

# Lesson 1 The Multiplication Table of 3

## Objectives

- Build and understand the structure of the multiplication table of 3.
- Look for patterns in the multiplication table of 3.

## Lesson Materials

- Counters, 30 per student
- Multiplication Chart 9–1 (BLM)
- Array Dot Cards – 3 (BLM)

## Think

Pose the **Think** problem. Ask students what they have learned this year that might help them with this problem.

Have students use counters and share how they solved the problem.

As in the **Dimensions Math® 2A** lessons for multiplication by 2, 5, and 10, students will build and record the multiplication table for 3.

Have students start by making one row of counters and filling in Multiplication Chart 9–1 (BLM):

- 1 package, 3 glue sticks in each package, total number of glue sticks. The product column should be left blank.

Have students add a second row of 3 counters to see how many glue sticks there are in 2 packages.

Continue to add rows and complete the chart. Reinforce the term **array** when laying out the rows.

Discuss Mei's thought on the increasing total.

Ask students:

- How is this problem different from the problems in **Dimensions Math® 2A** when we counted mangoes by fives, watermelons by twos, and walnuts by tens? (We are multiplying 3, or by 3.)
- How is it the same? (We are still making equal groups.)

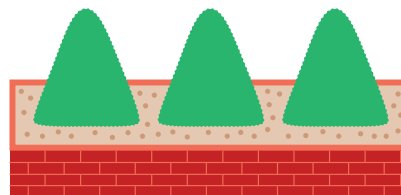
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## Lesson 1 The Multiplication Table of 3

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### Think

There are 3 trees in each planter.



$$1 \times 3 = \square$$

How many trees are there in  $\square$  planters?

$$\square \times 3 = ?$$

How many trees are there in  $\square$  planters?

Find the number of trees if there are ...

$\square$  3,  $\square$  4,  $\square$  5,  $\square$  6,  $\square$  7,  $\square$  8,  $\square$  9, and  $\square$  10 planters.



How does the total number of trees change when the number of planters increases by 1?

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## Learn

Have students add the equations to their Multiplication Chart 9–1 (BLM).

Students should notice that as the number of groups increases by 1, the product increases by 3. If students know  $3 \times 3$ , they can find  $4 \times 3$  by simply adding 3, rather than counting by threes from the start.

Students should also notice that  $9 \times 3$  is the same as  $10 \times 3 - 3$ , or  $30 - 3$ .











Discuss Alex's comments. Students will be introduced to factors, or multiples, in **Dimensions Math® 4A**.

At this point, accept any reasonable answer.

When you add the digits of the sum of the products of 3, the sums:

- Create a pattern: 3, 6, 9, 3, 6, 9...
- Are also multiples of 3.

**Learn**

$1 \times 3 = 3$		
$2 \times 3 = 6$		
$3 \times 3 = 9$		$3 \times 3$ is 3 more than $2 \times 3$ .
$4 \times 3 = 12$		$4 \times 3$ is 3 less than $5 \times 3$ .
$5 \times 3 = 15$		
$6 \times 3 = 18$		
$7 \times 3 = 21$		$7 \times 3$ is 3 more than $6 \times 3$ .
$8 \times 3 = 24$		
$9 \times 3 = 27$		$9 \times 3$ is 3 less than $10 \times 3$ .
$10 \times 3 = 30$		

Look at the products.  
If you add the digit in the ones place to the digit in the tens place, what do you notice about the sums?

12:  $1 + 2 = 3$ ,  
15:  $1 + 5 = 6$ ,  
18:  $1 + 8 = 9$ ,  
21:  $2 + 1 = 3$ ,  
...



## Do

- Students may notice the pattern that 4 is double 2, so  $4 \times 3$  is double  $2 \times 3$ .
- Do the activity below and have students create their own dot cards. Alternatively, students can use Array Dot Cards – 3 (BLM) in dry erase sleeves for the problems.

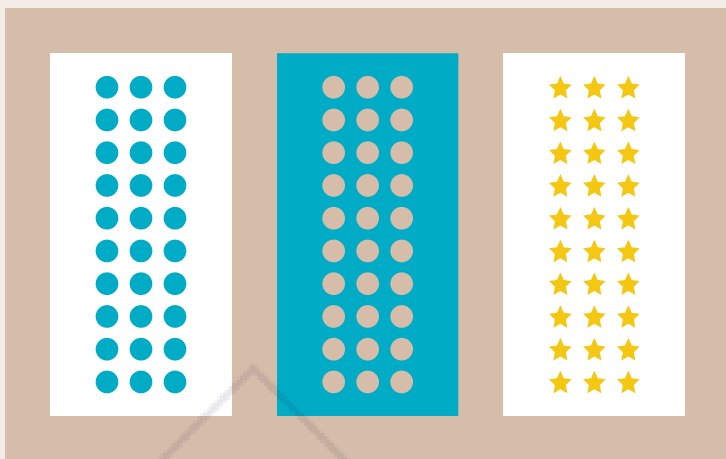
## Activity

### ▲ Array Dot Cards — 3

**Materials:** Index cards, craft punches/hole punches or dot stickers, glue

Have each student fold a piece of paper into 8 parts then cut along the lines to create 8 cards.

Have each student use either dot stickers or punches to make a  $3 \times 10$  array on index cards for future reference. Students will make similar cards for  $\times 4$ .



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**Do**

- Count by 3s to 30.
- (a)  $2 \times 3 = 6$  (b)  $4 \times 3 = 12$
- Use array dot cards to find the totals.
 

(a) $5 \times 3 = 15$	(b) $10 \times 3 = 30$
$6 \times 3 = 18$	$9 \times 3 = 27$
$7 \times 3 = 21$	$8 \times 3 = 24$
- How much do 9 bags of balloons cost?
 

$9 \times 3 = 27$
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 9 bags cost \$  $27$ .

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# Lesson 2 Multiplication Facts of 3

## Objectives

- Understand the commutative property in the multiplication table of 3.
- Learn the multiplication facts of 3.

## Lesson Materials

- Counters
- Construction paper or index cards, 20 per student

## Think

Pose the **Think** problem. At this point, most students will know that there are 12 rolls. Students may mention that the rolls are arranged in an array.

Have students model the problem with counters and share how they solved the problem.

## Learn

Dion reminds us that the order in which we multiply will not change the total. Whether it is 3 groups of 5 or 5 groups of 3, the total is the same.

While learning the facts, the commutative property is very valuable. When students learn  $3 \times 6$ , they know the answer will be the same as for  $6 \times 3$ , which they have already learned. Thus, they know some facts for groups of 6 before they count by sixes.

This means there are fewer and fewer facts that need to be learned in each successive table.

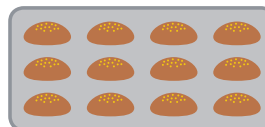
This part of the lesson may progress quickly.

Students will need time in the **Do** part of the lesson to create flash cards.

## Lesson 2 Multiplication Facts of 3

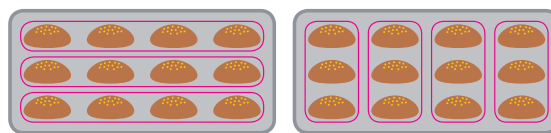
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### Think



How can we use multiplication to find the total number of rolls?

### Learn



$$4 + 4 + 4 = 12 \quad | \quad 3 \times 4 = 12 \quad | \quad 3 + 3 + 3 + 3 = 12 \quad | \quad 4 \times 3 = 12$$



$$3 \times 4 = 4 \times 3$$

We can use rows or columns.



There are 12 rolls altogether.

## Do

- 1—2 Emphasize that it does not matter which number comes first, the number of groups or the number in each group, the answer is the same. The numbers can be multiplied in any order to get an answer.
- 3 Students should see that 3 grams  $\times$  6 is equal to 6 grams  $\times$  3.
- 5 Provide students with index cards and have them create their own flash cards for future practice and games.

Students can also fold construction paper into 8 equal parts and cut out their own flash cards.

## Activities

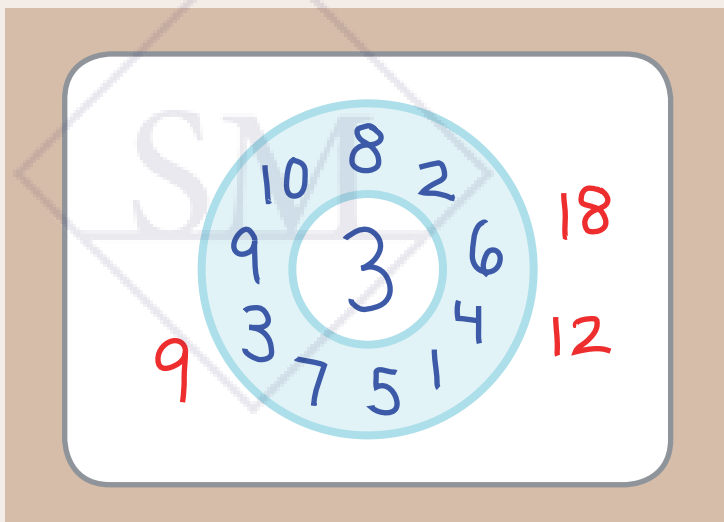
### ▲ Multiplication Wheels

**Materials:** Paper plates with the center cut out

Create several multiplication wheels with the numbers 1 to 10 in random order as “spokes” along the edge of the paper plates.

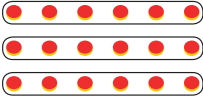
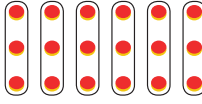
Students lay the wheel on a whiteboard and write the number they are multiplying by in the center of the wheel. (In this lesson it is 3.)

Students multiply the number on the spoke and the number in the center, and write the product on the whiteboard, outside of the wheel.



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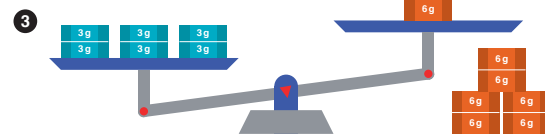
## Do

1  

$6 + 6 + 6 = 18$        $3 + 3 + 3 + 3 + 3 + 3 = 18$

$3 \times 6 = 18$        $6 \times 3 = 18$

- 2 (a)  $2 \times 3 = 3 \times 2$       (b)  $7 \times 3 = 3 \times 7$
- (c)  $9 \times 3 = 3 \times 9$       (d)  $5 \times 3 = 3 \times 5$



How many more of the 6-gram weights do we need to make the scale balance?  
2 more of the 6-gram weights

- 4 Sophia's jacket has 3 rows of 3 pins.

$3 \times 3 = 9$

There are 9 pins.



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- 5 What is the value of each?

$1 \times 3$	$3 \times 1$	3
$2 \times 3$	$3 \times 2$	6
$3 \times 3$	$3 \times 3$	9
$4 \times 3$	$3 \times 4$	12
$5 \times 3$	$3 \times 5$	15
$6 \times 3$	$3 \times 6$	18
$7 \times 3$	$3 \times 7$	21
$8 \times 3$	$3 \times 8$	24
$9 \times 3$	$3 \times 9$	27
$10 \times 3$	$3 \times 10$	30

Make flash cards and practice the multiplication facts of 3.

$3 \times 8 = 24$

Which facts did you already learn from the multiplication facts of 2, 5, and 10?

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9-2 Multiplication Facts of 3

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### ▲ Three's a Hopping!

**Materials:** Sidewalk chalk or painter's tape, multiplication by 3 cards made in this lesson

Create two grids like the one shown below, using either chalk outside or painter's tape inside.

3	12	27
18	6	9
24	15	21
30	17	Home

One student is the Caller. Two students are the Hoppers, and stand on their home squares. The Caller flips over a multiplication by 3 card and calls out the equation.

Hoppers must hop on the answer.

The first Hopper who misses the correct square becomes the next Caller. (Include a non-multiple of 3 in the extra square.)

### ▲ Three's a Bopping!

**Materials:** Paper, markers or crayons, fly swatters or bean bags, multiplication by 3 cards made in this lesson

Create two grids on paper like the one shown above to play a smaller version of **Three's a Hopping** inside.

In this version, players either smack the numbers with a fly swatter or toss a bean bag onto the answer.







## Do

- 1 Have students discuss the different situations, and then show the two situations with a drawing.  
In (a) there are 3 groups, however, in (b) there are groups of 3.
- 3 Have students share a related multiplication equation.

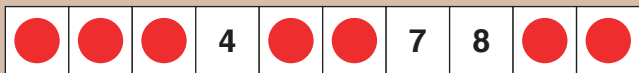
## Activities

### ▲ Clear the Board Division

**Materials:** Division by 3 Fact Cards (BLM), Individual Number Path (BLM), and 7 counters for each player

Give each student an Individual Number Path (BLM), and have them put counters on 7 of the numbers.

Players take turns drawing Division by 3 Fact Cards (BLM). If the answer to the card a player draws is one of the numbers covered on her Individual Number Path (BLM), she removes the counter from that number. The first player to clear all of her counters is the winner.



### ▲ Divide by 3 Kaboom

**Materials:** Kaboom Cards (BLM), several sets of Division by 3 Fact Cards (BLM)

Shuffle and place the Division by 3 Fact Cards (BLM) facedown in a pile. Players take turns drawing a card and saying the answer to the division fact.

They keep the cards they answer correctly, and return the cards they answer incorrectly back to the pile.

When a student draws a Kaboom Card (BLM), he must return all his collected cards to the pile.

The player with the most cards at the end of the time limit is the winner.

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## Do

- 1 (a) Divide 18 counters into 3 equal groups.

$$18 \div 3 = 6$$

There are 6 counters in each group.

$$3 \times ? = 18$$



- (b) Divide 18 counters into groups of 3.

$$18 \div 3 = 6$$

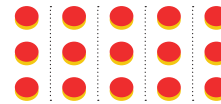
There are 6 groups.

$$? \times 3 = 18$$



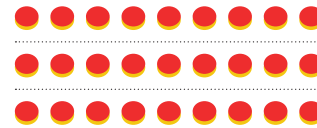
- 2 (a)  $5 \times 3 = 15$

$$15 \div 3 = 5$$



- (b)  $3 \times 9 = 27$

$$27 \div 3 = 9$$



- 3 Find the value.

(a)  $21 \div 3 = 7$

(b)  $12 \div 3 = 4$

(c)  $6 \div 3 = 2$

(d)  $30 \div 3 = 10$

(e)  $9 \div 3 = 3$

(f)  $24 \div 3 = 8$

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9-3 Dividing by 3

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