• Multiplying by Multiples of 10 and 100

Power Up

facts   Power Up F

count aloud Count by 12s from 12 to 60.

mental math
- **a.** **Time:** How many days are in a common year? … a leap year?
- **b.** **Time:** What time is 10 minutes after 1:55 p.m.?
- **c.** **Money:** The cost is $43 for one person. What is the cost for 6 people?
- **d.** **Fractional Parts:** $\frac{1}{2}$ of 50
- **e.** **Fractional Parts:** $\frac{1}{10}$ of 50
- **f.** **Fractional Parts:** $\frac{5}{10}$ of 50
- **g.** **Measurement:** One yard is 3 feet. How many feet is 35 yards?
- **h.** **Number Sense:** 9×9, $- 1$, $\div 2$, $+ 2$, $\div 6$

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Copy this multiplication problem and fill in the missing digits:

$$\begin{array}{r} 36 \\ \times \_\_ \\ \hline \_\_2 \end{array}$$

New Concept

The **multiples** of a number are the answers we get when we multiply the number by 1, 2, 3, 4, and so on. **Multiples of 10** all end in zero.

10, 20, 30, 40, 50, 60, …

Any multiple of 10 can be written as a number times 10.

$$20 = 2 \times 10$$
$$30 = 3 \times 10$$
$$40 = 4 \times 10$$

Multiples of 100 all end with at least two zeros.

$$100, 200, 300, 400, 500, 600, \ldots$$

Any multiple of 100 can be written as a number times 100.

$$200 = 2 \times 100$$
$$300 = 3 \times 100$$
$$400 = 4 \times 100$$

Analyze Which factors are common to 10, 100, and 1000?

When we multiply by a multiple of 10, we may multiply by the digit(s) in front of the zero and then multiply by 10. We will show this by multiplying 25 by 30.

The problem: $25 \times 30 =$

We think: $25 \times 3 \times 10 =$

We multiply 25 by 3: $75 \times 10 =$

Then we multiply 75 by 10: $75 \times 10 = 750$

Notice that the last step placed a zero after the 75. When we multiply by a multiple of 10, we may multiply by the digit(s) in front of the zero and then place a zero on the end of that answer.

This can be shown when we write a problem vertically. We may write the numbers so that the multiple of 10 is on the bottom and the zero "hangs out" to the right. Here we write 25 times 30 vertically. We multiply 25 by 3. Then we bring down the zero (multiply by 10) and find that 25×30 is 750.

$$\begin{array}{r} 1 \\ 25 \\ \times\ 30 \\ \hline 750 \end{array}$$

We may use a similar method to multiply by multiples of 100. When we multiply by a multiple of 100, we can write the problem so that *two* zeros "hang out" to the right. We show this by multiplying 25 by 300.

We write the problem with 300 on the bottom and its zeros out to the right. We multiply 25 by 3 hundreds and get 75 hundreds. We write 7500.

$$\begin{array}{r} 1 \\ 25 \\ \times\ 300 \\ \hline 7500 \end{array}$$

Example 1

Last season, a college basketball player played an average of 40 minutes per game and played 37 games. How many minutes did that player play last season?

We write the problem so that the multiple of 10 is on the bottom. We let the zero "hang out" to the right. Then we multiply.

$$\begin{array}{r} 2 \\ 37 \\ \times\ \ 40 \\ \hline 1480 \end{array}$$

The basketball player played **1480 minutes.**

Example 2

Shandra sold ten tickets to the school play to friends and relatives for $3.75 per ticket. How much money did Shandra collect from ticket sales?

When multiplying whole numbers by 10, we may simply attach a zero. The zero shifts all other digits one place to the left. However, when multiplying dollars and cents by 10, attaching a zero does not shift the other digits from their places:

$3.750 is the same as $3.75

This is because the decimal point sets the place values, and attaching a zero does not change the position of the decimal point. When multiplying dollars and cents by whole numbers, we position the decimal point in the answer so that there are two digits to the right of the decimal point.

$$\begin{array}{r} \$3.75 \\ \times\ \ \ \ \ 10 \\ \hline \$37.50 \end{array}$$

Shandra collected **$37.50** from ticket sales.

We can check our answer using a calculator and the inverse operation. What equation can we use to check our answer?

Lesson Practice Multiply:

a. 34×20 **b.** 50×48

c. 34×200 **d.** 500×36

e. 55×30 **f.** $\$1.25 \times 30$

g. 55×300 **h.** $\$1.25 \times 300$

i. 60×45 **j.** $\$2.35 \times 40$

k. 400×37 **l.** $\$1.43 \times 200$

Written Practice

Distributed and Integrated

Formulate For problems **1–3,** write an equation and find the answer.

1. Laura, Lesley, and Trinh equally shared a box of 1 dozen pencils. How
(21) many pencils did each girl receive?

2. Barak had $841 before he had to pay a $75 fee. After paying the fee,
(16) how much money did he have?

3. The sheet of stamps had 10 rows of stamps with 10 stamps in each
(13) row. How many stamps were on the sheet?

*4. **Analyze** What year came one century after Texas became the 28th
(28) state in 1845?

5. **List** Write the factors of 60.
(25)

6. 37×60
(29)

7. $37 \times 6 \times 10$
(18, 29)

8. 50×46
(29)

9. $60 \times \$0.73$
(29)

10. $50 \times (1000 - 200)$
(24, 29)

11. What is the place value of the 5 in 356?
(3)

12. Joaquin works part-time at a deli. Each day Monday through
(28) Friday, Joaquin must report to work 30 minutes before noon. At
what time must Joaquin report to work on those days?

13. **Analyze** How much money is $\frac{1}{2}$ of a dollar plus $\frac{3}{4}$ of a dollar plus $\frac{3}{10}$ of
(Inv. 2) a dollar?

14. What is the product of thirty-eight and forty?
(5, 29)

15. Use words to name the number 944,000.
(7)

16. 4637
(6)   2843
     + 6464

17. 4618
(9) − 2728

18. $60.00
(13) − $ 7.63

19. $364 \div 10$
(26)

*20. $7w = 364$
(18)

21. $\dfrac{364}{7}$
(26)

*22. (**Verify**) Think of a whole number. Multiply it by 2. Now add 1. Is the
(2, 15) final answer odd or even?

23. According to this calendar, what was the date of the
(28) third Sunday in May 1957?

MAY 1957						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

24. Multiple Choice The number 356 is between which pair of numbers?
(4)
A 340 and 350   **B** 350 and 360   **C** 360 and 370   **D** 370 and 380

25. (**Conclude**) What are the next three terms in this counting sequence?
(1))

..., 600, 700, 800, ____, ____, ____, ...

*26. a. Multiple Choice Which of these numbers has both 2 and 5 as
(25) factors?

A 205   **B** 502   **C** 250   **D** 202

b. (**Verify**) Explain your thinking.

27. Show how to check this division answer. Is the answer
(26) correct?

$\begin{array}{r} 43 \text{ R } 1 \\ 7\overline{)300} \end{array}$

28. a. Compare: $12 - (6 - 2)$ ◯ $(12 - 6) - 2$
(24)

b. Does the Associative Property apply to subtraction?

*29. Five tenths of a circle equals what decimal part of a circle?
(Inv. 2)

30. The cost of a 28-ounce jar of peanut butter at various stores is shown
(4, 13) in this table:

The Cost of Peanut Butter
(28 oz)

Type of Store	Cost
Convenience	$5.89
Supermarket	$4.19
Neighborhood	$5.49
Grocery	$4.35

a. Order the costs from greatest to least.

b. Which two stores have a cost difference of $1.30?

Early Finishers

Real-World Connection

Eva had 30 rolls of dimes. Each roll has fifty dimes. How many dimes does Eva have? What is the value of the 30 rolls of dimes? Show how you solved the problem.