

Name _____

Multiply by Tens

Essential Question What strategies can you use to multiply by tens?

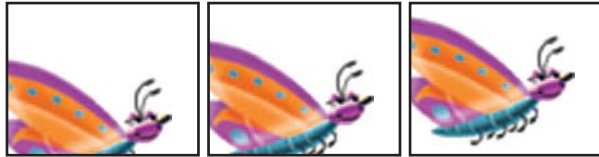


Number and Operations in Base Ten—4.NBT.B.5 Also 4.NBT.A.1

MATHEMATICAL PRACTICES
MP1, MP4, MP7

Unlock the Problem

Animation for a computer-drawn cartoon requires about 20 frames per second. How many frames would need to be drawn for a 30-second cartoon?



- The phrase “20 frames per second” means 20 frames are needed for each second of animation. How does this help you know what operation to use?

One Way Use place value.

Multiply. 20×30

You can think of 30 as 3 tens.

$$\begin{aligned} 20 \times 30 &= 20 \times \underline{\hspace{1cm}} \text{ tens} \\ &= \underline{\hspace{1cm}} \text{ tens} \\ &= 600 \end{aligned}$$

Another Way Use the Associative Property.

You can think of 30 as 3×10 .

$$\begin{aligned} 20 \times 30 &= 20 \times (3 \times 10) \\ &= (20 \times 3) \times 10 \\ &= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \\ &= \underline{\hspace{1cm}} \end{aligned}$$

So, frames would need to be drawn.

Remember

The Associative Property states that you can group factors in different ways and get the same product. Use parentheses to group the factors you multiply first.

Math Talk

MATHEMATICAL PRACTICES 7

Look for Structure How can you use place value to tell why $60 \times 10 = 600$?

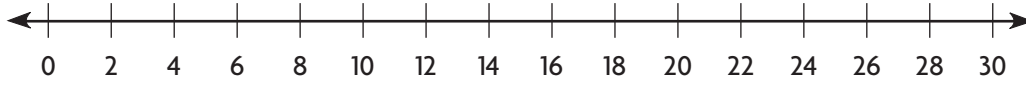
- Compare the number of zeros in each factor to the number of zeros in the product. What do you notice?



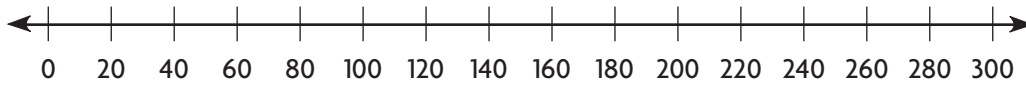
Other Ways

A Use a number line and a pattern to multiply 15×20 .

Draw jumps to show the product.



$15 \times 2 = \underline{\hspace{2cm}}$



$15 \times 20 = \underline{\hspace{2cm}}$

B Use mental math to find 14×30 .

Use the halving-and-doubling strategy.

STEP 1 Find half of 14 to make the problem simpler.

Think: To find half of a number, divide by 2.

$14 \div 2 = \underline{\hspace{2cm}}$

STEP 2 Multiply.

$7 \times 30 = \underline{\hspace{2cm}}$

STEP 3 Double 210.

Think: To double a number, multiply by 2.

$2 \times 210 = \underline{\hspace{2cm}}$

So, $14 \times 30 = 420$.

Try This! Multiply.

Use mental math to find 12×40 .

Use place value to find 12×40 .

Share and Show



1. Find 20×27 . Tell which method you chose. Explain what happens in each step.

Name _____

Choose a method. Then find the product.

2. 10×12

3. 20×20

4. 40×24

5. 11×60

On Your Own

Choose a method. Then find the product.

6. 70×55

7. 17×30

8. 30×60

9. 12×90

Math
Talk

MATHEMATICAL PRACTICES 7

Identify Relationships

How can you use $30 \times 10 = 300$ to find 30×12 ?

MATHEMATICAL PRACTICE 2

Reason Quantitatively Algebra Find the unknown digit in the number.

10. $64 \times 40 = 2,56 \blacksquare$

11. $29 \times 50 = 1, \blacklozenge 50$

12. $3 \blacklozenge \times 47 = 1,410$

$\blacksquare =$ _____

$\blacklozenge =$ _____

$\blacklozenge =$ _____

13. **Go Deeper** Caroline packs 12 jars of jam in a box. She has 40 boxes. She has 542 jars of jam. How many jars of jam will she have left when all the boxes are full?

14. **Go Deeper** Alison is preparing for a math contest. Each day, she works on multiplication problems for 20 minutes and division problems for 10 minutes. How many minutes does Alison practice multiplication and division problems in 15 days?

Problem Solving • Applications



Use the table for 15–16.

15. **MATHEMATICAL PRACTICE 4** **Use Graphs** How many frames did it take to produce 50 seconds of *Pinocchio*?

16. **GO DEEPER** Are there fewer frames in 10 seconds of *The Flintstones* or in 14 seconds of *The Enchanted Drawing*? What is the difference in the number of frames?

17. **THINK SMARTER** The product of my number and twice my number is 128. What is half my number? Explain how you solved the problem.

18. **THINK SMARTER** Tanya says that the product of a multiple of ten and a multiple of ten will always have only one zero. Is she correct? Explain.

19. **THINK SMARTER** For numbers 19a–19e, select Yes or No to tell whether the answer is correct.

19a. $28 \times 10 = 280$ Yes No

19b. $15 \times 20 = 300$ Yes No

19c. $17 \times 10 = 17$ Yes No

19d. $80 \times 10 = 800$ Yes No

19e. $16 \times 30 = 1,800$ Yes No

Animated Productions

| Title | Date Released | Frames per Second |
|--|---------------|-------------------|
| <i>The Enchanted Drawing</i> ® | 1900 | 20 |
| <i>Little Nemo</i> ® | 1911 | 16 |
| <i>Snow White and the Seven Dwarfs</i> ® | 1937 | 24 |
| <i>Pinocchio</i> ® | 1940 | 19 |
| <i>The Flintstones</i> ™ | 1960–1966 | 24 |



WRITE Math • Show Your Work • • • • •

Name _____

Multiply by Tens



COMMON CORE STANDARD—4.NBT.B.5
Use place value understanding and properties of operations to perform multi-digit arithmetic.

Choose a method. Then find the product.

1. 16×60

Use the halving-and-doubling strategy.

Find half of 16: $16 \div 2 = 8$.

Multiply this number by 60: $8 \times 60 = 480$

Double this result: $2 \times 480 = 960$

960

2. 80×22

3. 30×52

4. 60×20

Problem Solving



5. Kenny bought 20 packs of baseball cards. There are 12 cards in each pack. How many cards did Kenny buy?

6. The Hart family drove 10 hours to their vacation spot. They drove an average of 48 miles each hour. How many miles did they drive?

7. **WRITE** *Math* Write the steps for how to use a number line to multiply a 2-digit number by 20. Give an example.

Lesson Check (4.NBT.B.5)

1. For the school play, 40 rows of chairs are set up. There are 22 chairs in each row. How many chairs are there?
2. At West School, there are 20 classrooms. Each classroom has 20 students. How many students are at West School?

Spiral Review (4.OA.A.1, 4.OA.A.2, 4.OA.A.3, 4.NBT.B.4)

3. Alex has 48 stickers. This is 6 times the number of stickers Max has. How many stickers does Max have?
4. Ali's dog weighs 8 times as much as her cat. Together, the two pets weigh 54 pounds. How much does Ali's dog weigh?

5. Allison has 3 containers with 25 crayons in each. She also has 4 boxes of markers with 12 markers in each box. She gives 10 crayons to a friend. How many crayons and markers does Allison have now?
6. The state of Utah covers 82,144 square miles. The state of Montana covers 145,552 square miles. What is the total area of the two states?
