Name _____

Multiplying by Multiples of 10, 100, or 1,000

R 5-1

Patterns can help you multiply by numbers that are multiples of 10, 100, or 1,000.

$3 \times 5 = 15$	$2 \times 4 = 8$	$5 \times 7 = 35$
$3 \times 50 = 150$	$2 \times 40 = 80$	$5 \times 70 = 350$
$3 \times 500 = 1{,}500$	$2 \times 400 = 800$	$5 \times 700 = 3{,}500$
$3 \times 5{,}000 = 15{,}000$	$2 \times 4{,}000 = 8{,}000$	$5 \times 7{,}000 = 35{,}000$

To find each of the products above, first complete the basic multiplication fact, then write the same number of zeros seen in the factor that is a multiple of 10. For example:

$3 \times 500 = 1{,}500$

First find 3×5.	**$3 \times 5 = 15$**
Then, count the number of zeros in the multiple of 10.	**500 has 2 zeros.**
Write 2 zeros to form the product.	**1,500**

Find each product. Use mental math.

1. $8 \times 80 =$ _____

2. $6 \times 60 =$ _____

3. $7 \times 90 =$ _____

4. $5 \times 200 =$ _____

5. $3 \times 400 =$ _____

6. $7 \times 200 =$ _____

7. $5{,}000 \times 6 =$ _____

8. $6{,}000 \times 9 =$ _____

9. $3 \times 8{,}000 =$ _____

10. $6{,}000 \times 7 =$ _____

11. Number Sense To find 8×600, multiply 8 and 6, then write _____ zeros to form the product.

Name _____

Estimating Products

R 5-2

You can use rounding or compatible numbers to estimate products.

Estimate 7×28.

Using **rounding numbers**
Round 28 to 30.
7×30
$7 \times 30 = 210$

Using **compatible numbers**
Replace 28 with 25.
7×25
$7 \times 25 = 175$

Estimate each product.

1. 6×88 is close to $6 \times$ _____

2. 59×4 is close to _____ $\times 4$

3. 7×31 _____

4. 38×5 _____

5. 21×6 _____

6. 3×53 _____

7. 5×790 _____

8. 488×6 _____

9. **Number Sense** Estimate to tell if 5×68 is greater than or less than 350. Tell how you decided.

_____

_____

10. Estimate how many of Part C would be made in 4 months.

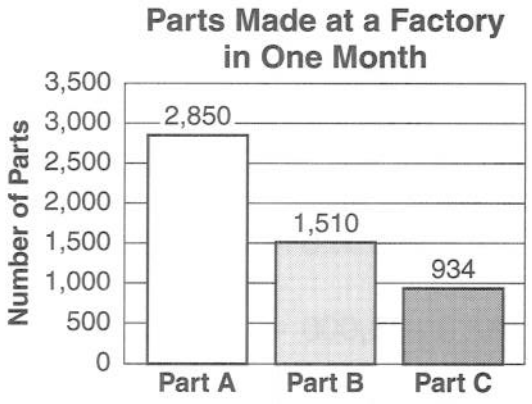
_____

11. Estimate how many of Part B would be made in 3 months.

_____

12. Estimate how many of Part A would be made in 9 months.

_____



Name _____

Mental Math

R 5-3

You can multiply mentally by breaking apart numbers or using compatible numbers.

Find 2×76 by breaking apart numbers.

Step 1: Use place value to break apart 76 into 70 and 6.

2×76

Step 2: Think of 2×76 as 2×70 and 2×6.

$2 \times 70 + 2 \times 6$

$140 + 12$

Step 3: Add the partial products to get the total.

$140 + 12 = 152$

$2 \times 76 = 152$

Find 4×19 using compatible numbers.

Step 1: Substitute a compatible number for 19 that is easy to multiply by 4.

19×4
$\downarrow$ Add 1 to make 20.
20×4

Step 2: Find the new product.

$20 \times 4 = 80$

Step 3: Now adjust. Subtract 1 group of 4.
$80 - 4 = 76$.

$4 \times 19 = 76$

Use mental math to find each product.

1. $5 \times 32 =$ _____

2. $7 \times 53 =$ _____

3. $66 \times 2 =$ _____

4. $92 \times 4 =$ _____

5. $31 \times 82 =$ _____

6. $4 \times 29 =$ _____

7. $18 \times 5 =$ _____

8. $6 \times 49 =$ _____

9. $68 \times 3 =$ _____

10. $4 \times 119 =$ _____

11. $107 \times 5 =$ _____

12. $131 \times 6 =$ _____

13. Algebra In $a \times b = 120$, a is a one-digit number and b is a two-digit number. What numbers could a and b represent?

_____

_____

Name _____

Using Arrays to Multiply

R 5-4

You can use arrays of place-value blocks to multiply.

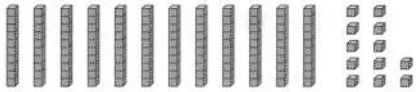
Find the product for 4×16.

What You Show	What You Write
 $4 \times 10 = 40$ $4 \times 6 = 24$ $40 + 24 = 64$	16 x 4 24 40 64	4 x 6 ones 4 x 1 tens

Use the array to find the partial product and the product. Complete the calculation.

1. 

$$\begin{array}{r} 12 \\ \times\ 3 \\ \hline \end{array}$$

2. 

$$\begin{array}{r} 22 \\ \times\ 6 \\ \hline \end{array}$$

3. $\begin{array}{r} 15 \\ \times\ 4 \\ \hline \end{array}$

4. $\begin{array}{r} 22 \\ \times\ 4 \\ \hline \end{array}$

5. $\begin{array}{r} 14 \\ \times\ 6 \\ \hline \end{array}$

6. $\begin{array}{r} 16 \\ \times\ 6 \\ \hline \end{array}$

7. $\begin{array}{r} 12 \\ \times\ 5 \\ \hline \end{array}$

8. $\begin{array}{r} 13 \\ \times\ 4 \\ \hline \end{array}$

9. $\begin{array}{r} 15 \\ \times\ 5 \\ \hline \end{array}$

10. $\begin{array}{r} 16 \\ \times\ 7 \\ \hline \end{array}$

11. Number Sense What two simpler problems can you use to find 4×22? (Hint: Think about tens and ones.)

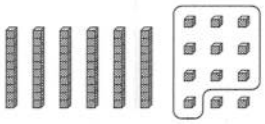
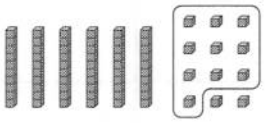
_____

Name _____

Multiplying Two-Digit and One-Digit Numbers

R 5-5

Here is how to multiply a two-digit number by a one-digit number using paper and pencil.

Find 3 × 24.	What You **Think**	What You **Write**
Step 1 Multiply the ones. Regroup if necessary.	 3 × 4 = 12 ones Regroup 12 ones as 1 ten 2 ones.	1 24 × 3 2
Step 2 Multiply the tens. Add any extra tens.	 3 × 2 tens = 6 tens 6 tens + 1 ten = 7 tens	1 24 × 3 72

Is your answer reasonable?

Exact: $3 \times 24 = 72$

Round 24 to 20.

Estimate: $3 \times 20 = 60$ Since 72 is close to 60, the answer is reasonable.

Find each product. Decide if your answer is reasonable.

1. 13 × 3

2. 17 × 7

3. 24 × 5

4. 48 × 8

5. 62 × 6

6. 36 × 5

7. 88 × 5

8. 52 × 8

9. Estimation Use estimation to decide which has the greater product: 813 × 6 or 907 × 5. _____

Name _____

Multiplying Three-Digit and One-Digit Numbers

R 5-6

Here is how to multiply larger numbers.

	Example A	Example B
Step 1 Multiply the ones. Regroup if necessary.	$\overset{1}{154} \times 4 = 6$	$\overset{2}{214} \times 7 = 8$
Step 2 Multiply the tens. Add any extra tens. Regroup if necessary.	$\overset{21}{154} \times 4 = 16$	$\overset{2}{214} \times 7 = 98$
Step 3 Multiply the hundreds. Add any extra hundreds.	$\overset{21}{154} \times 4 = 616$	$\overset{2}{214} \times 7 = 1{,}498$

Find each product. Estimate to check reasonableness.

1. 185×4

2. 517×4

3. 741×3

4. 413×6

5. 625×6

6. 381×5

7. 711×8

8. 802×5

9. Number Sense How could you use the product of 108 and 4 to find the product of 324 and 4?

_____

10. A factory can make 241 footballs in 1 week. How many can it make in 9 weeks?

_____

Name _____

PROBLEM-SOLVING STRATEGY **R 5-7**

Try, Check, and Revise

Yard Sale Andrew spent $26 at his neighbor's yard sale. He bought three items. Which items did he buy?

Yard Sale	
Binoculars	$12
Shoehorn	$ 3
Bowling ball	$ 8
Army boots	$ 5
Slingshot	$ 6

Read and Understand

Step 1: What do you know?

He bought three items.
He spent $26.

Step 2: What are you trying to find?

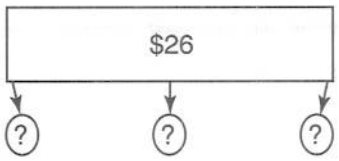
Which three items did he buy?

Plan and Solve

Step 3: What strategy will you use?

Strategy: Try, check, and revise

Show the Main Idea



Try: The binoculars are $12. I'll try it plus two other items.

Check: Check using $12 + $8 + $5 = $25. That's too low.

Revise: I'll keep the binoculars and bowling ball, but try the slingshot instead of the army boots.

Use previous tries: $12 + $8 + $6 = $26 That's it!

Answer: He bought the binoculars, a bowling ball, and a slingshot.

Look Back and Check

Is your work correct?
Yes, the sum is $26, and he bought three items.

Use the first try to help you make a second try. Finish solving the problems.

1. Henry's dad bought 27 screws and nails at the hardware store. He bought twice as many screws as he did nails. How many of each did he buy? Try 8 screws.
$8 \times 2 = 16$ screws. $16 + 4 = 20$. That's too low.

Name _____

Choose a Computation Method

R 5-8

When you compute, first try mental math. Next, think about paper and pencil. For very hard problems, use a calculator.

Cost of Summer Cottage Rental

Cottage	Cost/Week
A	$ 595
B	$1,045
C	$1,887

Example A

What is the cost of a two-week stay at Cottage A?

$2 \times \$595 = ?$

This is easy to do in my head. I'll use mental math.

$2 \times 600 = 1{,}200$

$1{,}200 - 10 = 1{,}190$

Cost: $1,190

Example B

What is the cost of a three-week stay at Cottage B?

$3 \times \$1{,}045 = ?$

There are a lot of regroupings. I'll use paper and pencil.

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 1{,}045 \\ \times\quad 3 \\ \hline 3{,}135 \end{array}$$

Cost: $3,135

Example C

What is the cost of a seven-week stay at Cottage C?

$7 \times \$1{,}887 = ?$

There are a lot of regroupings. I'll use a calculator.

Press: **7** [×] **1887**

[ENTER =]

Display: 13209

Cost: $13,209

Find each product. Tell what computation method you used.

1. $\begin{array}{r} 4{,}100 \\ \times\quad 4 \\ \hline \end{array}$

2. $\begin{array}{r} 5{,}170 \\ \times\quad 4 \\ \hline \end{array}$

3. $\begin{array}{r} 1{,}857 \\ \times\quad 7 \\ \hline \end{array}$

4. $\begin{array}{r} 6{,}253 \\ \times\quad 6 \\ \hline \end{array}$

5. Number Sense Gary used paper and pencil to find $6{,}005 \times 4$. Could he have found the answer a faster way? Explain.

_____

_____

_____

Name _____

Multiplying Money

R 5-9

The steps for multiplying money are almost exactly the same as the steps for multiplying whole numbers.

For example, a meal deal at the local fast-food restaurant costs $4.89. How much would it cost to eat there 3 days in a row?

Step 1

Multiply the same way as with whole numbers.

$$\begin{array}{r} {\scriptstyle 2\ 2} \\ \$4.89 \\ \times \quad 3 \\ \hline 14\ 67 \end{array}$$

Step 2

Write the answer in dollars and cents.

$$\begin{array}{r} {\scriptstyle 2\ 2} \\ \$4.89 \\ \times \quad 3 \\ \hline \$14.67 \end{array}$$

Remember, there are two digits to the right of the decimal point when separating dollars and cents.

It costs $14.67 to eat there 3 days in a row.

Find each product.

1. $\begin{array}{r} \$1.21 \\ \times \quad 3 \\ \hline \end{array}$

2. $\begin{array}{r} \$3.15 \\ \times \quad 4 \\ \hline \end{array}$

3. $\begin{array}{r} \$7.23 \\ \times \quad 5 \\ \hline \end{array}$

4. $\begin{array}{r} \$4.18 \\ \times \quad 4 \\ \hline \end{array}$

5. $\$5.17 \times 3 =$ _____

6. $\$70.14 \times 3 =$ _____

7. $\$18.57 \times 9 =$ _____

8. $\$62.53 \times 4 =$ _____

9. Estimation If a salad costs $3.99, is $29.99 enough to buy 9 orders? Explain.

_____

Find each cost.

10. 3 boomerangs _____

11. 4 softballs _____

Item	Price
Boomerang	$6.49
Softball	$4.89

Name _____

Multiplying Three Factors

R 5-10

You can use the Commutative and Associative Properties of Multiplication to make it easier to multiply 3 factors.

Commutative Property of Multiplication:

You can multiply any two numbers in any order.

$2 \times 3 = 3 \times 2$

Associative Property of Multiplication:

You can change the grouping of the factors.

$4 \times (2 \times 3) = (4 \times 2) \times 3$

Here are three ways to find $20 \times 2 \times 3$.

Example A	Example B	Example C
Multiply 20 and 2 first.	Multiply 2 and 3 first.	Multiply 20 and 3 first.
$20 \times 2 = 40$	$2 \times 3 = 6$	$20 \times 3 = 60$
$(20 \times 2) \times 3$	$20 \times (2 \times 3)$	$(20 \times 3) \times 2$
$40 \times 3 = 120$	$20 \times 6 = 120$	$60 \times 2 = 120$

1. $5 \times 3 \times 6 =$ _____

2. $50 \times 4 \times 2 =$ _____

3. $3 \times 30 \times 5 =$ _____

4. $4 \times 5 \times 60 =$ _____

5. $8 \times 2 \times 15 =$ _____

6. $6 \times 5 \times 10 =$ _____

7. $14 \times 2 \times 3 =$ _____

8. $50 \times 7 \times 5 =$ _____

9. Number Sense For $20 \times 5 \times 6$, is it easier to find 20×5 or 20×6 mentally? Why?

_____

_____

10. Show three ways to find $4 \times 25 \times 2$.

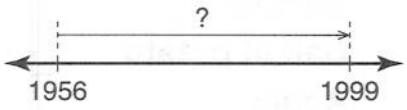
_____

Name _____

PROBLEM-SOLVING SKILL **R 5-11**

Choose an Operation

Understanding when to choose a particular operation can help you solve problems.

READ AND UNDERSTAND **Show the main idea.**	The average male giraffe is 3 times taller than Ramon. Ramon is 6 feet tall. How tall is the average male giraffe? ☐ Ramon's height ☐☐☐ Average giraffe's height: 3 times as tall	A goldfish named Tish lived from 1956 to 1999. How many years did Tish live? 
PLAN AND SOLVE **Choose an operation.**	Multiply to find "times as tall." 6 × 3 = 18 Ramon's height; Times as tall; Average giraffe's height	Subtract to compare the numbers. 1999 − 1956 = 43 Year died; Year born; Years in between

Draw a picture to show each main idea. Then choose an operation and solve each problem.

1. If there are 4 qt of milk in 1 gal, and 2 pt in 1 qt, how many pints are in 5 gal?

2. Runner A ran 844 mi last year. Runner B ran 1,063 mi. How many more miles did Runner B run than Runner A?

Name _____

PROBLEM-SOLVING APPLICATIONS **R 5-12**

The Grocery Store

Caleb is preparing a meal for his friend. The chart shows the number of calories in each type of food.

Food	Amount	Grams	Calories
Seedless raisins	1 c	145	435
Salted butter	1 tbsp	14	100
Banana	1	114	105
Baked potato	1	156	145
Apple	1	138	80
Sardines	3 oz	85	175

Use mental math. How many calories are in:
3 tbsp of salted butter? 300 calories
4 apples? 320 calories

Use the chart above to answer the following questions.

1. How many calories are there in 7 baked potatoes?

$$\begin{array}{r} {\scriptstyle 3} \\ 145 \\ \times \quad 7 \\ \hline \square\square 5 \end{array}$$

_____

2. How many calories are there in 8 c of seedless raisins? _____

3. How many grams are there in 6 oz of sardines? _____

4. Use mental math to find out how many calories are in 4 bananas. _____