LESSON 91

• Multiplying Three-Digit Numbers, Part 1

Power Up

facts

Power Up 91

jump start

Count up by 11s from 0 to 121.

Count up by 5s from 6 to 56.

Write a multiplication and division fact family using the numbers 2, 4, and 8.

Draw a $2\frac{1}{2}$-inch segment on your worksheet. Then make it $2\frac{1}{2}$ inches longer. What is the total length of the segment?

mental math

a. **Number Sense:** 66 − 19

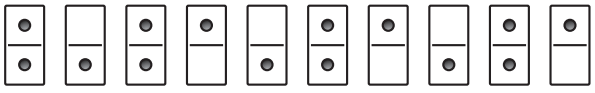
b. **Number Sense:** 24 + 38

c. **Calendar:** How many days are in 7 weeks?

d. **Estimation:** Round the value of these bills to the nearest ten dollars:

problem solving

Dina arranged dominoes into a repeating pattern. Below we show the first ten dominoes in the pattern.



Draw the next two dominoes in the pattern.

New Concept

Gwen and Theo are guessing the number of pennies in a jar. They cannot empty the jar and count the pennies, so they think of other ways to estimate the number of pennies.

Sometimes we want to find the answer to a "how many" question when we cannot count. We can use math sense to estimate how many instead. In the next few lessons, we will practice different methods of estimating.

Gwen and Theo found an empty jar like the penny jar. They put 200 pennies in the jar. The jar was only partly filled.

Gwen and Theo estimated that they would need 8 times as many pennies to fill the jar completely. They multiplied 8 times 200 to estimate how many pennies would fill the jar.

$$\begin{array}{r} 200 \\ \times \quad 8 \\ \hline 1{,}600 \end{array}$$

Analyze What fraction shows about what part of the second penny jar was filled?

Example 1

Find the product of 6 and 300.

Starting in the ones place, we multiply 0 ones by 6. The product is 0. Next, we multiply 0 tens by 6. The product is 0. Finally, we multiply 3 hundreds by 6. The product is 18 hundreds.

$$\begin{array}{r} 300 \\ \times \quad 6 \\ \hline \mathbf{1{,}800} \end{array}$$

Example 2

Multiply: 7 × $250.

This multiplication is similar to multiplying a two-digit number. First, we multiply 0 ones by 7. The product is 0.

$$\begin{array}{r} \$250 \\ \times \quad 7 \\ \hline 0 \end{array}$$

Next, we multiply 5 tens by 7. The product is 35 tens, which is $350. We record the 5 tens in the tens place and write the 3 hundreds above the 2.

$$\begin{array}{r} {\scriptstyle 3} \\ \$250 \\ \times \quad 7 \\ \hline 50 \end{array}$$

Finally, we multiply 2 hundreds by 7. The product is 14 hundreds. We add the 3 hundreds, so the total is 17 hundreds.

$$\begin{array}{r} {\scriptstyle 3} \\ \$250 \\ \times \quad 7 \\ \hline \$1750 \end{array}$$

The final product is **$1,750.**

Estimation by Volume

Materials: **Lesson Activity 31,** jar filled with pennies, empty jar, extra pennies

Your teacher has filled a jar with pennies to help your class practice estimating. Guess the number of pennies in the jar and write your guess on **Lesson Activity 31.** You might want to talk about why you guessed your number.

Then watch and count as pennies are put into an empty jar like the penny jar.

1. How many pennies were put into the empty jar?
2. About what fraction of the jar is filled with pennies?
3. How many sets of pennies of this size would be needed to fill the jar?
4. What numbers would you multiply to estimate the number of pennies in the full jar?
5. If you would like to make a new estimate of the number of pennies in the full jar based on your work in this activity, record the new estimate on **Lesson Activity 31.**

See student work.

Lesson Practice

Find each product.

a. 7×400

b. $8 \times \$300$

c. 6×340

d. $4 \times \$750$

Written Practice

Distributed and Integrated

1. (90) Bertram divided 30 model cars into five equal groups. How many model cars were in each group?

2. (50, 83) Roderick has a bag of 18 marbles. Half of the marbles are red and half are blue. Is drawing a red marble more likely, equally likely, or less likely than drawing a blue marble?

3. (Inv. 8) What geometric solid has one curved surface and one flat surface shaped like a circle?

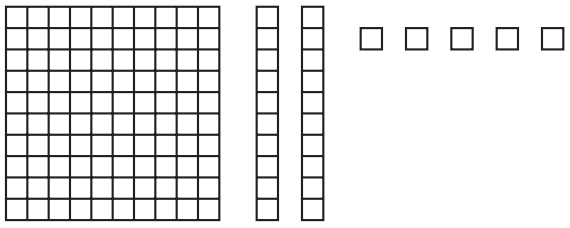
4. (82) Karen and Marie are sharing a bag of grapes. There are 18 grapes in the bag. If they share equally, how many grapes will there be for each of the girls?

5. (2, 59) Find the next three numbers in this doubling sequence:

$$\frac{1}{2},\ 1,\ 2,\ \_\_\_\_,\ \_\_\_\_,\ \_\_\_\_,\ \ldots$$

6. (81) Multiply 76 by 2 using pencil and paper.

7. (11, 84) **Multiple Choice** This picture shows the answer to which multiplication problem shown below?



A 25×10 **B** 25×5 **C** 21×5 **D** 20×6

8. (87) A gallon of milk equals how many pints of milk?

9. (91) **Formulate** A jar contains 200 pennies and is half full. Write a multiplication number sentence to estimate about how many pennies would fill the jar.

10. (9, 24) Find m: $100 = 20 + 30 + 40 + m$

11. (84) Find each product:

a. 60×3 **b.** 40×9

12. (52, Inv. 9) **Model** Draw a rectangle that is $1\frac{1}{4}$ inches long and $\frac{3}{4}$ inch wide. Then draw its two lines of symmetry.

13. (86) Find each quotient:

a. $18 \div 3$ **b.** $18 \div 2$ **c.** $16 \div 8$

14. (26) $\$6.75 - \$5.68$

15. (21, 26) $\$1 - 47¢$

16. (91) 130×2

17. (91) 6×100

18. (84) 5×32

19. (91) 600×5

20. (52, 58, 63) **a.** **Model** Use a pencil and ruler to draw a rectangle 4 inches long and 3 inches wide.

b. What is the perimeter of the rectangle?

c. What is the area of the rectangle?

LESSON 92

- Parentheses
- Using Compatible Numbers, Part 1

Power Up

facts

Power Up 92

jump start

Count up by odd numbers from 1 to 25.
Count up by even numbers from 2 to 30.

It is 6:35 in the morning. Draw hands on your clock to show the time in 2 hours. Write the time in digital form.

The temperature of the water at the beach was 76°F. The beach sand was 16 degrees warmer. Mark your thermometer to show the temperature of the beach sand.

mental math

a. **Fact Family:** Find the missing number in this fact family:

$3 \times \square = 12$ $\quad 12 \div \square = 3$

$\square \times 3 = 12$ $\quad 12 \div 3 = \square$

b. **Number Sense:** $46 + 22$

c. **Number Sense:** 15×100

d. **Time:** It is 10:28 p.m. How many minutes is it until 11:00 p.m.?

problem solving

The bookstore is advertising a special sale with this sign. The regular price for one book is $9. How much would it cost to buy 6 books while they are on sale?

New Concepts

Parentheses

Addition, subtraction, multiplication, and division are called **operations.** To solve some problems, we do more than one operation. In the expression below, we see there are two operations. The **parentheses** show us which operation to do first.

$$12 - (6 + 2)$$

Since $6 + 2$ is in parentheses, we first add $6 + 2$, which equals 8. Then we subtract 8 from 12.

$$12 - 8 = 4$$

Example 1

Simplify: $12 - (6 - 2)$

We do the operation inside the parentheses first: $6 - 2$ equals 4. Then we subtract 4 from 12.

$$12 - (6 - 2)$$

$$12 - 4 = \mathbf{8}$$

Example 2

Which is greater, $(12 \div 6) \div 2$ or $12 \div (6 \div 2)$?

We work inside parentheses first.

$(12 \div 6) \div 2$	$12 \div (6 \div 2)$
$2 \div 2$	$12 \div 3$
1	4

We see that **$12 \div (6 \div 2)$ is greater.**

Using Compatible Numbers, Part 1

When adding three numbers, it does not matter which two numbers we add first; the sum is the same.

$12 + (6 + 2)$	$(12 + 6) + 2$
$12 + 8$	$18 + 2$
20	20

A strategy to help add three or more numbers quickly is to look for **compatible numbers.** Compatible numbers are numbers that, together, are easy to work with. For example, numbers whose sums are round numbers are compatible numbers.

$$50 + 40 + 160$$

If we add from left to right, we first add 40 and 50 to get 90. Then we must add 90 and 160.

However, we might notice that $40 + 160 = 200$. If we add those numbers first, then our next addition is easy to perform mentally: $200 + 50 = 250$. We can use parentheses to show which addition we will perform first:

$$50 + (40 + 160)$$

Numbers that end in 25, 50, or 75 are also easy to work with because we can imagine counting with quarters.

Example 3

The supply closet has 75 crayons, 80 pens, and 25 pencils. How many writing tools are there altogether?

We recognize this as a "some and some more" story with three addends. We know that 75 and 25 total 100, so we choose to mentally add those addends first. Then we mentally add $100 + 80$ to get 180. There are **180 writing tools** altogether.

We can also use compatible numbers to estimate solutions to subtraction problems.

Example 4

Jasmine had $8.79. She spent $4.24 at lunch. About how much money does Jasmine have left?

To find the exact amount Jasmine has left, we would subtract $\$8.79 - \$4.24$. The amounts \$8.79 and \$4.24 are both very close to amounts we say when counting by quarters. We can rewrite the subtraction using compatible numbers this way: $\$8.75 - \$4.25$. We can perform this calculation quickly. **Jasmine has about $4.50 left.**

Lesson Practice

a. $12 - (6 \div 2)$

b. $(12 - 6) \div 2$

c. $12 \div (6 - 2)$

d. $(12 \div 6) - 2$

e. Compare: $(12 - 6) - 2 \bigcirc 12 - (6 - 2)$

For **f** and **g,** first write the pairs of compatible numbers. Then find the total.

f. $30 + 90 + 110$

g. $2 + 7 + 3 + 9 + 1$

h. Paolo spilled the puzzle pieces on the playground. The puzzle had 800 pieces but Paolo could only find 627. About how many puzzle pieces were lost? Write a subtraction number sentence using compatible numbers to find your answer.

Written Practice

Distributed and Integrated

(18, 22) **1.** The television cost $295. Sales tax was $20.65. What is the total price including tax?

(43) **2.** **Model** Use your fraction manipulatives to fit three $\frac{1}{4}$-pieces together to make $\frac{3}{4}$. Which is greater, $\frac{3}{4}$ or $\frac{1}{2}$?

(82) **3.** The zookeeper wants to split a bag of peanuts between the zoo's two elephants. There are 24 pounds of peanuts in the bag. If the elephants share equally, how many pounds of peanuts will there be for each of them?

(71) **4.** Draw a regular prism. A rectangular prism has how many

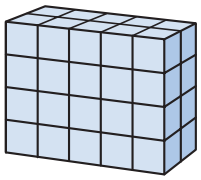
a. faces? **b.** edges? **c.** vertices?

(32) **5.** Write 895,283 in expanded form.

(1, 91) **6.** Multiply to find the number of days in two common years. Use pencil and paper to show your work.

(92) **7.** Rewrite this addition problem using compatible numbers, then add to estimate the sum: $824 + 747$.

8. (72) Patricia built this shape with 1-inch cubes.



a. How many cubes are in each layer?

b. How many layers are there?

c. How many cubes were used to make this shape?

d. What is the volume of the cube?

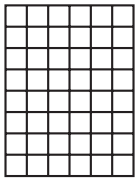
9. (30) Estimate the sum of $395 and $598.

10. (78) 4×60

11. (85) 75×7

12. (20, 25) **Analyze** Michael paid $5 for a model that cost $4.39 with tax. What coins should Michael get back in change?

13. (63) **Formulate** Write a multiplication fact that shows how many small squares cover this rectangle.



14. (2, 83) Find the next two numbers in this sequence:

48, 24, 12, _____, _____, …

15. (89) Find each quotient:

a. $30 \div 6$ **b.** $35 \div 5$ **c.** $32 \div 4$

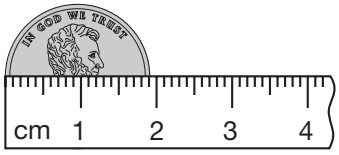
16. (92) $\$100 - (\$62 + \$9)$

17. (26) $\$5.50 - \$3.43$

18. (77, 92) $(7 \times 80) + 40$

19. (59) 5×12

20. (79) The distance across a penny is about how many centimeters?



LESSON 93

• Estimating Products

Power Up

facts

Power Up 93

jump start

Count up by 7s from 0 to 84.
Count up by 10s from 8 to 98.

Write a multiplication and division fact family using the numbers 2, 7, and 14.

Madison had a $10 bill. She bought a stamp set for $8.80. What is the fewest bills and coins she could receive for change?

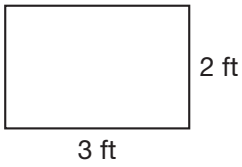
mental math

a. **Money:** $78 + $50

b. **Number Sense:** 6 × 30

c. **Number Sense:** 2 × 3 × 4

d. **Measurement:** Mohini's desk at home is 3 feet long and 2 feet wide. What is the area of her desk?



problem solving

The Pitzer family ordered an extra large pizza for dinner. The pizza was cut into 16 slices.

Mr. and Mrs. Pitzer ate 4 slices altogether. The oldest child, Clint, ate 3 slices. The other two children, Elisha and Jason, each ate 2 slices.

How many slices were left over? Did the family eat more than half of the pizza? Explain your answer.

New Concept

In Lesson 30 we estimated sums and differences. In this lesson we will estimate products.

Manny and two of his friends went to the amusement park. Each ticket cost $18. About how much did the three tickets cost altogether?

By rounding numbers before we multiply, we can estimate the answer to a multiplication problem. We round $18 to $20 and multiply to find the estimate: $20 \times 3 = \$60$. The three tickets cost about $60 altogether.

Example 1

Tickets to the professional basketball game were $38 each. Mr. Jones wanted to buy 4 tickets. Estimate the total price of the 4 tickets.

To estimate the total price we will round $38 to $40 before we multiply.

$$4 \times \$40 = \$160$$

The total price of the tickets is about **$160.**

Formulate Write an estimating products story problem for the multiplication $4 \times \$40 = \$160$.

Example 2

Jamal counted 195 words on one page. About how many words would Jamal read on 5 pages?

We can round 195 to 200. If we assume that each page has about the same number of words, then each page has about 200 words. To estimate the number of words on 5 pages, we multiply 200 by 5.

$$5 \times 200 = \mathbf{1{,}000}$$

Jamal would read **about 1,000 words** on 5 pages.

Lesson Practice

a. Estimate the total price of 4 water-park tickets at $19 each.

b. If tickets to the football game are $32 each, about how much would 5 tickets cost?

c. Every day Alida walks around the track 4 times. She counted 489 steps for one lap. About how many steps does she take walking 4 laps?

Written Practice

Distributed and Integrated

1. (60) Leticia sleeps nine hours each night. How many hours does she sleep in one week?

2. (26, 36) Bruce put stamps totaling 75¢ on the package. However, it cost $1.12 to mail the package. How much postage did Bruce need to add to the package?

3. (32) Luis flew a total of 2,200 miles from Los Angeles to Seattle and back to Los Angeles. Use words to write the number of miles that Luis flew.

4. (79) **Multiple Choice** Which of these measurements is a reasonable height for a ten-year-old person?

A 140 km **B** 140 m **C** 140 cm

5. (32) Write 3,000 + 700 + 40 in standard form.

6. (35, 52) Measure the length and width of this rectangle to the nearest quarter of an inch.

7. (87) List these units in order of size from smallest to largest:

quart gallon pint cup

8. (92) The first box weighed 48 pounds. The second box weighed 52 pounds. The third box weighed 39 pounds. Use compatible numbers to find the total weight mentally.

9. (92) (21 − 10) + 33

10. (84) Multiply:

a. 4 × 16 **b.** 6 × 24

11. *(93)* Estimate the product of 4 and 683.

12. *(90)* If 40 strawberries are placed equally in 5 bowls, how many strawberries will be in each bowl?

13. *(47)* **Model** Fit two $\frac{1}{8}$-pieces together. What larger fraction piece do they match?

14. *(86)* Find each quotient:

a. $40 \div 8$ **b.** $42 \div 7$ **c.** $45 \div 5$

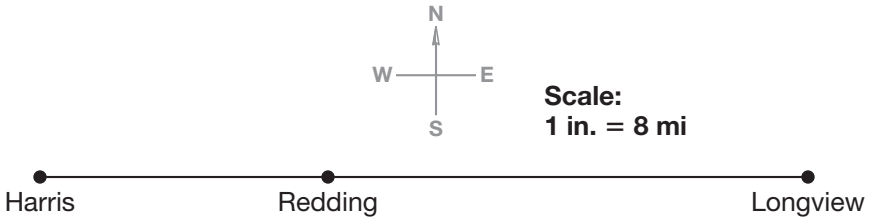
15. *(91)* 412×2

16. *(26)* $\$12.25 - \$9.89$

17. *(92)* $80 + (70 \times 6)$

18. *(92)* $(9 - 4) \times 4$

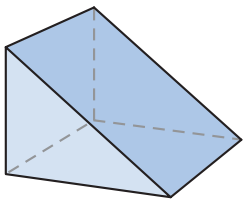
19. *(31, Inv. 4)* Use this map to answer the questions that follow:



a. Which town is east of Redding?

b. How many miles is Longview from Harris?

20. *(75)* **Classify** What is the geometric name for this figure? How many faces does it have?



LESSON 94

• Using Compatible Numbers, Part 2

Power Up

facts

Power Up 94

jump start

Count up by 6s from 0 to 66.
Count up by 12s from 0 to 132.

Draw a rectangle and divide it into 8 parts. Then shade 6 parts. What fraction of the rectangle is shaded?

Write "six hundred thirty four dollars and seventy two cents" using digits and a dollar sign.

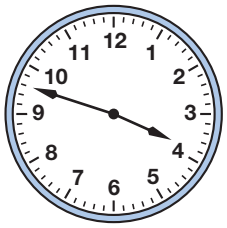
mental math

a. **Estimation:** Round 525 to the nearest ten.

b. **Number Sense:** 591 − 300

c. **Number Sense:** 65 + 45

d. **Time:** It is afternoon. What will be the time 5 hours after the time shown on the clock?



problem solving

Ms. Braden's third grade class is planning a picnic. The class will bring blankets to sit on at the picnic. Each blanket has enough space for 3 people to sit. There are 19 students in the class. How many blankets are needed so that all 19 students and Ms. Braden can have a place to sit?

New Concept

In Lesson 92 we learned to use compatible numbers in addition and subtraction problems. We also used compatible numbers to help estimate answers to arithmetic problems. Remember that instead of rounding addends or factors, we can choose nearby numbers that are easy to work with.

Problem		Easier Problem
76 + 73	→	75 + 75
26 × 4	→	25 × 4

We can mentally double 75 instead of adding 76 and 73. We can mentally multiply 25 × 4 by thinking of counting quarters instead of multiplying 26 × 4 with pencil and paper.

Example 1

Use compatible numbers to estimate each sum or difference.

a. $10.78 + $2.24

b. 294 + 74 + 322

c. $10.00 − $5.72

a. We can rewrite the addition as $10.75 + $2.25. The sum is **about $13.00.**

b. We can rewrite the addition as 300 + 75 + 325:

```
  300
   75
+ 325
  700
```

c. The second amount is close to $5.75: $10.00 − $5.75 = **$4.25.**

Example 2

Use compatible numbers to estimate the cost of 4 board games at $24 each.

The cost ($24) is close to $25. Multiplying $25 by 4 is easy because it is similar to counting quarters. Since 25 × 4 is 100, we estimate that the cost of the four games is about **$100.**

Use Compatible Number $25	Actual Problem
$25 × 4 = $100	$24 × 4 = $96

Analyze What is the difference between the estimate and the actual product? Explain the difference.

Lesson Practice

Use compatible numbers to estimate in problems **a** and **b.**

a. Estimate the product of 249 × 4.

b. When Alida walks her dog, she travels one mile in 24 minutes. About how long would it take Alida to walk 2 miles?

c. Estimate the difference of $678 and $354.

Written Practice

Distributed and Integrated

(18, 22) **1.** Phil bought an aquarium for $62.97. Sales tax was $4.41. What was the total price with tax?

(61) **2.** Brad is thinking of a number between 1 and 10. He gives this hint: "If I multiply the number by itself, the product is 49." What is Brad's number?

(93) **3.** Estimate the product of 82 and 4.

(32) **4.** There are 5,280 feet in a mile. Find the number of feet in two miles.

(29, 87) **5.** What words go in the blanks?

"Four _____ equal a dollar, and four _____ equal a gallon."

(90) **6.** Janet placed 60 books on 5 shelves equally. How many books are on each shelf?

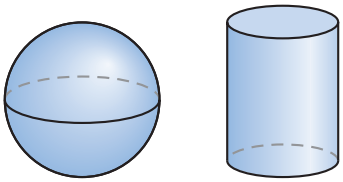
(15) **7.** Is 254 closer to 200 or 300?

(94) **8.** **Formulate** Rosa bought tickets to a concert. She paid $23 for each ticket. Use compatible numbers to estimate how much Rosa spent if she bought 5 tickets. Write a number sentence for the problem.

(84) **9.** Multiply:

a. 4 × $25 **b.** 8 × 34

10. *(75, Inv. 8)* **Explain** How are a sphere and a cylinder different?



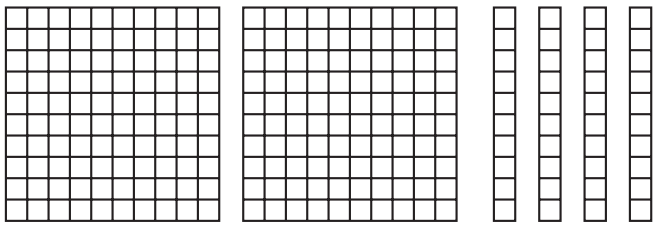
11. *(32)* Name the place value of the 5 in each of these numbers:

a. 45,321 **b.** 235

12. *(78)* Find each product:

a. 30×4 **b.** 6×90

13. *(78)* **Multiple Choice** This picture shows the answer to which multiplication?



A 6×40 **B** 20×7 **C** 2×12 **D** 2×40

14. *(86)* Find each quotient:

a. $48 \div 8$ **b.** $49 \div 7$ **c.** $42 \div 6$

15. *(77)* $7 \times 2 \times 5$

16. *(78)* 50×9

17. *(77, 84)* $3 \times 7 \times 9$

18. *(78, 92)* $100 - (3 \times 30)$

19. *(9, 24)* Find a: $36 + a + 17 + 42 = 99$

20. *(52, 63)* **Model** Draw a rectangle 5 cm long and 4 cm wide. What is the area of the rectangle?

LESSON 95

• Using Estimation to Verify Answers

Power Up

facts

Power Up 95

jump start

Count up by 5s from 7 to 57.

Count up by 4s from 0 to 44.

Draw a cube. How many vertices does a cube have?

Label the number line by fourths from 0 to $2\frac{2}{4}$. (Show these numbers: 0, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, and so on.)

mental math

a. **Number Sense:** $3 \times 3 \times 5$

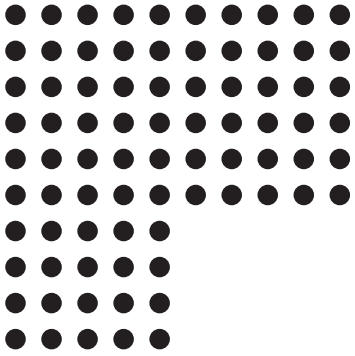
b. **Number Sense:** $72 + 28$

c. **Number Sense:** $40 + 23 + 60$

d. **Time:** Sharla finished the sack race in 55 seconds. Kevin finished in 70 seconds. How many more seconds did it take Kevin to finish the race than Sharla?

problem solving

Talia arranged one dollar in pennies in a square array on the table. Then Talia scooped some of the pennies into her hand. This diagram shows the pennies that remained. Without counting, find the number of pennies on the table. (*Hint:* Imagine the array of pennies that Talia scooped into her hand, and write a subtraction number sentence.)



New Concept

We can use estimation to check whether a count, a measure, or a calculation is reasonable. Read the story on the following page and decide if Amber's total is reasonable.

Amber wants to buy 3 shirts for $28 each. She decides not to buy the shirts when she multiplies 3 × $28 and gets $624 for the total.

Amber could estimate to check if the total is reasonable. She could round $28 to $30. Then she could multiply 3 × $30 and find that the total price of the three shirts should be about $90. Since $624 is not close to $90, Amber's total is not reasonable.

Evaluate What mistake did Amber make when she multiplied 3 × $28 and got $624 for the total?

Example 1

Francine bought a bat for $32, a mitt for $49, and a pair of batting gloves for $13. She calculated that she would need $94 for all three items. Is her total reasonable?

Francine calculated a total price. We will use estimation to see if her answer is reasonable.

To estimate the total price, we round $32, $49, and $13 before we add.

$$\$30 + \$50 + \$10 = \$90$$

Our estimate is close to $94, so **Francine's total is reasonable.**

Example 2

Cody counted 213 words on one page. After reading 5 pages, Cody estimated that he had read 1050 words. Is Cody's estimate reasonable?

We can round 213 to 200. If we assume that each page has about the same number of words, then each page has about 200 words. To estimate the number of words on 5 pages, we multiply 200 by 5.

$$5 \times 200 = 1000$$

Since 1050 pages is close to 1000 pages, **Cody's estimate is reasonable.**

Lesson Practice

a. Roger bought a new bike seat for $31 and a helmet for $29. He calculated that he would need $90 to pay for both items. Is Roger's total reasonable? Explain your answer.

b. Jackson estimates that 5 tickets to the football game will cost more than $300. If tickets are $32 each, is Jackson's estimate reasonable? If not, about how much would 5 tickets cost?

c. Every day Alida walks around the track 5 times. She counted 489 steps for one lap. She estimates that she will walk 2,500 steps in 5 laps. Is her estimate reasonable? Explain your answer.

Written Practice

Distributed and Integrated

1. (93) Estimate the cost of 7 uniforms at $62 each.

2. (40) After using 36 of the 100 stamps, how many stamps did Sidney have left?

3. (95) **Justify** Rachael bought 6 small bags of sunflower seeds. She found that there were 193 seeds in one bag. She estimated that there would be 1,800 seeds in all 6 bags. Is Rachael's estimate reasonable? Explain your answer.

4. (91) Find each product.

a. 3×400

b. $6 \times \$500$

c. 7×430

d. $5 \times \$320$

5. (46, 48) What mixed number is halfway between 1 and 2?

6. (81) A yard is 36 inches. Multiply to find the number of inches in 2 yards.

7. (93) A large bag of birdseed weighs about 38 pounds. Estimate the weight of 5 large bags of birdseed.

8. (87) 1 quart = _____ cups

9. (42) **Model** Draw a circle. Then divide the circle into fourths and shade one fourth of the circle.

10. (30) Estimate the difference when $298 is subtracted from $602.

11. (84) Multiply:

a. $4 \times \$35$ **b.** 3×21 **c.** 2×43

12. (91) 5×700

13. (91) 3×460

14. (24) $375 + 658 + 74$

15. (78, 92) $370 - (9 \times 40)$

16. (95) **Justify** Each table in the restaurant can seat 6 people. Lori counted 31 tables in the restaurant. She estimates that the restaurant can only seat a total of 100 people. Is her estimate reasonable? Why or why not?

17. (86) Find each quotient:

a. $28 \div 4$ **b.** $36 \div 6$ **c.** $48 \div 6$

18. (35) Use your ruler to find the length of this line segment to the nearest quarter of an inch.

_____

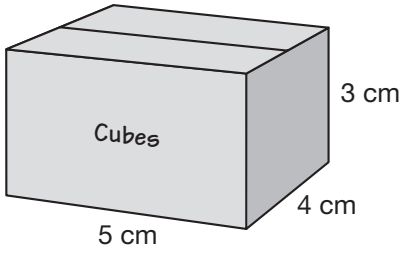
19. (2, 35) **Conclude** Counting by $\frac{1}{4}$s on a ruler, the order is

$$\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, \ldots$$

Find the next four numbers in this sequence:

$$1, 1\frac{1}{4}, 1\frac{1}{2}, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \ldots$$

20. (72, 73) This box is neatly filled with 1-centimeter cubes.



a. How many cubes fit in the bottom layer?

b. How many layers of cubes are there?

c. How many cubes are used to fill the box?

d. What is the volume of the box?

LESSON 96

• Rounding to the Nearest Dollar

Power Up

facts

Power Up 96

jump start

Count up by odd numbers from 1 to 25.
Count up by even numbers from 2 to 30.

Write a multiplication and division fact family using the numbers 3, 6, and 18.

Draw a $3\frac{1}{2}$-inch segment on your worksheet. Then make it $1\frac{1}{4}$ inches longer. What is the total length of the segment?

mental math

a. **Money:** $7.80 + $1.99

b. **Number Sense:** 39 + 22

c. **Number Sense:** 8 × 60

d. **Number Line:** Which point shows the number 370?

problem solving

The third grade students at Lincoln School made this pictograph to show the number of books read by each class.

Use the pictograph to find how many more books the students must read to reach a total of 180 books.

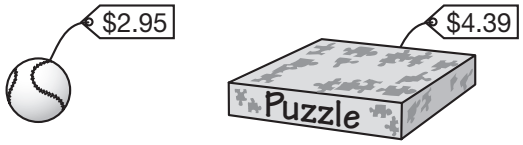
Number of Books Read	
Room 4	
Room 5	
Room 6	

Key = 10 books

New Concept

We can estimate with money by rounding dollars and cents to the nearest dollar.

What is the price of these two items rounded to the nearest dollar?



The price of the ball is between $2 and $3. Halfway between $2 and $3 is $2.50. Since $2.95 is greater than $2.50, the price is closer to $3.

The price of the puzzle is between $4 and $5. Halfway between $4 and $5 is $4.50. Since $4.39 is less than $4.50, the price is closer to $4.

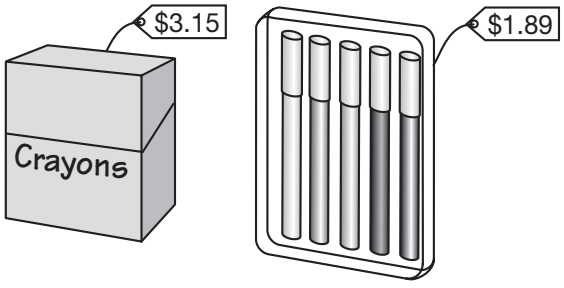
Example 1

Brad saw a game at the toy store that cost $5.85. The price is between what two nearby dollar amounts? Round the price to the nearest dollar.

The price $5.85 is **between $5 and $6.** Halfway from $5 to $6 is $5.50. Since $5.85 is more than $5.50, the price to the nearest dollar is **$6.**

Example 2

The price of a box of crayons is $3.15 and a set of colored markers is $1.89. Estimate the total price of the two items.



To estimate, we first round each price to the nearest dollar. Then we add to find the estimated total.

The $3.15 price rounds to $3.

The $1.89 price rounds to $2.

We add $3 and $2 and estimate that the total price is about **$5.**

Explain Explain why we rounded $3.15 down to $3.00.

Lesson Practice

For problems **a–d,** round each dollar and cent amount to the nearest dollar.

a. $4.90

b. $6.25

c. $8.19

d. $6.79

e. Estimate the total price of a rubber ball that costs $2.95 and a plastic bat that costs $5.82.

f. Estimate the total price of a bottle of milk at $1.89, a box of cereal at $3.92, and a bag of fruit at $4.17.

Written Practice

Distributed and Integrated

1. (39) Bert is 150 cm tall. Lou is 118 cm tall. How many centimeters does Lou need to grow to be as tall as Bert?

2. (60) Jenny bought ten cartons of eggs. There were a dozen eggs in each carton. How many eggs were there in ten cartons?

3. (96) The price of a box of greeting cards is $4.50. This price is between what two nearby dollar amounts? Round $4.50 to the nearest dollar.

4. (92) Add pairs of compatible numbers first to mentally find the total:

$$5 + 1 + 2 + 5 + 8 + 7$$

5. (88) List the five odd numbers that are between 10 and 20.

6. (91) Find each product:

a. 4×500

b. $3 \times \$800$

c. 5×720

d. $2 \times \$370$

7. (92) $(50 + 21) + 17$

8. (91) Kiondre and John put 300 pennies in the penny jar. They estimated that they would need 3 times that many pennies to fill the jar. About how many pennies would Kiondre and John need to fill the jar?

9. (75) **Model** Draw a triangular prism. Begin by drawing two congruent triangular faces.

10. (87) A half gallon is the same as how many quarts?

11. (33) What number is halfway between 3,000 and 4,000?

12. (35, 46) Counting by quarters on a ruler, the order is:

$$\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1$$

Find the next four numbers in this sequence:

$$2, 2\frac{1}{4}, 2\frac{1}{2}, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \ldots$$

13. (84) Multiply:

a. 4×15 **b.** 9×21 **c.** 8×45

14. (93) One bouquet of flowers costs $12. Estimate the cost of 9 bouquets of flowers.

15. (28) $\$20.00 - \$1.99$

16. (78, 92) $(63 + 37) \times 2$

17. (93) **Justify** It took 11 minutes for Jonathan to ride his bike one mile. He estimates that it will take him about an hour to ride his bike for six miles. Is his estimate reasonable? Why or why not?

18. (94) Use compatible numbers to estimate the products in **a** and **b**.

a. Estimate the product of 248×4.

b. Estimate the product of 19×5.

19. (86) Find each quotient:

a. $27 \div 3$ **b.** $56 \div 7$ **c.** $63 \div 9$

20. (88) Which of these numbers are even?

152 365 438

LESSON 97

• Multiplying Three-Digit Numbers, Part 2

Power Up

facts

Power Up 97

jump start

Count up by 25s from 0 to 250.
Count up by 10s from 0 to 110.

Aaron had a $10 bill. He bought a set of juggling balls for $4.65. Name the fewest bills and coins he could receive for change.

Use these clues to find the secret number. Write the secret number on your worksheet.

- two-digit number
- sum of digits is 8
- product of the digits is 0

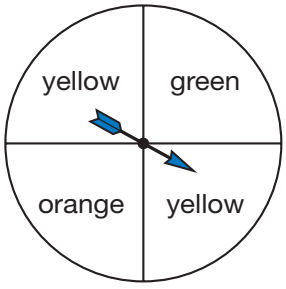
mental math

a. **Number Sense:** $2 \times 4 \times 6$

b. **Number Sense:** $130 + 22 + 70$

c. **Measurement:** How many centimeters are in 3 meters?

d. **Probability:** Waverly spins the spinner one time. Which color is the spinner most likely to land on?

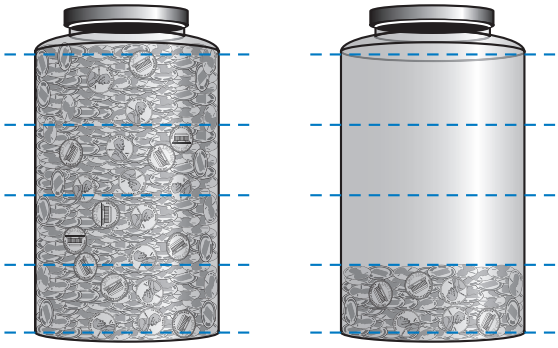


problem solving

Josh watched the night sky from 9:00 to 10:00 during the meteor shower. He saw twice as many meteors after 9:30 as he saw before 9:30. Josh counted 24 meteors altogether. How many meteors did Josh see before 9:30?

New Concept

To help them estimate the number of pennies in a full jar, Chad and Jodi filled up one jar with pennies. Then they put 234 pennies in a second jar that is similar in size.



The second jar is only partly filled. Chad and Jodi estimate that they would need 4 times as many pennies to fill the second jar completely. So they estimate that the number of pennies in the full jar is about 4×234.

To multiply a 3-digit number with pencil and paper, we multiply the ones, then the tens, then the hundreds.

$$\begin{array}{r} {\scriptstyle 1\,1} \\ 234 \\ \times\quad 4 \\ \hline 936 \end{array}$$

Discuss Look at the multiplication above. How many times do we need to regroup when we multiply 4×234? How can you tell?

Example 1

Find the product: 8×125

First, we multiply the 5 by 8. The product is 40. We record 0 in the ones place. We write the 4 tens of 40 above the 2.

$$\begin{array}{r} {\scriptstyle 4} \\ 125 \\ \times\quad 8 \\ \hline 0 \end{array}$$

Next, we multiply 2 tens by 8. The product is 16 tens. We add the 4 tens. The total is 20 tens. We record 0 in the tens place and write 2 above the 1.

$$\begin{array}{r} {\scriptstyle 2\,4} \\ 125 \\ \times\quad 8 \\ \hline 00 \end{array}$$

Finally, we multiply 1 hundred by 8. The product is 8 hundreds. We add 2 hundreds. The total is 10 hundreds. The final product is **1,000.**

$$\begin{array}{r} {\scriptstyle 24} \\ 125 \\ \times\quad 8 \\ \hline 1{,}000 \end{array}$$

Example 2

Chad compared the full penny jar with a jar that had 308 pennies. He thought the full jar had 7 times as many pennies, so he multiplied 308 by 7 to estimate the total. What was the product?

First, we multiply 8 by 7. The product is 56. We record the 6 in the ones place and write the 5 of 56 above the 0 in the tens place.

$$\begin{array}{r} {\scriptstyle 5} \\ 308 \\ \times\ \ 7 \\ \hline 6 \end{array}$$

Next, we multiply 0 tens by 7. The product is 0. We add 5 and record 5 in the tens place.

$$\begin{array}{r} {\scriptstyle 5} \\ 308 \\ \times\ \ 7 \\ \hline 56 \end{array}$$

Finally, we multiply 3 hundreds by 7. The final product is **2,156.**

$$\begin{array}{r} {\scriptstyle 5} \\ 308 \\ \times\ \ 7 \\ \hline 2{,}156 \end{array}$$

Lesson Practice

a. 6×135

b. 7×213

c. $4 \times \$275$

d. $3 \times \$232$

e. 8×706

f. $9 \times \$204$

Written Practice

Distributed and Integrated

1. *(Inv. 9)* **Model** Write the uppercase form of the ninth letter of the alphabet. Then draw its lines of symmetry.

2. *(18, 22)* Tamara bought a dress for $39.95. Sales tax was $2.60. What was the total price with tax?

3. *(30, 96)* Estimate the sum of $4.67 and $7.23 to the nearest dollar.

4. *(79)* **Multiple Choice** Which measurement is most likely the length of Vincent's pencil?

A 15 cm **B** 15 m **C** 15 km

5. *(82)* Stuart stacked seventeen books in two piles as equally as possible. How many books were in each stack?

6. (81) The window was twice as wide as it was high. If the window was 35 inches high, then how wide was it?

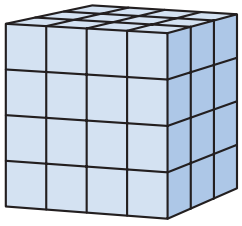
7. (95) **Justify** Susan estimated that 3 tickets to the baseball game will cost about $60. If tickets are $22 each, is her estimate reasonable? Why or why not?

8. (87) **Analyze** What words should be used in place of *w, y,* and *z* in this description?

Doubling a cup makes a __*w*__. Doubling a __*w*__ makes a __*y*__. Doubling a __*y*__ makes a __*z*__. Doubling a __*z*__ makes a gallon.

9. (93) **Formulate** Tyrone walks to school every day. He walks a total of 18 miles each month. Estimate the number of miles Tyrone walks in 5 months. Write a number sentence.

10. (73) Kumar used 1-inch cubes to build a rectangular solid like the one shown at right. How many 1-inch cubes did Kumar use to build the solid?



11. (84, 97) Multiply:

a. 4×210 **b.** 7×34

12. (86) Divide:

a. $2\overline{)12}$ **b.** $3\overline{)12}$

13. (96) Round $5.38 to the nearest dollar.

14. (97) 190×4

15. (97) 230×5

16. (24) $\$65 + \$350 + \$9$

17. (78, 92) $6 + (5 \times 80)$

18. (86) Find each quotient:

a. $42 \div 7$ **b.** $36 \div 4$ **c.** $64 \div 8$

19. Name the mixed numbers represented by points *A* and *B*.
(48)

20. **Model** Draw a rectangle that is 5 cm long and 3 cm wide.
(58, 63)

a. What is the perimeter of the rectangle?

b. What is the area of the rectangle?

Early Finishers
Real-World Connection

Tony wants to paint his clubhouse. He has $15 to spend on supplies. At the paint store, he chose one can of blue paint for $9.99, a paint brush for $4.82, and a pack of reptile wall stickers for $3.62. Does Tony have enough money to buy all of the supplies he chose? Explain your answer.

LESSON 98

• Estimating by Weight or Mass

Power Up

facts

Power Up 98

jump start

Count up by 9s from 0 to 108.

Count up by 5s from 8 to 58.

Write a multiplication and division fact family using the numbers 4, 4, and 16.

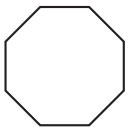
Draw a rectangle and divide it into 6 parts. Then shade 1 part. What fraction is *not* shaded?

mental math

a. **Money:** $200 − $136

b. **Number Sense:** 29 + 52

c. **Measurement:** What is the perimeter of this polygon? All sides are equal in length.



d. **Geometry:** Name the polygon that is shown in problem **c.**

problem solving

Ms. Hudson will pay to park her car in the parking garage. The cost is $3.50 for the first hour and $1.00 for each additional hour. Copy and complete this table to find the cost of parking a car in the garage for 6 hours.

Hours	Cost
1	$3.50

New Concept

Gwen and Theo weighed the penny jar to help them estimate the number of pennies in the jar. They found that the mass of the jar was about 5 kilograms. Then they measured the mass of eight rolls of pennies. They found that the mass of eight rolls of pennies, or 400 pennies, was about 1 kilogram.

Use the information above to solve example 1.

Example 1

Create a table to help you estimate the number of pennies in 5 kilograms. Assume that 400 pennies has a mass of 1 kilogram.

Since the mass of 400 pennies is about 1 kilogram, we count up by 400 pennies for each kilogram.

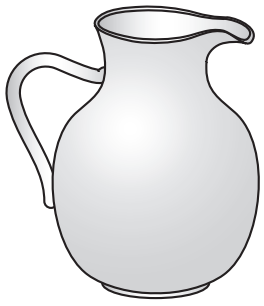
Number of Pennies	400	800	1,200	1,600	2,000
Mass of Pennies	1 kg	2 kg	3 kg	4 kg	5 kg

We estimate that 5 kilograms of pennies is about **2,000 pennies.**

Analyze How many rolls of pennies can you make from 2,000 pennies?

Example 2

Alison knows that a pint of water weighs about a pound. She weighs a pitcher of water and finds that it weighs 7 pounds. The empty pitcher weighs 3 pounds. How many pints of water are in the pitcher?



Since the empty pitcher weighs 3 pounds and the filled pitcher weighs 7 pounds, we know that there are 4 pounds of water in the pitcher.

$$\begin{array}{rl} 7 \text{ pounds} & \text{filled pitcher} \\ -\ 3 \text{ pounds} & \text{empty pitcher} \\ \hline 4 \text{ pounds} & \text{water} \end{array} \qquad \begin{array}{rl} 4 \text{ pounds} & \text{water} \\ +\ 3 \text{ pounds} & \text{empty pitcher} \\ \hline 7 \text{ pounds} & \text{filled pitcher} \end{array}$$

Since one pint of water weighs about one pound, we estimate that **4 pints** of water are in the pitcher.

Activity

Estimating by Mass

Materials: full penny jar and **Lesson Activity 31** from Lesson 91, extra penny rolls, balance scale

Find the mass of the penny jar. Then find how many rolls of pennies have a mass of 1 kilogram. Use the information to help you estimate the number of pennies in the jar. You may use the results to improve your estimate on **Lesson Activity 31.**

Lesson Practice

a. An empty bucket weighs 1 pound. When filled with water, the bucket weighs 9 pounds. A pint of water weighs about 1 pound. About how many pints of water were in the bucket?

b. If 1 kilogram of pennies is about 400 pennies, then 6 kilograms of pennies is about how many pennies? Make a table of number pairs to find the answer.

Written Practice

Distributed and Integrated

1. *(39)* Sal wants to buy a radio that costs $31.76 with tax. He has $23.50. How much more money does Sal need to buy the radio?

2. *(87)* A 5-gallon bucket is filled with water. How many quarts of water are in the bucket?

3. *(97)* Find the products:

a. 8×136 **b.** $9 \times \$151$

4. *(40)* Find the missing number: $20 - n = 8$

5. *(96)* The price of a pack of balloons is $5.49. The price of a pack of party hats is $3.29. Estimate the total price of the two items.

6. *(86)* Find the missing factor: $5 \times m = 40$

7. *(87)* A half gallon of milk is enough to fill how many cups?

8. (33) What number is halfway between 2,000 and 3,000?

9. (96) Katie is paid $7.75 per hour. Estimate how much Katie is paid for working 6 hours.

10. (98) **Formulate** If one pound of apples is about 4 small apples, then 6 pounds of apples is about how many apples? Make a table to help find the answer.

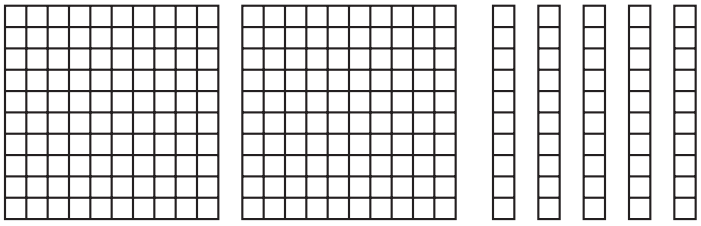
11. (91) Multiply:

a. 4×150 **b.** 3×630 **c.** 35×7

12. (86) Divide:

a. $4\overline{)12}$ **b.** $6\overline{)12}$

13. (84, 91) **Multiple Choice** This picture below shows the answer to which multiplication expression?



A 25×5 **B** 50×5 **C** 20×5 **D** 100×3

14. (86) Find each quotient:

a. $28 \div 4$ **b.** $42 \div 6$ **c.** $54 \div 9$

15. (26) $\$12.45 - \$5.75$

16. (97) 215×3

17. (78, 92) $(70 \times 5) - 50$

18. (24) $470 + 63 + 7 + 86$

19. Refer to this rectangle to answer the questions that follow:
(58, 63)

a. The rectangle is how many centimeters long?

b. The rectangle is how many centimeters wide?

c. What is the area of the rectangle?

d. What is the perimeter of the rectangle?

20. Mark and two friends want to use the swing during a 15-minute recess. To find out how long each of them could use the swing, Mark divided 15 minutes by 3. What should Mark's answer be?
(89)

Early Finishers
Real-World Connection

Carlos wants to buy a bottle of apple juice from the vending machine. A bottle of apple juice costs $0.75. He has five coins that total exactly $0.75. What five coins does Carlos have? You may use money manipulatives to help you find the answer.

LESSON 99

• Effects of Estimation

Power Up

facts

Power Up 99

jump start

Count up by 4s from 0 to 48.
Count up by 8s from 0 to 96.

It is night. The plane will depart at 13 minutes before 9:00. Draw hands on your clock to show the departure time. Write the time in digital form.

The daily high on Wednesday was 32°C. That night, the low temperature was 17 degrees cooler. Mark your thermometer to show the low temperature.

mental math

a. **Number Sense:** 50 − 18

b. **Time:** The music lesson lasted 35 minutes. The science lesson lasted 35 minutes. Altogether, how many minutes were the two lessons?

c. **Number Sense:** 9 × 50

d. **Money:** Fiona had $8.50. Then she spent $1.30. How much money did Fiona have left?

problem solving

During a storm, we hear thunder after we see lightning. We can tell how far away lightning is by how long it takes us to hear the thunder after we see the lightning. The sound of thunder travels about 1 mile every 5 seconds. Make a table to show how many seconds it takes the sound of thunder to travel 1, 2, 3, and 4 miles. Use the table to find how far away lightning occurs if we hear thunder 20 seconds after we see lightning.

Miles	Seconds
1	5

New Concept

When we estimate an arithmetic answer, we often need to know whether our estimate is a little more than or a little less than the exact answer.

Example 1

Deb bought 4 gallons of milk for $2.89 per gallon. To estimate the total cost, Deb multiplied 4 × $3. Will Deb's estimate be greater than or less than the exact cost?

Deb rounded up the price of the milk. The rounded price is greater than the exact price.

$$\$3.00 > \$2.89$$

Therefore, **Deb's estimate will be greater than the exact price.**

Estimate	>	Exact
$3.00		$2.89
× 4		× 4
$12.00		$11.56

Example 2

There are 26 students in each of the three classrooms. Nelson estimates that the total number of students in the classrooms is about 75 since 3 × 25 = 75. How does Nelson's estimate compare with the exact number of students?

Nelson used compatible numbers to estimate the total number of students. To multiply he chose a number less than the actual number of students in each classroom.

$$25 < 26$$

Therefore, **Nelson's estimate is less than the actual number of students.**

Estimate	<	Exact
25		26
× 3		× 3
75		78

Evaluate Sam wants to buy four books for $3.29 each. He estimates that he will need $12 for the books. If Sam has $12, will he have enough money to buy all 4 books? Explain your answer.

Lesson Practice

a. Sal bought a gallon of milk for $2.89 and a box of cereal for $3.95. He added $3 and $4 to estimate the total price. Is Sal's estimate greater than or less than the exact price?

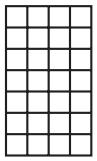
b. Thom is paid $9.15 per hour. Estimate how much Thom is paid for working 8 hours. Is your estimate greater than or less than Thom's exact pay?

Written Practice

Distributed and Integrated

1. *(34, 91)* From goal line to goal line on a football field is 100 yards. How many feet is 100 yards?

2. *(53)* **Formulate** Write a multiplication fact that shows how many small squares cover this rectangle.



3. *(99)* **Analyze** John bought a pair of sunglasses for $7.99 and a bottle of sunscreen for $8.90. He added $8 and $9 to estimate the total price. Is John's estimate greater than or less than the exact price?

4. *(98)* A plastic bag full of sweatshirts weighs 10 pounds. Two sweatshirts weigh about a pound. About how many shirts are in the bag?

5. *(97)* Multiply:

a. 2×227

b. $3 \times \$260$

6. *(22, 24)* $\$8.95 + \$2.89 + 43¢$

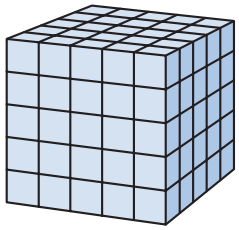
7. *(47)* **Multiple Choice** Which pair of fractions below is not equivalent?

A $\frac{1}{2}, \frac{2}{4}$ **B** $\frac{2}{3}, \frac{3}{4}$ **C** $\frac{2}{6}, \frac{1}{3}$ **D** $\frac{3}{6}, \frac{1}{2}$

8. *(87)* A gallon of punch is how many cups of punch?

9. *(96)* Estimate the difference when $2.95 is subtracted from $12.05.

10. *(73)* How many small cubes were used to make this big cube?



11. *(94)* Use compatible numbers to estimate the products in parts **a** and **b.**

a. Estimate the product of 252 × 2.

b. Estimate the product of 23 × 3.

12. *(84)* Multiply:

a. 4 × 40 **b.** 6 × 62

13. *(Inv. 9)* Trace this figure. Then draw two lines of symmetry.

14. *(92)* (25 + 75) × 4

15. *(84)* 75 × 3

16. *(28)* 1,306 − 567

17. *(97)* 708 × 6

18. *(86)* Find each quotient:

a. 56 ÷ 8 **b.** 45 ÷ 9 **c.** 63 ÷ 7

19. *(79)* Find the lengths of these segments to the nearest centimeter:

a. _____

b. _____

20. *(41)* Write a fraction with a numerator of 2 and a denominator of 5. Then use words to name the fraction you wrote.

LESSON 100

• Multiplying Dollars and Cents

Power Up

facts

Power Up 100

jump start

Count up by 6s from 0 to 72.

Count up by 12s from 0 to 144.

Write these amounts of liquid in order from least to greatest:

2 pints 2 gallons 2 cups 2 quarts

Label the number line by tenths from 0 to 1. (Show these numbers: 0, $\frac{1}{10}$, $\frac{2}{10}$, $\frac{3}{10}$, $\frac{4}{10}$, and so on.)

mental math

a. **Number Sense:** 54 + 60

b. **Geometry:** One cube has 6 faces. How many faces do 3 cubes have?

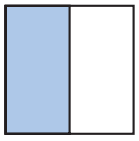
c. **Estimation:** Round 355 to the nearest ten.

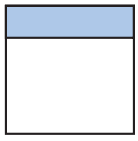
d. **Patterns:** Find the missing number in this pattern:

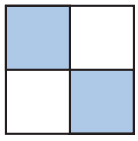
144	132	120	____	96	84

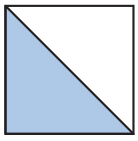
problem solving

Look for a pattern in these figures. Which figure does *not* belong? Explain your answer.

A 

B 

C 

D 

New Concept

In Lesson 92 we learned how to multiply three-digit numbers. We multiply dollars and cents the same way. After multiplying, we must remember to write the dollar sign and decimal point in the product.

Example 1

Sergio bought 3 tickets to the movie for $7.75 each. What was the total price of the 3 tickets?

We can find the total by adding or by multiplying.

$$\begin{array}{r} {\scriptstyle 2\ 1} \\ \$7.75 \\ \$7.75 \\ +\ \$7.75 \\ \hline \$23.25 \end{array} \qquad \begin{array}{r} {\scriptstyle 2\ 1} \\ \$7.75 \\ \times \quad 3 \\ \hline \$23.25 \end{array}$$

Notice that we write the dollar sign and the decimal point as part of the answer. The total was **$23.25.**

Example 2

Gwen put 430 pennies in a jar. She estimated that she would need 6 times as many pennies to fill the jar completely. She multiplied $4.30 by 6 to estimate the value of the pennies in the jar. What is the product?

We multiply 0 pennies by 6. The product is 0, which we record. Next, we multiply 3 dimes by 6. The product is 18 dimes, which is 1 dollar and 8 dimes.

$$\begin{array}{r} {\scriptstyle 1} \\ \$4.30 \\ \times \quad 6 \\ \hline 80 \end{array}$$

Finally, we multiply 4 dollars by 6. The product is 24 dollars. We add the dollar of dimes to make 25 dollars. The final product is **$25.80.**

$$\begin{array}{r} {\scriptstyle 1} \\ \$4.30 \\ \times \quad 6 \\ \hline \$25.80 \end{array}$$

Analyze Gwen estimated that the value of the pennies in the jar would be $25.80. How many pennies would be equal to $25.80?

Lesson Practice

Find each product.

a. $6 \times \$4.00$

b. $7 \times \$3.05$

c. $5 \times \$3.40$

d. $4 \times \$2.35$

Written Practice

Distributed and Integrated

1. (90) There were 32 books on the table arranged in four equal stacks. How many books were in each stack?

2. (99) Rob bought 5 bottles of juice for \$2.29 per bottle. To estimate the total cost, Rob multiplied $5 \times \$2$. Will Rob's estimate be greater than or less than the exact cost?

3. (54) **Formulate** Change this addition to a multiplication and find the total:

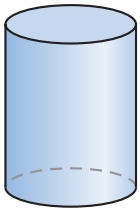
$$4 \text{ qt} + 4 \text{ qt} + 4 \text{ qt} + 4 \text{ qt} + 4 \text{ qt}$$

4. (Inv. 9) **Model** The upper case letter A has one line of symmetry. Write the upper case letter B and show its line of symmetry.

5. (96) Estimate the difference of \$14.92 and \$7.21.

6. (79) Use a pencil and a centimeter ruler to draw a segment 5 cm long. Then measure the segment with an inch ruler. The 5-cm segment is about how many inches long?

7. (75, Inv. 8) What is the geometric name for this solid? Describe the shape of its top and bottom faces.



8. (100) $\$1.51 \times 4$

9. (46) **Represent** Use symbols to write the mixed number two and two thirds.

10. (55) If $5 \times 12 = 60$, then what does 12×5 equal?

11. *(Inv. 4)* Gia is looking at a map. Each inch on the map represents 5 miles. Two schools that are 4 inches apart on the map are how many miles apart?

12. *(35)* What length is halfway between 1 inch and $1\frac{1}{2}$ inch? Use your ruler to find the answer.

13. *(93)* One plane ticket costs $415. Estimate the cost of two plane tickets.

14. *(78, 97, 100)* Multiply:

a. 5×40 **b.** 3×260 **c.** $4 \times \$1.25$

15. *(92)* **Analyze** Use mental math to find the sum. Begin by adding pairs of compatible numbers.

$$50 + 90 + 110$$

16. *(86)* Find each quotient:

a. $32 \div 4$ **b.** $48 \div 6$ **c.** $63 \div 9$

17. *(78)* 4×60

18. *(24)* $376 + 28 + 205 + 9$

19. *(40)* Find the missing number: $n - 3 = 15$

20. *(98)* If 1 box of pens has a mass of about 100 grams, then 6 boxes of pens have a mass of about how many grams? Make a table to help find the answer.

Focus on

• Evaluating Estimates

In Lesson 99 we learned one way to evaluate estimates we make. In this investigation, we will talk about other ways to evaluate estimates, and we will evaluate the estimates we made on **Lesson Activity 31.**

Ian counted 198 words on one page of his science lesson.

1. How could he estimate the number of words in the whole lesson if it is six pages long?

   Jerry, Talia, and Ian each estimated the number of words in the entire lesson. Their estimates are shown below:

Student	Estimate
Ian	1,200
Jerry	1,300
Talia	1,000

2. How can they find who made the closest estimate?

   The students counted the words on all six pages of the science lesson and found that there are 1,245 words altogether.

3. Whose estimate was closest?

Evaluating Estimates

In this activity, we will count the pennies in the penny jar we first saw in Lesson 91 and compare the estimates we made on **Lesson Activity 31** to the actual number of pennies.

4. Before counting pennies, make your last estimate of the number of pennies in the jar. Record the estimate on your activity sheet. Also write your name and last estimate on a piece of scrap paper and give it to your teacher.

5. Work in pairs to count the pennies your teacher gives you. Put groups of 50 pennies into penny rolls. Neatly stack or organize any extra pennies.
6. A volunteer should write the numbers of pennies counted by each pair of students on the board or overhead. Then add them together as a class to find the total number. How many pennies were in the jar altogether?
7. With the class, sort the numbers in the "First Estimate" envelope until you find the closest estimate to the actual count.
8. Repeat the sorting for the "Last Estimate."
9. Which collection of estimates is closer to the actual count, the first estimate or the last estimate?
10. Look at **Lesson Activity 31.** Which one of your estimates was closest to the actual count?
11. **Justify** How do you decide which number is closest?
12. Which estimation strategy helped you improve your estimate the most?