Important Concepts . . .

Preview Review

Mathematics Grade 5 TEACHER KEY

W1 - Lesson 5: Multiplication

V5-07

Important Concepts of Grade 5 Mathematics

W1 - Lesson 1 .....Number Sense Numbers 0 to 100 000
W1 - Lesson 2 ..... Exploring Proper Fractions
W1 - Lesson 3 ..... Exploring Decimals
W1 - Lesson 4 .....Numbers With Up to 2 Decimal Places
W1 - Lesson 5 ..... Multiplication
W1 - Quiz
W2 - Lesson 1 ..... Division
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W2 - Lesson 3 .....Estimating and Taking Measurements
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W3 - Lesson 1 ..... Volume, Capacity, Mass, and Time
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W3 - Lesson 3 .....Transformations
W3 - Lesson 4 ..... Statistics and Probability
W3 - Lesson 5 .....Chance and Probability
W3 - Quiz

Materials Required

Protractor
Ruler
Calculator

A textbook is not needed.

This is a stand-alone course.

Mathematics Grade 5
Version 5
Preview/Review W1 - Lesson 5 TEACHER KEY

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Preview/Review Concepts for Grade Five Mathematics

TEACHER KEY

W1 - Lesson 5: Multiplication

OBJECTIVES

By the end of this lesson, you should

- multiply by 10, 100, 1000, etc.
- determine multiples and factors
- understand prime and composite numbers
- use factor trees
- multiply with decimal numbers

Glossary of Terms

Composite Number: A whole number that is greater than 1 and has more than two factors is a composite number. It is the opposite of a prime number.

Example: 8 is a composite number. It has 4 factors: 1, 2, 4, and 8.

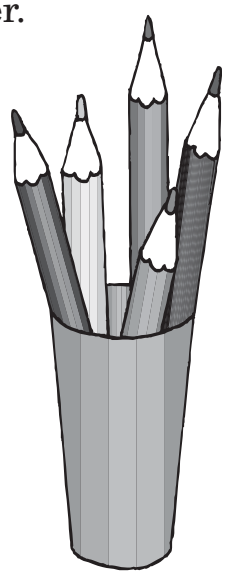
$$1 \times 2 \times 4 = 8$$

Factors: The numbers multiplied in a multiplication expression are factors.

Example: $4 \times 7 = 28$
(Both 4 and 7 are factors; 28 is the product.)

Multiple: Multiples are found by multiplying the number and another whole number.

Example: The multiples of 5 are 5, 10, 15, 20, 25, etc.



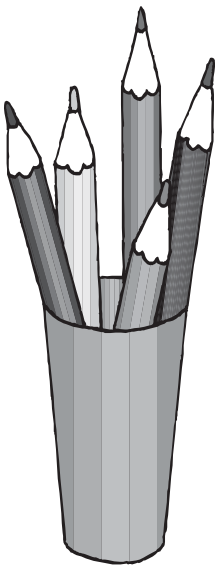
Prime Number: A prime number is a whole number that is greater than 1 and has only two factors, the number one, and itself. (It is the opposite of a Composite Number.)

Example: 7 is a prime number.
It has two factors, 7 and 1.

Product: The answer in multiplication is the product. Each multiplication question has factors multiplied to find the product.

Example: $6 \times 9 = 54$
(54 is the product; both 6 and 9 are factors.)

$$\underset{\text{Factors}}{6 \times 9} = \underset{\text{Product}}{54}$$



W1 - Lesson 5: Multiplication

Concepts:

- Mental Math
- Prime Numbers and Composite Numbers
- Number Factors
- 3-Digit by 2-Digit Multiplication
- Multiplication with Decimals

Mental Math

Complete as many as you can in **one minute**.
Begin with the ones you know.

0 ´ 7 = ***0*** 1 ´ 4 = ***4*** 7 ´ 3 = ***21*** 1 ´ 6 = ***6*** 3 ´ 1 = ***3***

8 ´ 8 = ***64*** 5 ´ 2 = ***10*** 3 ´ 7 = ***21*** 8 ´ 2 = ***16*** 4 ´ 4 = ***16***

9 ´ 8 = ***72*** 4 ´ 2 = ***8*** 1 ´ 3 = ***3*** 5 ´ 6 = ***30*** 9 ´ 6 = ***54***

4 ´ 5 = ***20*** 5 ´ 7 = ***35*** 4 ´ 2 = ***8*** 2 ´ 1 = ***2*** 2 ´ 2 = ***4***

9 ´ 2 = ***18*** 9 ´ 3 = ***27*** 3 ´ 6 = ***18*** 3 ´ 8 = ***24*** 8 ´ 4 = ***32***

Multiples of 10, 100 and 1 000

To multiply a number by 10, just add a zero to the number.

To multiply a number by 100, just add two zeros.

To multiply a number by 1 000, just add three zeros.

Example:	$14 \times 10 = 140$	(add one zero)
	$229 \times 100 = 22\,900$	(add two zeros)
	$384 \times 1\,000 = 384\,000$	(add three zeros)

Try the following.

$65 \times 100 =$ ***6 500***	$10 \times 13 =$ ***130***	$984 \times 10 =$ ***9 840***
$94 \times 100 =$ ***9 400***	$12 \times 10 =$ ***120***	$981 \times 1\,000 =$ ***981 000***
$100 \times 7 =$ ***700***	$81 \times 1\,000 =$ ***81 000***	$10 \times 432 =$ ***4 320***
$1\,000 \times 35 =$ ***35 000***	$1\,000 \times 4 =$ ***4 000***	$47 \times 100 =$ ***4 700***
$8 \times 4 \times 100 =$ ***3 200***	$11 \times 2 \times 100 =$ ***2 200***	$3 \times 30 \times 10 =$ ***900***

Multiples of Ten

If both factors are multiples of 10, multiply by 10 twice.

Example: $50 \times 40 = 5 \times 4 \times 10 \times 10$
$= 20 \times 10 \times 10$
$= 200 \times 10$
$= 2\,000$

Find the products.

60 ´ 30 = ***1 800*** 90 ´ 60 = ***5 400*** 70 ´ 40 = ***2 800***

40 ´ 20 = ***800*** 70 ´ 50 = ***3 500*** 60 ´ 50 = ***3 000***

30 ´ 70 = ***2 100*** 80 ´ 40 = ***3 200*** 90 ´ 90 = ***8 100***

Multiples

Multiples are found by multiplying the number and another whole number. For example: The multiples of 5 are 5, 10, 15, 20, 25, etc.

What are the first five multiples of 4? ***4, 8, 12, 16, 20 (must be 5)***

What are the first five multiples of 6? ***6, 12, 18, 24, 30***

Which of the numbers listed below are multiples of 7?

70, 96, 55, 28, 100 ***70, 28***

Which of the numbers listed below are multiples of 3?

Hint: Add the digits in the number together. If the sum of the digits is divisible by 3, then the whole number is divisible by 3. Therefore, the number is a multiple of 3.

25, 21, 24, 26, 28, 27 ***21, 24, 27***

List the first six multiples of 7 ***7, 14, 21, 28, 35, 42***

List the first six multiples of 9 ***9, 18, 27, 36, 45, 54***

Prime Numbers and Composite Numbers

A **prime number** is a whole number that is greater than 1 and has only two factors, the number 1, and itself. It is the opposite of a composite number.

Example: 5 is a prime number: it has two factors, 5 and 1.

A **composite number** is a whole number that is greater than 1 and has more than two factors. It is the opposite of a prime number.

Example: 8 is a composite number; it has 4 factors, 1, 2, 4, and 8.
(1 x 8 = 8 and 2 x 4 = 8)
Example: 12 is a composite number: it has 6 factors, 1, 2, 3, 4, 6 and 12
(1 x 12 = 12 and 3 x 4 = 12 and 2 x 6 = 12)

1. For each number write **P** if it is prime, **C** if it is a composite number.

a. 8 ***C*** b. 9 ***C*** c. 3 ***P*** d. 7 ***P*** e. 5 ***P*** f. 12 ***C*** g. 16 ***C***

h. 19 ***P*** i. 32 ***C*** j. 11 ***P*** k. 14 ***C*** l. 6 ***C*** m. 9 ***C*** n. 13 ***P***

Hint: The only even number that is a prime number is 2, the rest are composite numbers.

2. Tell whether each underlined number is an example of a prime number or a composite number.

   Write **P** for prime and **C** for composite.

   a. $\underline{9} \times 5 = 45$ ***C*** b. $5 \times 1 = \underline{5}$ ***P*** c. $2 \times 3 = \underline{6}$ ***C*** d. $5 \times 7 = \underline{35}$ ***C***

   e. $\underline{3} \times 6 = 18$ ***P*** f. $4 \times 4 = \underline{16}$ ***C*** g. $6 \times 7 = \underline{42}$ ***C*** h. $1 \times 2 = \underline{2}$ ***P***

3. Are there more *odd* prime numbers or more *even* prime numbers. Explain your answer.

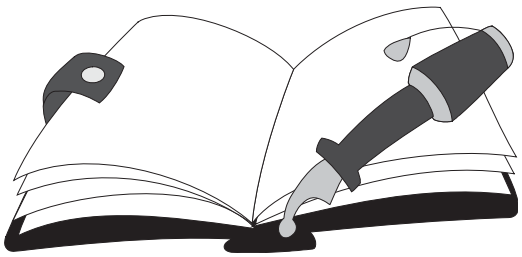
   More odd numbers are prime. Even numbers greater than 2 are all divisible by 2 and, therefore, are composite numbers.

4. How many factors can you find for the number 36? Show your work.

   1 and 36 6 and 6 2 and 18 3 and 12 4 and 9

   1, 2, 3, 4, 6, 9, 12, 18, 36 There are 9 factors

   $(1 \times 36 = 36, 2 \times 18 = 36, 3 \times 12 = 36, 4 \times 9 = 36, 6 \times 6 = 36)$



Number Factors

Factors are the numbers that are multiplied in a multiplication expression.

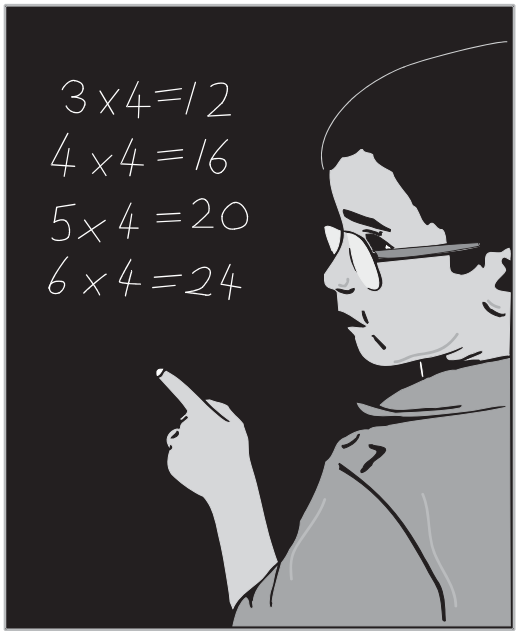
$4 \times 7 = 28$ (**Both 4 and 7 are factors.**) (**28 is the product.**)

How can you tell if 9 is a factor of 36? Divide! Because $36 \div 9 = 4$ and 4 is a whole number, we know that 9 is a factor of 36.

Show whether each of the following are factors by writing *yes* or *no* in the blanks provided.

Number	Factor	Yes or No
16	7	***No***
81	9	***Yes***
46	2	***Yes***
44	8	***No***
31	3	***No***

Number	Factor	Yes or No
35	5	***Yes***
24	9	***No***
52	4	***Yes***
55	11	***Yes***
19	2	***No***



Factor Trees

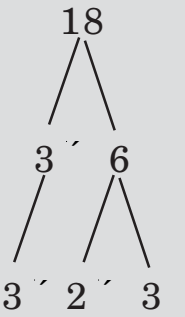
Factor trees are useful for showing all factors as prime numbers.

A factor tree will help you find how many prime factors a number has.

How many prime factors does the number 18 have?

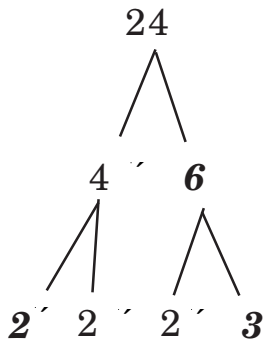
1. Choose two factors that can be multiplied together to make 18. For example: 3 × 6
2. Because 3 is a prime number, we just move the 3 down. 6 is not a prime number, so we need to break it into factors.
3. Write the prime number factors in an equation.

   Example: 18 = 3 × 2 × 3

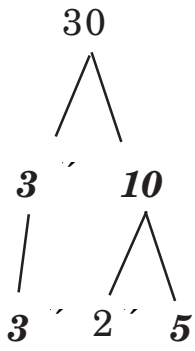


So 18 = 3 × 2 × 3
all prime numbers

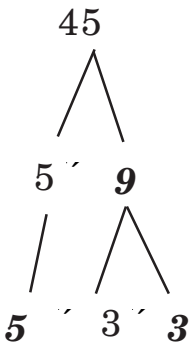
Find the missing factors. Beneath each factor tree write the prime number factors in an equation.



24 = 2 × 2 × 2 × 3

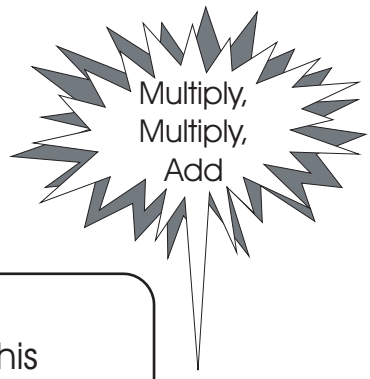


30 = 3 × 2 × 5



45 = 5 × 3 × 3

3-Digit by 2-Digit Multiplication



Example: 32 ´ 27

1. Multiply (32 ´ 7)

$$\begin{array}{r} \mathbf{32} \\ \times\ \mathbf{27} \\ \hline 224 \end{array}$$

2. Multiply (32 ´ 20)

$$\begin{array}{r} \mathbf{32} \\ \times\ \mathbf{27} \\ \hline 224 \\ \mathbf{640} \end{array}$$

The first digit on this line will always be a zero.

3. Add (224 + 640)

$$\begin{array}{r} 32 \\ \times\ 27 \\ \hline 224 \\ +\ 640 \\ \hline \mathbf{864} \end{array}$$

The answer is 864!

Try the following questions. Show all your work!

1. $\begin{array}{r} 34 \\ \times\ 24 \\ \hline 136 \\ +\ 680 \\ \hline 816 \end{array}$

2. $\begin{array}{r} 84 \\ \times\ 12 \\ \hline 168 \\ +\ 840 \\ \hline 1008 \end{array}$

3. $\begin{array}{r} 22 \\ \times\ 57 \\ \hline 154 \\ +1100 \\ \hline 1254 \end{array}$

4. $\begin{array}{r} 26 \\ \times\ 35 \\ \hline 130 \\ +\ 780 \\ \hline 910 \end{array}$

5. $\begin{array}{r} 14 \\ \times\ 46 \\ \hline 84 \\ +560 \\ \hline 644 \end{array}$

6. $\begin{array}{r} 38 \\ \times\ 16 \\ \hline 228 \\ +380 \\ \hline 608 \end{array}$

7. $\begin{array}{r} 22 \\ \times\ 46 \\ \hline 132 \\ +880 \\ \hline 1012 \end{array}$

8. $\begin{array}{r} 11 \\ \times\ 29 \\ \hline 99 \\ +220 \\ \hline 319 \end{array}$

9. $\begin{array}{r} 24 \\ \times\ 27 \\ \hline 168 \\ +480 \\ \hline 648 \end{array}$

10. $\begin{array}{r} 55 \\ \times\ 48 \\ \hline 440 \\ +2200 \\ \hline 2640 \end{array}$

11. $\begin{array}{r} 65 \\ \times\ 10 \\ \hline 00 \\ +650 \\ \hline 650 \end{array}$

12. $\begin{array}{r} 34 \\ \times\ 17 \\ \hline 238 \\ +340 \\ \hline 578 \end{array}$

13. $\begin{array}{r} 52 \\ \times\ 30 \\ \hline 00 \\ +1560 \\ \hline 1560 \end{array}$

14. $\begin{array}{r} 27 \\ \times\ 27 \\ \hline 189 \\ +540 \\ \hline 729 \end{array}$

15. $\begin{array}{r} 21 \\ \times\ 74 \\ \hline 84 \\ +1470 \\ \hline 1554 \end{array}$

Multiplication with Decimals

Multiplying with decimals is easy. It just requires one extra step.

1. Multiply
2. Multiply
3. Add
4. Count!

$$\begin{array}{r} 6.409 \\ \times\ 7.8 \\ \hline 51272 \\ +448630 \\ \hline 49.9902 \end{array}$$

3 decimal places from the right.

1 decimal place from the right.

Because there are 4 decimal places in the question, you need 4 decimal places in the answer.

Start on the right of the answer and move 4 places to the left then enter the decimal.

Rewrite the answers and show the decimal for the following.

1. $3.2 \times 1.2 = 384$ ***3.84***
2. $2.29 \times 1.5 = 3435$ ***3.435***
3. $8.9 \times 0.98 = 8722$ ***8.722***
4. $0.074 \times 5.5 = 04070$ ***.407***
5. $144.8 \times 0.9 = 13032$ ***130.32***
6. $3008.7 \times 1.64 = 4934268$ ***4934.268***
7. $290.6 \times 5.14 = 1493684$ ***1493.684***
8. $27.3 \times 1.5 = 4095$ ***40.95***

Find the answer to each of the following questions.

1. $\begin{array}{r} 2.3 \\ \times 5.4 \\ \hline 92 \\ +1150 \\ \hline 12.42 \end{array}$

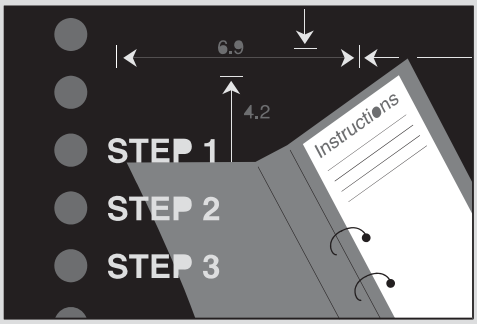
2. $\begin{array}{r} 8.1 \\ \times\ 2.8 \\ \hline 648 \\ +1620 \\ \hline 22.68 \end{array}$

3. $\begin{array}{r} 3.7 \\ \times\ 4.5 \\ \hline 185 \\ +1480 \\ \hline 16.65 \end{array}$

4. $\begin{array}{r} 2.1 \\ \times\ 8.4 \\ \hline 84 \\ +1680 \\ \hline 17.64 \end{array}$

3-Step Problem-Solving Process

1. Write the problem in a number question.
2. Solve the problem. **Show your work.**
3. Write a sentence with the answer.



Tiny Town has one movie theatre. Each movie plays for 12 nights. If an average of 23 people go to every showing, how many people are expected to see the movie?

$$\begin{array}{r} 12 \\ \times\ 23 \\ \hline 36 \\ +240 \\ \hline 276 \end{array}$$

276 people are expected to see the movie.

The Tiny Town theatre sells popcorn for $2.75. If 15 people buy the popcorn, how much money will the theatre make if the profit on every bag of popcorn is $2.25?

$$\begin{array}{r} \$2.25 \\ \times\ 15 \\ \hline 1125 \\ +2250 \\ \hline \$33.75 \end{array}$$

$33.75 is the profit for 15 bags of popcorn.

The Tiny Town theatre has 21 rows of seats with 14 seats per row. How many seats are in the theatre?

```
  21
× 14
  84
+210
 294
```

There are 294 seats in the theatre.

Mark goes to the Tiny Town theatre two times a week through the summer holidays. If Mark spends $7.50 per week for 8 weeks, how much money will Mark spend?

```
 $7.50
×    8
$60.00
```

Mark will spend $60.00.