

## Using Doubling to Multiply

**Goal** Use repeated addition and doubling to multiply.

1. a)  $3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = \underline{24}$

b) Skip count by 3s to 24.

3, 6, 9, 12, 15, 18, 21, 24

c) How many 3s did you count? 8

d) How much is  $8 \times 3$ ? 24

e) How much is  $8 \times 6$ ? 48

**At-Home Help**

$10 + 10 + 10 + 10 + 10$  is **repeated addition**.

$10 + 10 + 10 + 10 + 10 = 5 \times 10$

10, 20, 30, 40, 50 is **skip counting**.

$10 + 10$  and  $2 \times 10$  show **doubling**.

2. Find each product.

a)  $2 \times 8 = \underline{16}$     c)  $5 \times 7 = \underline{35}$     e)  $3 \times 6 = \underline{18}$

b)  $4 \times 8 = \underline{32}$     d)  $10 \times 7 = \underline{70}$     f)  $6 \times 6 = \underline{36}$

3. Write a multiplication equation.

a)  $8 + 8 + 8 + 8 + 8 = \underline{40}$      $5 \times 8 = 40$

b) four 7s  $= \underline{28}$      $4 \times 7 = 28$

c)  $9 + 9 + 9 = \underline{27}$      $3 \times 9 = 27$

d) five 4s  $= \underline{20}$      $5 \times 4 = 20$

4. Use any strategy to find each product.

a)  $3 \times 4 = \underline{12}$     c)  $2 \times 9 = \underline{18}$

b)  $6 \times 4 = \underline{24}$     d)  $4 \times 9 = \underline{36}$

5. a) How many days are in 1 week? 7

b) How many full weeks of summer holidays do you have? For example, 9.

c) How many days is the number of weeks in part b)?

For example, for number of weeks in part b), 63.

# Sharing and Grouping

**Goal**

Use 2 meanings for division to solve problems.

1. Circle the correct answer.

$\ddot{\cdot}$   $\ddot{\cdot}$   $\ddot{\cdot}$  shows

**A.**  $12 \div 4 = 3$

**C.**  $16 \div 2 = 8$

**B.**  $16 \div 4 = 4$

**D.**  $16 \div 8 = 2$

2. Write and solve the division equation.

- a)** There are 36 bottles with 6 bottles in each box.  
How many boxes are there?

$$36 \div 6 = 6$$

- b)** There are 27 plants with 3 plants in each pot.  
How many pots are there?

$$27 \div 3 = 9$$

- c)** 8 students share 32 pieces of paper equally.  
How many pieces does each student get?

$$32 \div 8 = 4$$

3. Complete each division equation.

**a)**  $14 \div 7 = \underline{2}$       **c)**  $21 \div 3 = \underline{7}$       **e)**  $24 \div 3 = \underline{8}$

**b)**  $35 \div 5 = \underline{7}$       **d)**  $48 \div 6 = \underline{8}$       **f)**  $45 \div 9 = \underline{5}$

4. There are 24 cookies in a box.

Each person gets the same number of cookies.

Each person gets at least 3 cookies.

What is the greatest number of people that can share the cookies?

8 people

**At-Home Help**

Division can have 2 meanings.

**Sharing**

When you know the number of groups, you can find how many are in each group's share.

24 books to be shared among 6 groups:

$$24 \div 6 = 4$$

There are 4 books for each group.

**Grouping**

When you know each group's share, you can find the number of groups.

24 books with 4 books to a group:

$$24 \div 4 = 6$$

6 groups get books.

# Division and Multiplication

## Goal Relate multiplication to division.

1. Complete each division equation.

Then write a related multiplication equation.

a)  $12 \div 3 = \underline{4}$        $\underline{4} \times \underline{3} = \underline{12}$

b)  $21 \div 7 = \underline{3}$        $\underline{3} \times \underline{7} = \underline{21}$

c)  $32 \div 8 = \underline{4}$        $\underline{4} \times \underline{8} = \underline{32}$

d)  $27 \div 3 = \underline{9}$        $\underline{9} \times \underline{3} = \underline{27}$

2. Complete each multiplication equation.

Then write a related division equation.

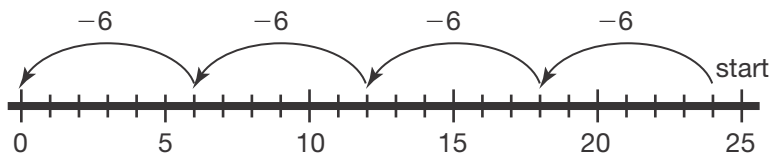
a)  $4 \times 5 = \underline{20}$        $\underline{20} \div \underline{5} = \underline{4}$

b)  $3 \times 8 = \underline{24}$        $\underline{24} \div \underline{8} = \underline{3}$

c)  $6 \times 6 = \underline{36}$        $\underline{36} \div \underline{6} = \underline{6}$

d)  $4 \times 7 = \underline{28}$        $\underline{28} \div \underline{7} = \underline{4}$

3. a) Write a division equation for the number line.  $\underline{24 \div 6 = 4}$



- b) Write a related multiplication equation.  $\underline{6 \times 4 = 24}$

4. \$12 is shared equally among 4 children. How much money does each child receive? Check your answer by multiplying.

\$3

$3 \times 4 = 12$

5. Sal earned \$25 for working 5 hours. Joe earned \$16 for working 4 hours. Who earned the most in an hour? Check your answer by multiplying.

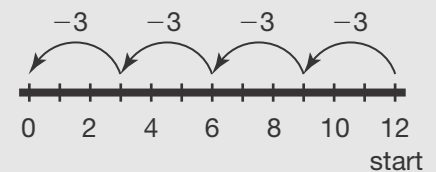
Sal earned the most.

$5 \times 5 = 25$        $4 \times 4 = 16$

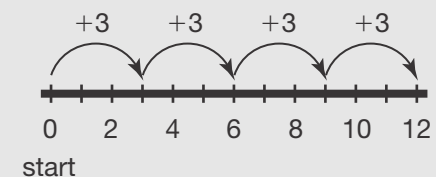
### At-Home Help

Multiplication and division are related. Multiplication can be used to check division.

$12 \div 4 = 3$



$4 \times 3 = 12$



# Arrays for Fact Families

**Goal** Describe arrays using fact families.

1. Write the fact family for each array.

a)  $\begin{array}{cccc} X & X & X & X \\ X & X & X & X \\ X & X & X & X \end{array}$   $\frac{4}{12} \times \frac{3}{3} = \frac{12}{12}$   
 $\frac{3}{12} \times \frac{4}{4} = \frac{12}{12}$   
 $\frac{12}{12} \div \frac{4}{3} = \frac{3}{4}$   
 $\frac{12}{12} \div \frac{3}{4} = \frac{4}{3}$

b)  $\begin{array}{cccccc} X & X & X & X & X & X \\ X & X & X & X & X & X \\ X & X & X & X & X & X \end{array}$   $3 \times 6 = 18$   
 $6 \times 3 = 18$   
 $18 \div 3 = 6$   
 $18 \div 6 = 3$

c)  $\begin{array}{cccccc} X & X & X & X & X & \\ X & X & X & X & X & \\ X & X & X & X & X & \\ X & X & X & X & X & \end{array}$   $4 \times 5 = 20$   
 $5 \times 4 = 20$   
 $20 \div 5 = 4$   
 $20 \div 4 = 5$

2. Draw an array for each multiplication.

a)  $3 \times 8$

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

24

b)  $7 \times 3$

XXX

XXX

XXX

XXX

XXX

XXX

XXX

21

3. Use the given fact to write the whole fact family.

a)  $5 \times 6 = 30$   $6 \times 5 = 30$   $30 \div 6 = 5$   $30 \div 5 = 6$

b)  $24 \div 6 = 4$   $24 \div 4 = 6$   $6 \times 4 = 24$   $4 \times 6 = 24$

4. Sometimes a fact family does not have 4 related facts.

Show an example. Answers will vary. For example:

$4 \times 4 = 16$

$16 \div 4 = 4$

## At-Home Help

2 multiplication facts and 2 division facts that describe the same array are a **fact family**.

X X X X

X X X X

$2 \times 4 = 8$

$8 \div 2 = 4$

$4 \times 2 = 8$

$8 \div 4 = 2$

# Using Facts to Multiply Larger Numbers

**Goal** Use basic facts, patterns, and mental math to multiply.

1. Find the products.

a)  $3 \times 3 = \underline{9}$

g)  $4 \times 5 = \underline{20}$

b)  $3 \times 30 = \underline{90}$

h)  $4 \times 50 = \underline{200}$

c)  $3 \times 300 = \underline{900}$

i)  $4 \times 500 = \underline{2000}$

d)  $4 \times 8 = \underline{32}$

j)  $6 \times 3 = \underline{18}$

e)  $4 \times 80 = \underline{320}$

k)  $6 \times 30 = \underline{180}$

f)  $4 \times 800 = \underline{3200}$

l)  $6 \times 300 = \underline{1800}$

2. Find the products.

a)  $2 \times 40 = \underline{80}$

d)  $3 \times 600 = \underline{1800}$

b)  $4 \times 20 = \underline{80}$

e)  $5 \times 8000 = \underline{40000}$

c)  $3 \times 700 = \underline{2100}$

f)  $7 \times 3000 = \underline{21000}$

3. Circle the correct answer.

a)  $6 \times 40 =$

A. 2400

B. 24

**C. 240**

D. 100

b)  $7 \times 500 =$

**E. 3500**

F. 35 000

G. 1200

H. 350

c)  $5 \times 9000 =$

A. 450

B. 14 000

**C. 45 000**

D. 4500

4. a) How many cans are in 50 boxes? Show your work.

300 cans

b) How many paper clips are in 7 boxes? Show your work.

2100 paper clips

## At-Home Help

To find the product of large numbers, use basic facts, patterns in multiplying by 10 and 100, and mental math.

$$3 \times 40 = 120$$

Think:

$3 \times 4$  tens  
 = 12 tens  
 = 1 hundred 2 tens  
 = 120

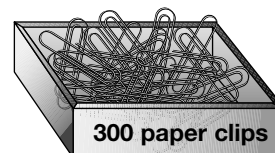
$$3 \times 400 = 1200$$

Think:

$3 \times 4$  hundreds  
 = 12 hundreds  
 = 1 thousand 2 hundreds  
 = 1200



6 cans



300 paper clips

# Solve Problems by Making Models

**Goal** Make models to solve problems.

You will need 20 toothpicks, 20 buttons, or any 20 small objects of the same kind.

Make a model to answer each question.  
Then draw a picture to record your work.

1. Show all the possible arrays for 10 cars.

```

XXXXXXXXXX      X X X X X
                  X X X X X
  
```

2. Show all the possible arrays for 20 cars.

```

XXXXXXXXXXXXXXXXXXXXXXXX

X X X X X X X X X X X X X X X X X
X X X X X X X X X X X X X X X X X
                                X X X X X
                                X X X X X
                                X X X X X
  
```

3. 2 out of every 6 cars are new cars.  
Out of 18 cars, how many cars are new?

```

X X X X X X      X X X X X X      X X X X X X
  
```

6 out of 18 cars are new.

4. Amy had toy cars. She gave away her toy cars to Matt, Shani, and Vinh.  
They got 5 cars each. How many toy cars did Amy have?

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XXXXX      XXXXX      XXXXX
  Matt      Shani      Vinh
  
```

Amy had 15 cars.

## At-Home Help

Making a model can help you to solve a problem.

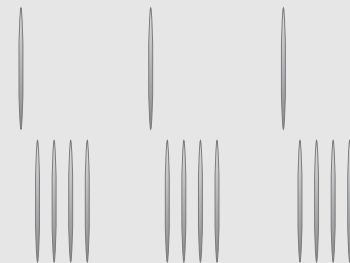
1 out of every 5 cars is a 2-door model. Out of 15 cars, how many are 2-door models?

You can use 15 toothpicks to model 15 cars.

Make groups of 5.



Then select 1 toothpick from each group.



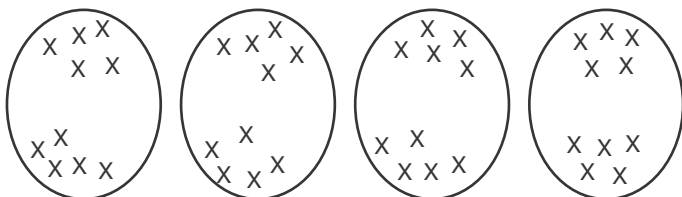
So 3 out of 15 cars are 2-door models.

# Halving Strategies: Facts with 5 and 10

**Goal**

Find patterns in multiplication and division facts with 5 and 10.

1. Show how 8 groups of 5 is the same as 4 groups of 10.


**At-Home Help**

You can use the **halve and double** strategy find another fact using an easier fact.

$6 \times 5 = 30$  is the same as  $3 \times 10 = 30$  because 3 is half of 6 and 10 is double 5.

2. Complete this Halve and Double table.

Multiply an even number by 5	Halve the even number and multiply by 10	Product
$2 \times 5$	$1 \times 10$	10
$4 \times 5$	$2 \times 10$	20
$6 \times 5$	$3 \times 10$	30
$8 \times 5$	$4 \times 10$	40
$10 \times 5$	$5 \times 10$	50
$12 \times 5$	$6 \times 10$	60
$14 \times 5$	$7 \times 10$	70
$16 \times 5$	$8 \times 10$	80
$18 \times 5$	$9 \times 10$	90

3. How could you use the table in Question 2 to find  $7 \times 5$ ?

For example, 7 is halfway between 6 and 8, so  $7 \times 5$  will be halfway

between 30 and 40, or 35.

4. Complete.

a)  $6 \times 5 = \underline{30}$       d)  $5 \times 80 = \underline{400}$       g)  $20 \div 10 = \underline{2}$   
 b)  $6 \times 50 = \underline{300}$       e)  $5 \times 800 = \underline{4000}$       h)  $20 \div 5 = \underline{4}$   
 c)  $6 \times 500 = \underline{3000}$       f)  $5 \times 8000 = \underline{40000}$

# Adding On: Facts with 3 and 6

**Goal** Use addition strategies to multiply and divide with 3 and 6.

1. Answer only the questions that are 3 or 6 facts.

### At-Home Help

Facts you know can help you to find facts you don't know.

If you know  $3 \times 6 = 18$ ,  
then  $3 \times 7 = 18 + 3$   
 $= 21$

Counting on from a fact you know is a useful strategy to find a fact you can't remember.

$$3 \times 3 = \underline{9}$$

$$8 \times 9 = \underline{\quad}$$

$$7 \times 0 = \underline{\quad}$$

$$6 \times 7 = \underline{42}$$

$$3 \times 7 = \underline{21}$$

$$21 \div 3 = \underline{7}$$

$$6 \times 5 = \underline{30}$$

$$5 \times 7 = \underline{\quad}$$

$$3 \times 8 = \underline{24}$$

$$4 \times 9 = \underline{\quad}$$

$$42 \div 6 = \underline{7}$$

$$18 \div 3 = \underline{6}$$

$$12 \div 3 = \underline{4}$$

$$6 \times 6 = \underline{36}$$

$$2 \times 8 = \underline{\quad}$$

$$4 \times 5 = \underline{\quad}$$

$$4 \times 3 = \underline{12}$$

$$3 \times 6 = \underline{18}$$

$$30 \div 6 = \underline{5}$$

Count the number of questions you answered.

If you counted 13, you answered all the questions with facts of 3 or 6.

2. a) What is the greatest answer you found? 42  
 b) Write a fact of 6 with an answer that is greater.  $6 \times 8 = 48$  or  $6 \times 9 = 54$
3. a) What is the least answer you found? 4  
 b) Write a division by 3 fact with an answer that is less.  $9 \div 3 = 3$ ,  $6 \div 3 = 2$ ,  
 or  $3 \div 3 = 1$



# Subtracting Strategy: Facts with 9

**Goal** Use counting patterns to multiply and divide with 9.

1. Complete the table.

Fact of 9	Fact of 10	Subtraction
$1 \times 9$	$1 \times 10 = 10$	$10 - 1 = 9$
$2 \times 9$	$2 \times 10 = \underline{20}$	$20 - 2 = \underline{18}$
$3 \times 9$	$3 \times 10 = 30$	$30 - 3 = 27$
$4 \times 9$	$4 \times 10 = 40$	$40 - 4 = 36$
$5 \times 9$	$5 \times 10 = 50$	$50 - 5 = 45$
$6 \times 9$	$6 \times 10 = 60$	$60 - 6 = 54$
$7 \times 9$	$7 \times 10 = 70$	$70 - 7 = 63$
$8 \times 9$	$8 \times 10 = 80$	$80 - 8 = 72$

## At-Home Help

To multiply by 9, multiply the number by 10 and then subtract the number.

For example,  $5 \times 9$  is the same as  $5 \times 10 - 5$ .

2. Use the subtraction strategy to find each product.

a)  $4 \times 9 = \underline{36}$       d)  $2 \times 9 = \underline{18}$       g)  $5 \times 90 = \underline{450}$

b)  $5 \times 9 = \underline{45}$       e)  $8 \times 9 = \underline{72}$       h)  $9 \times 200 = \underline{1800}$

c)  $9 \times 3 = \underline{27}$       f)  $7 \times 9 = \underline{63}$       i)  $9 \times 6000 = \underline{54\,000}$

3. Gary has 9 baseball cards. Soo has 6 times as many cards.  
How many cards does Soo have?

54 cards

4. Sara saved 3 box tops. James saved 9 times as many box tops.  
25 box tops are needed for a prize.  
Has James saved enough box tops to get a prize?

yes

# Number Neighbours: Facts with 7 and 8

**Goal**

Use facts you know to multiply and divide with 7 and 8.

1. Use the given fact to complete the other 2 facts.

a)  $8 \times 3 = 24$      $8 \times 2 = \underline{16}$      $8 \times 4 = \underline{32}$

b)  $7 \times 6 = 42$      $7 \times 5 = \underline{35}$      $7 \times 7 = \underline{49}$

c)  $8 \times 7 = 56$      $8 \times 6 = \underline{48}$      $8 \times 8 = \underline{64}$

d)  $7 \times 4 = 28$      $7 \times 3 = \underline{21}$      $7 \times 5 = \underline{35}$

e)  $8 \times 5 = 40$      $8 \times 4 = \underline{32}$      $8 \times 6 = \underline{48}$

f)  $7 \times 8 = 56$      $7 \times 7 = \underline{49}$      $7 \times 6 = \underline{42}$

**At-Home Help**

Using a fact you know and then adding or subtracting can help you to find facts you don't know.

Knowing  $7 \times 7$  helps you to find the neighbour facts,  $7 \times 8$  and  $7 \times 6$ .

$$7 \times 7 = 49$$

$$7 \times 8 = \blacksquare \quad 49 + 7 = 56$$

$$7 \times 6 = \blacksquare \quad 49 - 7 = 42$$

2. Divide.

a)  $28 \div 7 = \underline{4}$

c)  $35 \div 5 = \underline{7}$

b)  $48 \div 8 = \underline{6}$

d)  $72 \div 8 = \underline{9}$

3. Multiply.

a)  $7 \times 60 = \underline{420}$

c)  $8 \times 90 = \underline{720}$

b)  $8 \times 500 = \underline{4000}$

d)  $7 \times 400 = \underline{2800}$

4. 36 stickers are shared evenly among 9 friends.

How many stickers does each person receive?

4 stickers

5. Paulette walks 6 km each day.

How many kilometres does she walk in 1 week?

42 km

# Test Yourself

Circle the correct answer.

- There are 6 paintbrushes in each of 7 pots.  
How many paintbrushes are there altogether?  
 A. 13                      B. 1                      **C. 42**                      D. 54
- Ravi hands out 42 pieces of paper to 6 students.  
Each student gets the same amount of paper.  
How many pieces of paper does each student get?  
 E. 8                      F. 48                      G. 36                      **H. 7**
- The paint tables are arranged like this. 


  
Which equation matches this array?  
**A.  $2 \times 5 = 10$**                       B.  $5 + 2 = 10$                       C.  $10 \times 1 = 10$                       D.  $10 - 5 = 2$
- There are 600 crayons in each bin.  
How many crayons are in 5 bins?  
 E. 30                      F. 300                      **G. 3000**                      H. 1100
- Lance, Alice, and Rami painted 24 pictures.  
Each student painted the same number of pictures.  
How many pictures did each student paint?  
**A. 8**                      B. 12                      C. 27                      D. 72
- The art room has 8 tables. Each table seats 6 students.  
How many students can sit at the tables in the art room?  
 E. 14                      **F. 48**                      G. 54                      H. 2
- 6 tables seat 6 students each.  
How many students will there be if 7 tables are filled?  
 A. 36                      **B. 42**                      C. 30                      D. 19
- A group of 8 students made 72 decorations.  
Each student made the same number of decorations.  
How many decorations did each student make?  
**E. 9**                      F. 8                      G. 10                      H. 80