Visual Learning Animation

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Why is it easy to multiply by 10, 100, and 1,000? [The basic fact will be the number times 1. Then you need to figure out how many zeros follow the basic fact.]

Notice the pattern.

$5 \times 7 = 35$
$50 \times 7 = 350$
$500 \times 7 = 3{,}500$

$5 \times 70 = 350$
$50 \times 70 = 3{,}500$
$500 \times 70 = 35{,}000$

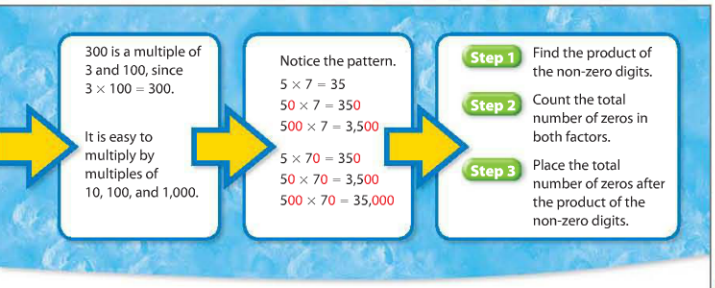
What patterns do you notice? [Sample answer: The product is the basic fact followed by the number of zeros in both factors.]

Step 1 Find the product of the nonzero digits.

Step 2 Count the total number of zeros in both factors.

Step 3 Place the total number of zeros after the product of the nonzero digits.

How can these steps be used to find 500 × 70? [$5 \times 7 = 35$; the product is this basic fact followed by three zeros; 35,000.]



Independent Practice

In **11** through **22**, use patterns and properties to compute mentally.

11. 120×30 **3,600**	**12.** $600 \times 40 \times 0$ **0**	**13.** $110 \times 2{,}000$ **220,000**	**14.** $800 \times 40 \times 3$ **96,000**
15. $3{,}000 \times 700$ **2,100,000**	**16.** $60 \times 90 \times 1$ **5,400**	**17.** 500×500 **250,000**	**18.** $1{,}000 \times 100$ **100,000**
19. 50×60 **3,000**	**20.** 70×80 **5,600**	**21.** 400×800 **320,000**	**22.** $1 \times 6 \times 250$ **1,500**

Problem Solving

23. A box of printer paper has 10 packages, with 500 sheets in each package. If a principal orders 10 boxes, how many sheets of paper does he order?
$500 \times 10 \times 10 = 50{,}000$ sheets of paper

24. Draw a Picture A post will be put on every corner and every 6 feet of a fence that is 42 feet long and 36 feet wide. How many posts are needed?
26 posts

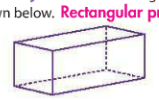
25. Writing to Explain Write a rule that tells how to use mental math to find the product of 30,000 × 50,000.
See margin.

26. Algebra $a \times b = 3{,}500$. If a and b are two-digit multiples of 10, what numbers could a and b represent?
Sample answer: 70, 50

27. Which is a possible solution for ☐ × ☐ × ☐ = 1,500?

A $50 \times 30 \times 0$ **C** $5 \times 30 \times 10$
B $3 \times 5 \times 10$ **D** $10 \times 5 \times 10$

28. Geometry Name the solid figure shown below. **Rectangular prism**



29. It takes Isaac 10 minutes to ride his bike down the hill to school and 20 minutes to ride up the hill from school. He attends school Monday through Friday. How many minutes does he spend biking to and from school in two weeks?
$(10 \times 10) + (10 \times 20) = 100 + 200 = 300$ minutes

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25. First, multiply the nonzero digits (3×5). Second, count the zeros in both factors. Finally, place the zeros after the product of the nonzero digits.

3 Independent Practice

Students may have difficulty using the properties of multiplication to simplify their computation. Remind students to look at the whole problem before they begin computing. Use Exercise 12 as an example. ***In Exercise 12, do you need to multiply to find the answer?*** [No; because 0 is a factor, the answer is 0.]

Problem Solving

Exercise	Content
23	Multiplication ($500 \times 10 \times 10$)
24	Use Logical Reasoning
25	Communicate Math Understanding Multiply Multiples of 10,000
26	Use Variables Multiply Multiples of 10
27	Multiplication Facts Multiply Multiples of 10
28	Solid Figures
29	Multiple-Step [$(10 + 20) \times 5 \times 2$]

Students use underlying processes and mathematical tools for Exercises 23–29. Remind students to check for reasonableness when solving each problem.

Exercise 27
Language of Math: Make Smart Choices Remind students to eliminate wrong answers by using mental math to compute each possible answer. ***Choice A cannot be correct, because 0 cannot be one of the factors if the product is 1,500.***