

Objectives

- Estimate the sum of 3 or 4 addends by rounding to the place with the greatest value
- Estimate the sum or difference of 4-, 5-, and 6-digit numbers by rounding to the place with the greatest value
- Estimate the sum or difference by rounding each number to the place with the greatest value in the lesser number
- Add and subtract 4-, 5-, and 6-digit numbers

Teacher Materials

- Chart 6: *Halves, Thirds, Fourths*
- Multiplication flashcards: 5 as a factor, and previously reviewed multiplication facts

Student Materials

- Number Cards: 0–9

Practice and Review

Fractions: halves, thirds, and fourths

Review the fractions on the *Halves, Thirds, Fourths* chart. Emphasize that $\frac{2}{2}$, $\frac{3}{3}$, and $\frac{4}{4}$ are equal to 1 whole.

Multiplication facts: 5 as a factor

Introduce the Lesson

Seabirds generally live longer than other birds. Mostly they live along the coast and can often be seen flying over the ocean. They feed both at the ocean’s surface and below it.

Most seabirds nest in colonies which vary in size from a few dozen birds to millions; many migrate, crossing the equator or flying completely around the Earth. Some seabirds even spend part of the year away from the sea entirely.

People have found seabirds to be helpful. While these birds have been a source of food for hunters, they have also guided fishermen to places where there are lots of fish. Sailors lost at sea have sometimes been led to land by following seabirds.

Teach for Understanding

Estimate the sum of 3 or 4 addends and add

- **What is estimating?** *finding an answer close to the exact answer*
- **What does an estimated answer help you to know?** *if your exact answer is reasonable*

1. Explain that if you are not told which place to round a number to, you should round to the place with the greatest value.

One year the Hanson family traveled 2,175 miles while on their vacation. The next year they traveled 2,846 miles. This year they traveled 1,514 miles. How many miles did they travel in all for their vacations?

- **What is the question asking you to find?** *how many miles the Hansons traveled in all for their vacations*
- **What information is given?** *2,175 miles, 2,846 miles, 1,514 miles*
- **What operation will you use?** *addition*

- **What is your equation?** $2,175 + 2,846 + 1,514 = \underline{\quad}$
2. Write the equation and then write it vertically as shown. (Do not write the estimates or answer yet.)

$$\begin{array}{r} 2,000 \leftarrow 2,175 \\ 3,000 \leftarrow 2,846 \\ + 2,000 \leftarrow + 1,514 \\ \hline 7,000 \qquad 6,535 \end{array}$$

3. Remind the students that they can look at the digit immediately to the right of the rounding digit to determine whether to round up or to round down.
 - **Do you round 2,175 up or down to the nearest one thousand? Why?** *Down; elicit that you round down because the 1 in the Hundreds place is less than 5.*
 - **What one thousand do you round 2,175 to?** *2,000*
Write 2,000 in front of the arrow beside 2,175.
 - **Do you round 2,846 up or down to the nearest one thousand? Why?** *Up; elicit that you round up because the 8 in the Hundreds place is greater than 5.*
 - **What one thousand do you round 2,846 to?** *3,000*
Write 3,000 in front of the arrow beside 2,846.
 - **What one thousand do you round 1,514 to?** *2,000* **How do you know?** *Elicit that when there is a 5 to the right of the rounding digit as in the Hundreds place of 1,514, you round up.*
Write + 2,000 in front of the arrow beside + 1,514.
 - **What is the estimated sum?** *7,000*
Write the estimated answer.
4. Choose a student to solve the problem.
 - **What is the exact answer?** *6,535*
 - **How should you label the answer?** *miles*
Complete the equation: *6,535 miles.*
5. Follow a similar procedure using these problems.

$$\begin{array}{r} 20,000 \leftarrow 17,045 \\ 30,000 \leftarrow 34,036 \\ 10,000 \leftarrow 13,242 \\ + 30,000 \leftarrow + 25,632 \\ \hline 90,000 \qquad 89,955 \end{array} \qquad \begin{array}{r} 500,000 \leftarrow 426,099 \\ + 300,000 \leftarrow + 321,586 \\ \hline 800,000 \qquad 787,685 \end{array}$$

Estimate the difference

At the elementary school field day, 296 children ran the 100-meter dash and 138 children participated in the soccer kick. About how many more children ran the 100-meter dash than participated in the soccer kick?

- **What is the question asking you to find?** *about how many more children ran the 100-meter dash than participated in the soccer kick*
 - **Is this question asking for an exact answer? How do you know?** *No; it asks about how many more.*
1. Explain that sometimes an exact answer is not needed and an estimate is sufficient for solving the problem.
 - **What operation do you use?** *subtraction*
 2. Remind the students that this is a comparison problem; you are comparing the 2 sets of children by finding the estimated difference between them.
 - **How many children ran the 100-meter dash?** *296*
 - **Is 296 closer to 200 or 300? How do you know?** *300; possible answers: 296 is only 4 less than 300; the 9 in the Tens place is greater than 5.*
Write 300 for display.
 - **How many children participated in the soccer kick?** *138*

Estimate

Name _____

Estimate by rounding to the place with the greatest value in the smaller number. Solve.

Estimate

$$\begin{array}{r} \overset{1}{1,500} \\ + \overset{1}{700} \\ \hline 3,200 \end{array} \quad \begin{array}{r} \overset{11}{2,468} \\ + \overset{11}{699} \\ \hline 3,167 \end{array}$$

Estimate

$$\begin{array}{r} \overset{1}{62,000} \\ + \overset{1111}{9,000} \\ \hline 71,000 \end{array} \quad \begin{array}{r} \overset{1111}{62,497} \\ + \overset{1111}{8,623} \\ \hline 71,120 \end{array}$$

Estimate

$$\begin{array}{r} \overset{1}{47,000} \\ + \overset{1}{5,000} \\ \hline 52,000 \end{array} \quad \begin{array}{r} \overset{1}{46,518} \\ + \overset{1}{5,213} \\ \hline 51,731 \end{array}$$

Estimate

$$\begin{array}{r} \overset{3}{4,400} \\ - \overset{14}{900} \\ \hline 3,500 \end{array} \quad \begin{array}{r} \overset{3312}{4,426} \\ - \overset{312}{893} \\ \hline 3,533 \end{array}$$

Estimate by rounding to the place with the greatest value. Solve.

Estimate

$$\begin{array}{r} \overset{16}{30,000} \\ - \overset{16}{20,000} \\ \hline 10,000 \end{array} \quad \begin{array}{r} \overset{1611313}{27,143} \\ - \overset{1611313}{18,707} \\ \hline 8,436 \end{array}$$

Estimate

$$\begin{array}{r} \overset{999}{90,000} \\ - \overset{999}{50,000} \\ \hline 40,000 \end{array} \quad \begin{array}{r} \overset{9991010}{90,000} \\ - \overset{9991010}{47,635} \\ \hline 42,365 \end{array}$$

Estimate

$$\begin{array}{r} \overset{1}{500,000} \\ + \overset{1}{300,000} \\ \hline 800,000 \end{array} \quad \begin{array}{r} \overset{11}{506,297} \\ + \overset{11}{258,198} \\ \hline 764,495 \end{array}$$

Estimate

$$\begin{array}{r} \overset{1}{50,000} \\ + \overset{1}{10,000} \\ \hline 60,000 \end{array} \quad \begin{array}{r} \overset{1}{46,518} \\ + \overset{1}{12,621} \\ \hline 59,139 \end{array}$$

Solve and label.

8. An albatross flew 4,200 miles to find food for her baby chick. On another trip she flew 5,600 miles. How many miles were traveled in these two trips?

$$4,200 + 5,600 = 9,800 \text{ miles}$$



Complete the table.

	1,000 less		1,000 more		10,000 less		10,000 more
1.	4,216	5,216	6,216	3.	3,428	13,428	23,428
2.	6,562	7,562	8,562	4.	35,086	45,086	55,086

Subtract.

5.	99 96,002 - 4,867 91,135	6.	111 216,520 - 92,346 124,174	7.	999 30,006 - 17,248 12,758	8.	9 770,077 - 354,657 415,420
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Estimate by rounding to the place with the greatest value. Solve.

9.	Estimate 6,000 3,000 + 4,000 13,000	111 6,203 2,793 + 4,426 13,422	10.	Estimate 20,000 20,000 + 40,000 80,000	1111 24,035 17,362 + 35,847 77,244
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Write the fact family equations.

11. $8 \ 7 \ 15$

$$\begin{array}{r} 8 + 7 = 15 \\ 7 + 8 = 15 \end{array} \quad \begin{array}{r} 15 - 7 = 8 \\ 15 - 8 = 7 \end{array}$$

Write the rule for the table.

12. Rule: $b \ominus 100 = c$

b	c
600	500
1,462	1,362
6,087	5,987

Use the chart to solve and label.

13. What is the combined area of Banks Island and Somerset Island?
36,608 square miles
14. Estimate the total area of Devon Island and Russell Island. Round to the nearest hundred.
21,700 square miles
15. How much larger is Axel Heiberg Island than the combined area of Russell Island and Somerset Island?
6,741 square miles

Canadian Islands	
Islands	Area (square miles)
Axel Heiberg	16,671
Banks	27,038
Devon	21,331
Russell	360
Somerset	9,570

Complete **Daily Review** on page 60.

- Is 138 closer to 100 or 200? How do you know? 100; possible answers: 138 is less than 150; 3 in the Tens place is less than 5. Write - 100 below 300 and draw a line below it.
- What is the estimated answer? 200
- What should you label the answer? children
- Write the estimated answer: 200 children.
- About how many more children ran the 100-meter dash than participated in the soccer kick? about 200 children

Estimate the difference and subtract

Choose students to find the estimated answer for these problems and instruct other students to solve for the exact answer. Follow a procedure similar to the one in the first activity of this lesson.

$$\begin{array}{r} 50,000 \\ - 20,000 \\ \hline 30,000 \end{array} \leftarrow \begin{array}{r} 49,652 \\ - 23,804 \\ \hline 25,848 \end{array} \quad \begin{array}{r} 400,000 \\ - 300,000 \\ \hline 100,000 \end{array} \leftarrow \begin{array}{r} 381,421 \\ - 349,267 \\ \hline 32,154 \end{array}$$

Estimate the sum or difference

Last week 1,276 children visited the children's museum. This week 836 children came to the museum. About how many children visited the museum during both of these weeks?

- What is the question asking you to find? about how many children visited the museum during both weeks
- Do you need an exact answer or an estimate? How do you know? Estimate; the question asks about how many.
- What information is given? 1,276 children visited last week, and 836 visited this week.
- What operation will you use? addition

- What equation do you use? $1,276 + 836 = \underline{\quad}$
1. Write $1,276 + 836$ in vertical form for display.
- How is this addition problem different from the other ones you have estimated? Elicit that the addends have a different number of digits.
 - Which place do you think you should round to when the addends have a different number of digits? Answers will vary, but elicit that the estimate will be more accurate if you round to the place with the greatest value in the lesser number.
 - Which place do you round to when estimating this problem? Hundreds
 - Is 1,276 closer to 1,200 or 1,300? How do you know? 1,300; possible answers: the 7 in the Tens place or to the right of the rounding digit is greater than 5; 1,276 is 76 more than 1,200 and the halfway point between 2 hundreds is 50. Write 1,300 beside 1,276.
 - Is 836 closer to 800 or 900? How do you know? 800; possible answers: the 3 in the Tens place or to the right of the rounding digit is less than 5; 836 is only 36 more than 800. Write 800 beside 836.
 - What is the estimated sum? 2,100
 - About how many children visited the museum in all? 2,100
2. Follow a similar procedure for $5,724 - 389 = \underline{\quad}$
- $$5,700 - 400 = 5,300, \quad 375 + 21 = \underline{\quad} \quad 380 + 20 = 400, \quad 756 - 43 = \underline{\quad} \quad 760 - 40 = 720.$$
- (Note: You may want to choose students to find the exact answer to some of these problems to allow the students to see how close the estimates are to the exact answer.)



Worktext pages 51–52, 60 (i)