded multi-digit whole numbers less than 1,000,000 to any place. In grade 5, students round decimal numbers (to the thousandths) to any place. Rounding should not be limited to using an algorithm. Students should be given opportunities to build number sense understanding of place value by using number lines and benchmark numbers as well.

Unit 7

Standard 5.NBT.A.4

Use Place Value to Round Decimals

Getting Started

Introduction Activity

Students work in groups of 3–5 to brainstorm examples of instances in which it is important to use an exact decimal number and instances in which it is appropriate to use an approximate number. Each group records the information in a T-chart. Groups share results and compile a class chart of examples.

(DOK 2, Bloom’s Level: Synthesis/Create)

Suggested Formative Assessment

In a personal math journal, each student writes a one-minute essay to respond to the question “Why do I need to know how to round decimal numbers?” The teacher gives students exactly one minute to respond to the prompt, reminding them to think beyond grades and address why they really need this skill. The teacher reviews student essays in order to plan further instruction.

(DOK 2, Bloom’s Level: Comprehension/Understand)

Children’s Literature Connections

Great Estimations – Bruce Goldstone

Greater Estimations – Bruce Goldstone

Weighing the Elephant – Ting-xing Ye

Betcha!: Estimating – Stuart J. Murphy

Vocabulary Focus

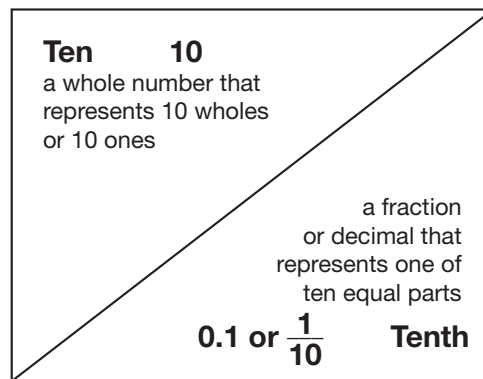
The following are essential vocabulary terms for this unit.

approximate	digit	place value	thousandth
decimal number	estimate	round	
decimal point	hundredth	tenth	

Vocabulary Activity

Diagonal Definitions

The teacher provides each student with a sheet of unlined paper. Students divide the paper by drawing a diagonal line as shown. Students write “ten” on the top half and “tenth” on the bottom half. Students use words, pictures, and numbers to show the meanings of the two words. Students share and display their posters.



This activity may be varied using the terms “hundred/hundredth” or “thousand/thousandth.”
(DOK 2, Bloom’s Level: Application/Apply)

Suggested Formative Vocabulary Assessment

Students use a weather check strategy to communicate to the teacher how well they comprehend the meanings of the vocabulary terms used in the activity. On a sheet of paper or a personal dry erase board, each student draws and then displays one of the following images.

Sun – indicates a clear understanding with no need for further explanation

Some clouds – indicates some understanding with some need for further explanation

Many clouds – indicates a very cloudy understanding with much need for further explanation

The teacher observes the results of the weather check in order to plan additional instruction.

Suggested Instructional Activities

1. Students work in pairs. The teacher creates a series of number riddles, written on large index cards or sentence strips. Students determine the mystery numbers. For example:
 - When rounded to the tenths place, I am 19.2. What numbers could I be?
 - When rounded to the hundredths place, I am 345.60. What numbers could I be?
 - When rounded to the tens place, I am 120. What numbers could I be?

Each pair shares their answers with the class.

(DOK 2, Bloom’s Level: Analysis/Analyze)

Unit 7

Standard 5.NBT.A.4

Use Place Value to Round Decimals

2. Each student writes a number with five digits, to the thousandths or hundredths place, as assigned. Then each student writes three clues about the number. For example, a student may select 83.792.
 - *Clue 1: The number is between 83 and 84 on the number line.*
 - *Clue 2: When rounded to the nearest hundredth, the number has a 9 in the hundredths place.*
 - *Clue 3: When rounded to the nearest tenth, the number has an 8 in the tenths place.*

Students work in pairs and read the three clues to a partner. The partner has three opportunities to guess the number. Then students switch roles. After everyone has an opportunity to guess their partner's number, students share strategies used to determine the correct number.

(DOK 2, Bloom's Level: Analysis/Analyze)

3. Students work in groups to create a chant or cheer to remember the rules of rounding. Then students make a poster with example problems they can work and answer using the chant. Students perform their chants/cheers for the class and explain their posters. Each person in the group selects an example problem on the poster to explain/discuss with the class.

(DOK 2, Bloom's Level: Synthesis/Create)

Suggested Formative Assessment

The class creates a flowchart or other graphic organizer to show a procedure for rounding decimal numbers to a given place. The teacher places students in teams and seats them in rows (one behind the other). Each student needs a dry erase board, marker, and eraser. The teacher displays a decimal number, and all students record the number on their boards. Next the teacher directs students to round the number to a particular place. Each student records the rounded answer on his/her dry erase board. At the teacher's signal, the students hold up their boards to show their answers. Students showing the correct answer earn a point for their team. The teacher selects one student to explain how to find the rounded number. If the student explains the procedure correctly, he/she earns five bonus points for the team.

(DOK 2, Bloom's Level: Application/Apply)

Suggested Reflection/Closure Activity

Students work in teams of three. The teacher displays a decimal number to thousandths. Student 1 rounds the number to the nearest whole number, student 2 rounds to the nearest tenth, and student 3 rounds to the nearest hundredth. The class discusses responses, and teams receive one point for each correct response. The class repeats the activity with other decimal numbers, and the teacher provides a prize or privilege for the team with the most points.

(DOK 1, Bloom's Level: Application/Apply)

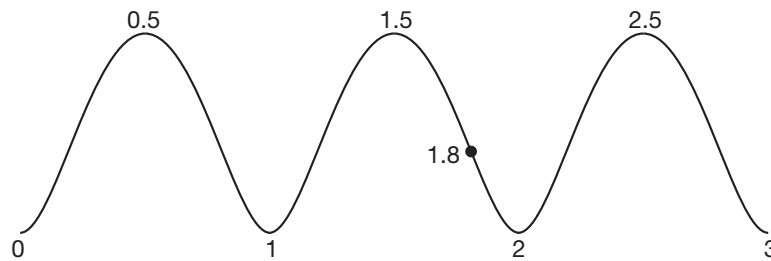
Suggested Formative Assessment

Students complete the Motivation Station activity "Secret Code Wheel" on page 48 in the student edition. Students compare work and share the secret message. The teacher reviews student responses and adjusts instruction and/or provides interventions as needed.

(DOK 2, Bloom's Level: Application/Apply)

Interventions

- Students use a roller coaster number line model to round decimal numbers. The class discusses the boundary numbers used to label the bottom of each hill and the halfway point numbers at the top of each hill. An example is shown with rounding to the nearest whole number. The number 1.8 is located between the boundary numbers 1 and 2. Since 1.8 is greater than 1.5, it is located past 1.5 on the downhill slope. Students discuss which way the roller coaster would coast to reach the nearest whole number. The number 1.8 would coast down to 2, so 1.8 rounds to 2. The class discusses what should happen at a halfway point such as 0.5 or 1.5. The class repeats this process with a roller coaster number line labeled with boundary numbers representing tenths and rounding to the nearest tenth.



(DOK 1, Bloom's Level: Comprehension/Understand)

- Students use sticky notes to help with place value and rounding. Each place value digit is written on a different color of sticky note. For example:
 - Yellow for the ones place and the decimal
 - Bright pink for tens place and light pink for tenths place
 - Bright blue for hundreds place and light blue for hundredths place

Students lay out blank sticky notes in the correct color order for place value as defined above. The teacher allows time to review the procedure for rounding and assigns a digit to each place (e.g., put a 5 in the tens place, put a 9 in the hundredths place). The teacher then asks students to round the number to a particular place value.

(DOK 1, Bloom's Level: Application/Apply)

- Students use real or play money as models of decimal place value and rounding. When rounding to the nearest dollar, students find the boundary amounts and the middle point. For example, when rounding \$3.86 to the nearest dollar, the boundaries are \$3 and \$4 because \$3.86 is between these two dollar amounts. The middle point is \$3.50. Since \$3.86 is greater than \$3.50, it will round to \$4.

Students work in pairs and play a rounding race. The teacher provides a deck of cards containing money amounts. The cards are placed facedown on the table between the two players. The top card is turned over. The first student to round the amount to the nearest dollar is the winner of the round and receives the card. Play proceeds until the teacher calls time. The student who collects more cards is the winner of the game.

(DOK 2, Bloom's Level: Application/Apply)

Unit 7

Standard 5.NBT.A.4

Use Place Value to Round Decimals

Suggested Formative Assessment

Using a deck of cards with face cards and aces removed, students create their own numbers to round. Students draw a decimal point on a sticky note. The students turn over three cards to position left of the decimal point and three cards to position right of the decimal point. Students read the decimal number. Then the teacher provides five place value cards (hundreds, tens, ones, tenths, hundredths). The student draws one card to determine the place value for rounding the number. Students repeat the activity. As students participate, the teacher has a one-on-one conversation with each student in the intervention group to determine his/her level of understanding and plans additional interventions as needed.

(DOK 1, Bloom's Level: Application/Apply)

Extending Student Thinking

Haiku is a type of poetry from the Japanese culture. A haiku poem is short and deals with everyday subjects such as nature or experiences. Haiku does not rhyme and should paint a mental picture. The most common form for haiku is three lines with the following pattern of syllables:

Line 1: 5 syllables

Line 2: 7 syllables

Line 3: 5 syllables

Example of a math haiku:

A cone in real life,
Clown hat, traffic cone, ice cream—
Round base with a point.

Students select three words from the vocabulary list for this unit and write a haiku for each word with each poem on a separate sheet of paper. Students illustrate the page for each poem. Poems are shared with the class and organized into a class book of poems.

(DOK 3, Bloom's Level: Synthesis/Create)

Skillful Thinking

Skillful Thinking = Deeper Learning through Revised Bloom's Taxonomy, Depth of Knowledge, and 9 Traits of Critical Thinking

The *9 Traits of Critical Thinking™* include *adapt, collaborate, communicate, create, examine, inquire, link, reflect, and strive*. These traits foster high-quality thinkers. On the Skillful Thinking page in each unit of the student edition, traits are selected and identified in each questioning prompt to reinforce student use of the traits in the context of mathematics. The labeling of the traits assists students in recognizing that the application of a focus trait is needed to complete the questioning prompt. The educator should note that each questioning prompt in the student edition is not limited to the identified trait since multiple critical thinking traits may be utilized by the student to successfully respond to the prompt.



Link - I apply knowledge to reach new understandings.

- ✓ Engagement Indicator - Students successfully apply new knowledge to complex situations in everyday life.
- ✓ Strategy to Facilitate the **Link** Trait - Present new tasks in which students refer to past learning to demonstrate application of prior experiences.



Examine - I use a variety of methods to explore and to analyze.

- ✓ Engagement Indicator - Students use analytical skills to make inferences, interpret data, integrate or organize ideas, and make connections.
- ✓ Strategy to Facilitate the **Examine** Trait - Challenge students to organize information to deepen insight by discovering patterns, trends, and connections to form conclusions.

Unit 7

Standard 5.NBT.A.4

Use Place Value to Round Decimals

Answer Key and Codings

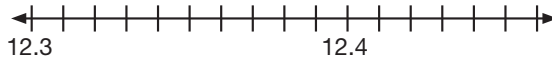
Page	Question	Answer	DOK Level	Bloom's Original/Revised																																																				
47	1	Explanations will vary. 0.045; 0.054	2	Application/Apply																																																				
	2	Students could name any of the following decimals: 17.50, 17.51, 17.52, 17.53, 17.54.	2	Analysis/Analyze																																																				
	Journal	Explanations will vary.	2	Comprehension/Understand																																																				
48	Motivation Station	<table border="1"> <tbody> <tr><td>A</td><td>300</td><td>N</td><td>43.3</td></tr> <tr><td>B</td><td>79</td><td>O</td><td>690</td></tr> <tr><td>C</td><td>3.35</td><td>P</td><td>4000</td></tr> <tr><td>D</td><td>15.7</td><td>Q</td><td>15.3</td></tr> <tr><td>E</td><td>1000</td><td>R</td><td>2000</td></tr> <tr><td>F</td><td>390</td><td>S</td><td>100</td></tr> <tr><td>G</td><td>91</td><td>T</td><td>910</td></tr> <tr><td>H</td><td>98.3</td><td>U</td><td>600</td></tr> <tr><td>I</td><td>800</td><td>V</td><td>370</td></tr> <tr><td>J</td><td>35.9</td><td>W</td><td>1.45</td></tr> <tr><td>K</td><td>3.92</td><td>X</td><td>287</td></tr> <tr><td>L</td><td>196</td><td>Y</td><td>11.1</td></tr> <tr><td>M</td><td>40</td><td>Z</td><td>90</td></tr> </tbody> </table> <p>Great job!</p>	A	300	N	43.3	B	79	O	690	C	3.35	P	4000	D	15.7	Q	15.3	E	1000	R	2000	F	390	S	100	G	91	T	910	H	98.3	U	600	I	800	V	370	J	35.9	W	1.45	K	3.92	X	287	L	196	Y	11.1	M	40	Z	90	2	Application/Apply
A	300	N	43.3																																																					
B	79	O	690																																																					
C	3.35	P	4000																																																					
D	15.7	Q	15.3																																																					
E	1000	R	2000																																																					
F	390	S	100																																																					
G	91	T	910																																																					
H	98.3	U	600																																																					
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J	35.9	W	1.45																																																					
K	3.92	X	287																																																					
L	196	Y	11.1																																																					
M	40	Z	90																																																					

Name _____

Standard 5.NBT.A.4

Unit 7 Introduction

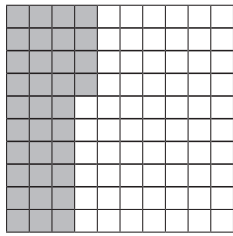
1. Place a dot on the approximate location of 12.369 on the number line.



What is 12.369 rounded to the nearest tenth?

Answer: _____

2. The large square represents one whole. Cecily shaded the square to represent a decimal number.



What is the value of Cecily's number rounded to the nearest tenth?

Answer: _____

3. Omar ran the 40-yard dash in 9.846 seconds. What is Omar's time rounded to the nearest hundredth of a second?

Answer: _____

4. Jeremiah rounded a number to 8.7. What could the original number have been?

Answer: _____

5. Violet looked through a catalog and found a dress she wanted to order. She used a calculator to determine that the total cost of the dress, tax, and shipping was \$129.207. What is the total rounded to the nearest penny?

Answer: _____

Explain how you found your answer.

6. Smith City received 2.45 inches of rain on Monday and 1.72 inches of rain on Tuesday. Write an equation showing a way to estimate, to the nearest inch, the total rainfall for the two days.

Answer: _____

Words for the Wise

approximate	digit	place value	thousandth
decimal number	estimate	round	
decimal point	hundredth	tenth	

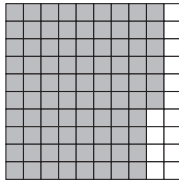


Name _____

Unit 7 Partner Practice

Standard 5.NBT.A.4

1. The large square represents one whole. Haley shades a decimal number in the square as shown.

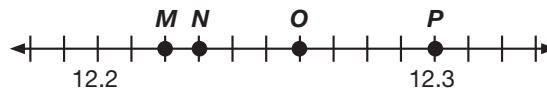


Which shows the value of Haley's number rounded to the nearest whole number?

- A 0 C 1
- B 0.5 D 1.5
2. Arnold wants to save enough money to purchase a new video game, including sales tax. Arnold uses a calculator and finds that he needs a total of \$56.987. Which shows this amount rounded to the nearest cent?
- A \$57.00 C \$56.98
- B \$56.99 D \$56.90
3. A weather station's location was rounded to 0.11 kilometer above sea level. Select **all** of the following answers that could represent the actual location, in kilometers above sea level, of the weather station.
- A 0.117 km
- B 0.105 km
- C 0.114 km
- D 0.102 km
- E 0.101 km
- F 0.109 km
4. A carpet beetle is 0.063 inch in length, and a powder post beetle is 0.25 inch in length. Which expression shows a way to estimate the difference in the lengths of the two beetles? Estimate to the nearest tenth of an inch.
- A $0.063 - 0.25$
- B $0.25 - 0.06$
- C $0.2 - 0.1$
- D $0.3 - 0.1$
5. Xavier weighs 44.455 kilograms. Which shows his weight, in kilograms, rounded to the nearest hundredth and the nearest tenth?
- A 44.40, 44.4 C 44.46, 44.5
- B 44.45, 44.5 D 44.50, 44.5
6. Liang runs cross-country track. His best times for his last three meets are shown in the table.

Date	Time
June 5	12.10 min
June 12	12.224 min
June 17	11.501 min

Which point on the number line shows Liang's time on June 12, rounded to the nearest hundredth of a minute?



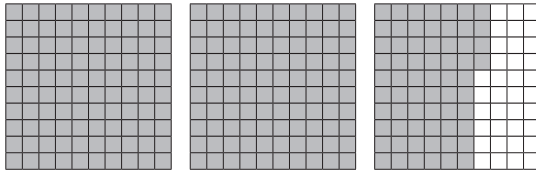
- A M C O
- B N D P

Name _____

Standard 5.NBT.A.4

Unit 7 Independent Practice

1. Cassandra represents a decimal number with these decimal squares.



Which shows Cassandra's number rounded to the nearest tenth?

- A 2.0
B 2.6
C 2.64
D 2.7
2. Destiny paid \$1.59 for a new school box. What is the price of the school box rounded to the nearest dollar?
A \$1.00
B \$1.50
C \$1.60
D \$2.00
3. Carlos helps his mom bake bread. He weighs flour on a digital kitchen scale. The weight of the flour is 13.23 ounces. What is 13.23 rounded to the nearest whole number?
A 12
B 13
C 13.2
D 14
4. Shawn uses a calculator to solve a division computation. The calculator shows the quotient to be 13.473. Which shows the quotient rounded to the nearest tenth and the nearest hundredth?
A 13.0, 13.50
B 13.40, 13.46
C 13.5, 13.47
D 13.57, 13.48
5. Monica uses the digits 5, 6, and 7 to create a number. Her number rounds to 6.6. Which of the following numbers could be Monica's number?
A 7.65
B 6.75
C 6.57
D 5.67
6. The chart shows the scores of the top five female gymnasts in a gymnastics meet.

Gymnastics Scores

Name	Score
Sarah	9.63
Angela	9.66
Judy	9.54
Tameka	9.57
Elsa	9.75

Select **two** gymnasts who have the same score when the scores are rounded to the nearest tenth.

- A Sarah
B Angela
C Judy
D Tameka
E Elsa

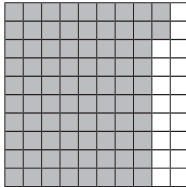


Unit 7 Assessment

Name _____

Standard 5.NBT.A.4

1. The large square represents one whole. Tremaine shades a decimal number in the square as shown.



Which shows Tremaine's number rounded to the nearest tenth?

- A 0.8 C 0.9
B 0.85 D 1.0
2. Emsley is 12.53 miles from her house. Which shows the value of 12.53 rounded to the nearest tenth and the nearest whole number?
- A 12.0, 13.0 C 12.53, 12
B 12.5, 13 D 12.6, 10

3. Ms. Jones used 591 kilowatt hours of electricity in May. The cost for electricity is \$0.091 per kilowatt hour. Her total cost is \$53.781, but her bill is rounded to the nearest cent. How much is Ms. Jones' electric bill?

- A \$54.00 C \$53.78
B \$53.80 D \$53.70

4. Natalie's parents are planning a trip. They created this chart showing the average gasoline prices in the nation.

Gasoline Prices			
	Regular	Mid-Grade	Premium
Average Price	\$3.387	\$3.529	\$3.663

Which shows the price of mid-grade gasoline rounded to the nearest hundredth?

- A \$3.50 C \$3.53
B \$3.52 D \$3.60

5. Stacey creates this table to show season field goal percentages for five of her favorite basketball players. She orders the percentages from greatest to least. The percentages are shown as decimals rounded to the nearest thousandth. Complete the table by rounding each field goal percentage to the nearest tenth and the nearest hundredth.

Player Name	Field Goal Percentage	Field Goal Percentage (nearest tenth)	Field Goal Percentage (nearest hundredth)
Mason Plumlee	0.569		
Anthony Davis	0.565		
Amar'e Stoudemire	0.558		
Derrick Favors	0.553		
Cory Joseph	0.543		

Why do you think the field goal percentages were extended to the thousandths place rather than stopping at the tenths or hundredths place?

Answer: _____

Name _____

Standard 5.NBT.A.4

Unit 7 Skillful Thinking



1. Steve rounded a decimal number with three digits to the right of the decimal to the nearest hundredth.

What is the smallest number he could round to 0.05?

Answer: _____

What is the largest number Steve could round to 0.05?

Answer: _____

Explain your answer. _____



2. Sue is thinking of a decimal number that will fill these blanks:

_____ . _____

What is a number that will round to 18 if rounded to the nearest whole number and to 17.5 if rounded to the nearest tenth?

Answer: _____

Journal

Describe a situation in everyday life in which you round decimal numbers to estimate.



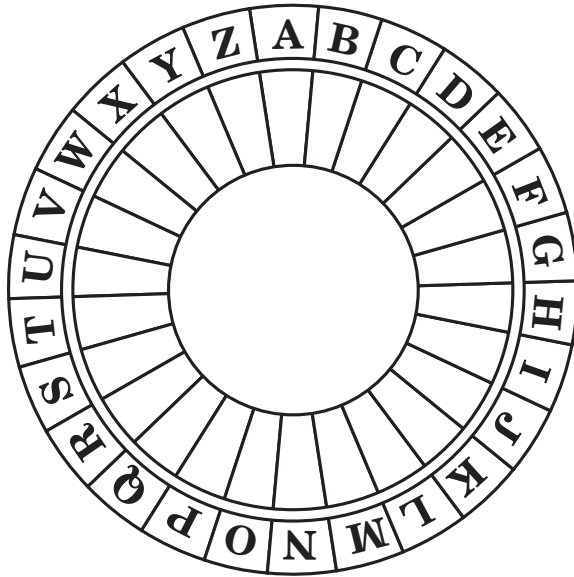
Name _____

Unit 7 Motivation Station

Standard 5.NBT.A.4

Secret Code Wheel

Solve problems for A–Z and write the answers in the inner sections of the secret code wheel.



Use the secret code to read this message.

91-2000-1000-300-910 35.9-690-79!

— — — — — !

Now use the secret code to write a message to a partner in the space provided. Exchange papers and decipher the messages.

A	Round 345 to the hundreds place.	N	Round 43.29 to the nearest tenth.
B	Round 78.9 to the nearest whole number.	O	Round 687.5 to the tens place.
C	Round 3.354 to the nearest hundredth.	P	Round 3838 to the thousands place.
D	Round 15.65 to the nearest tenth.	Q	Round 15.33 to the nearest tenth.
E	Round 1092 to the thousands place.	R	Round 2029 to the hundreds place.
F	Round 390.2 to the nearest whole number.	S	Round 120.39 to the hundreds place.
G	Round 90.89 to the nearest whole number.	T	Round 908.7 to the tens place.
H	Round 98.33 to the nearest tenth.	U	Round 555 to the hundreds place.
I	Round 783 to the hundreds place.	V	Round 370.2 to the nearest whole number.
J	Round 35.85 to the nearest tenth.	W	Round 1.453 to the nearest hundredth.
K	Round 3.921 to the nearest hundredth.	X	Round 287.4 to the nearest whole number.
L	Round 195.5 to the nearest whole number.	Y	Round 11.11 to the nearest tenth.
M	Round 38.3 to the tens place.	Z	Round 93 to the tens place.

Parent Activities

1. When shopping at a grocery or clothing store, have your child round the prices to the nearest whole dollar.
2. Use the Internet, newspaper, or television to find rainfall totals for your area. Then encourage your child to estimate the rainfall to the nearest half-inch. For example, a total of 1.4 inches would be about 1.5 inches of rain, whereas a total of 2.2 inches would be about 2 inches of rain.