

Name _____

Multiply Using Mental Math

I Can multiply numbers using mental math and properties of operations.

Florida's B.E.S.T.

- Number Sense & Operations 4.NSO.2.2
- Algebraic Reasoning 4.AR.2.1
- Mathematical Thinking & Reasoning MTR.2.1, MTR.3.1, MTR.4.1, MTR.5.1



UNLOCK the Problem Real World

Properties of Multiplication can make multiplication easier.

There are 4 sections of seats in the Playhouse Theater. Each section has 7 groups of seats. Each group has 25 seats. How many seats are there in the theater?

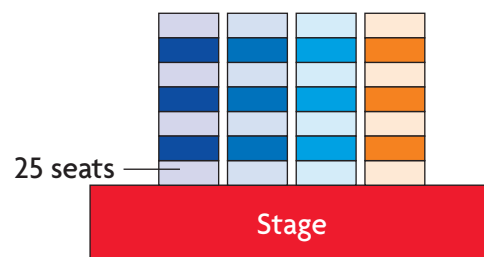
Find $4 \times 7 \times 25$.

$$4 \times 7 \times 25 = 4 \times 25 \times 7 \quad \text{Commutative Property}$$

$$= \underline{\hspace{2cm}} \times 7 \quad \text{Think: } 4 \times 25 = 100$$

$$= \underline{\hspace{2cm}} \quad \text{Think: } 100 \times 7 = 700$$

So, there are 700 seats in the theater.



Math Talk

MTR 3.1

Complete tasks with mathematical fluency.

What do you know about 4×25 that will help you find 6×25 ?

Try This! Use mental math and properties.

A Find $(6 \times 10) \times 10$.

$$(6 \times 10) \times 10 = 6 \times (10 \times 10) \quad \text{Associative Property}$$

$$= 6 \times \underline{\hspace{2cm}}$$

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

B Find $(4 \times 9) \times 250$.

$$(4 \times 9) \times 250 = 250 \times (4 \times 9) \quad \text{Commutative Property}$$

$$= (250 \times 4) \times 9 \quad \text{Associative Property}$$

$$= \underline{\hspace{2cm}} \times 9$$

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

Remember

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

Go Online For more help

More Strategies Choose the strategy that works best with the numbers in the problems.

Example

A Use friendly numbers.

Multiply. 24×250

Think: $24 = 6 \times 4$ and $4 \times 250 = 1,000$

$$24 \times 250 = 6 \times 4 \times 250$$

$$= 6 \times \underline{\hspace{2cm}}$$

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

B Use halving and doubling.

Multiply. 16×50

Think: 16 can be divided evenly by 2.

$$16 \div 2 = 8 \quad \text{Find half of 16.}$$

$$8 \times 50 = \underline{\hspace{2cm}} \quad \text{Multiply.}$$

$$2 \times 400 = \underline{\hspace{2cm}} \quad \text{Double 400.}$$

C Use addition.

Multiply. 4×625

Think: 625 is 600 plus 25.

$$4 \times 625 = 4 \times (600 + 25)$$

$$= (4 \times 600) + (4 \times 25)$$

$$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

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

D Use subtraction.

Multiply. 5×398

Think: 398 is 2 less than 400.

$$5 \times 398 = 5 \times (400 - 2)$$

$$= (5 \times \underline{\hspace{2cm}}) - (5 \times 2)$$

$$= 2,000 - \underline{\hspace{2cm}}$$

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

- What property is being used in Examples C and D? _____

Share and Show



- Break apart the factor 112 to find 7×112 by using mental math and addition.

$$7 \times 112 = 7 \times (\underline{\hspace{2cm}} + 12)$$

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

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

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

Find the product. Tell which strategy you used.

2. $4 \times 6 \times 50$

✓ 3. 5×420

✓ 4. 6×298

On Your Own

Find the product. Tell which strategy you used.

5. 14×50

6. 32×25

7. $8 \times 25 \times 23$

Use a strategy to find the product.

8. 16×400

9. $3 \times 31 \times 10$

10. 3×199

11. $3 \times 1,021$

MTR Use mental math to find the unknown number.

12. $21 \times 40 = 840$, so $21 \times 42 =$ _____.

13. $9 \times 60 = 540$, so $18 \times 30 =$ _____.

14. The science museum sells dinosaur models to schools and libraries for \$107 each. The town library buys 3 models. The town elementary school buys 5 models. What is the total cost of the models the town buys?

15. Russell and Farrah each buy 6 books of ride tickets at the fair. Each book has 15 tickets. How many tickets do they buy altogether?

**Math
Talk**

MTR 4.1 Engage in discussions on mathematical thinking.

How is using an addition strategy related to using a subtraction strategy?

Problem Solving · Applications

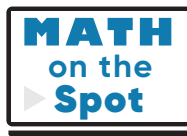
Use the table for 16–18.

16. Three thousand, forty-three people buy tickets at the gate for Section N and one hundred people buy tickets at the gate for Section L. How much money is collected for Section N and Section L at the gate?

Arena Ticket Prices Per Game			
Section	Full Season	15-Game Plan	Gate Price
K	\$44	\$46	\$48
L	\$30	\$32	\$35
M	\$25	\$27	\$30
N	\$20	\$22	\$25

17. **MTR** Tina and 3 of her friends buy the full season plan for Section M. If there are 45 games in the full season, how much money do they spend?

18. When the full season tickets first went on sale, 2,000 full season tickets sold for Section N. Two weeks after the tickets first went on sale, another 1,500 full season tickets were sold for Section N. How much money was spent on full season tickets for Section N in total? How much more money was spent when the tickets first went on sale than after the first two weeks?



Show the Math

Demonstrate Your Thinking

19. Jose and Daru are given an equation.

$$6 \times 407 = 2,442$$

Jose says the equation is false.

Daru says the equation is true.

Who is correct? Explain.

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Go Online

Interactive Examples

Find the product. Tell which strategy you used.

1. 6×297 **Think:** $297 = 300 - 3$
 $6 \times 297 = 6 \times (300 - 3)$
 $= (6 \times 300) - (6 \times 3)$
 $= 1,800 - 18$
 $= 1,782$
1,782;
use subtraction

2. $14 \times 25 \times 4$

3. 8×604

4. 50×28

Problem Solving

5. Section J in an arena has 20 rows. Each row has 15 seats. All tickets cost \$18 each. If all the seats are sold, how much money will the arena collect for Section J?
6. At a high-school gym, the bleachers are divided into 6 equal sections. Each section can seat 395 people. How many people can be seated in the gym?

7.  **WRITE** *Math* Show how to multiply 6×298 using friendly numbers and then using properties and mental math. Write about which method you like better and why.

Lesson Check

8. Pencils come in cartons of 24 boxes. A school bought 50 cartons of pencils for the start of school. Each box of pencils cost \$2. How much did the school spend on pencils?
9. The school also bought 195 packages of markers. There are 6 markers in each package. How many markers did the school buy?

Spiral Review

10. Alex has 175 baseball cards. Raul has 3 times as many baseball cards as Alex. How many fewer cards does Alex have than Raul?
11. A theater seats 1,860 people. The last 6 shows have been sold out. Estimate the total number of people attending the last 6 shows.

12. At one basketball game, there were 1,207 people. At the next game, there were 958 people. How many people were at the two games?

13. Tell whether each equation is true or false.

a. $4 \times 3 = 3 + 3 + 3$

b. $2 \times 6 = 6 + 6$

c. $8 + 8 + 8 + 8 + 8 + 8 + 8 + 8 = 8 \times 2$

d. $5 + 5 + 5 + 5 + 5 = 5 \times 5$