

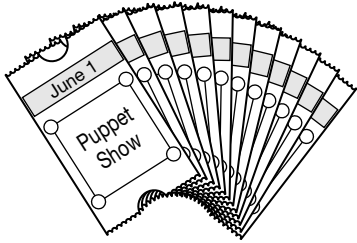
# Sharing to Divide

**Goal**

Use words and symbols to describe division by sharing.

You will need buttons, bread tags, toothpicks, or other small items to use as counters.

1. 12 tickets are shared equally by 3 winners.



- a) Model the problem with counters.  
Draw a picture of your finished model.



- b) Write a division sentence.  $\frac{12}{3} = \frac{4}{1}$

Read the sentence as  $\frac{12}{3}$  shared equally by  $\frac{3}{1}$  is  $\frac{4}{1}$  for each.

- c) Write a multiplication fact for your model.  $3 \times 4 = 12$

2. Model each situation. Draw a picture of your model.  
Write a division sentence for each.

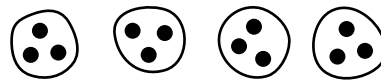
- a) 6 tickets shared equally by 3 winners

$$\frac{6}{3} = \frac{2}{1}$$



- b) 12 tickets shared equally by 4 winners

$$\frac{12}{4} = \frac{3}{1}$$



- c) 4 divided by 4

$$\frac{4}{4} = \frac{1}{1}$$



3. Calculate each quotient. Use counters to help you.

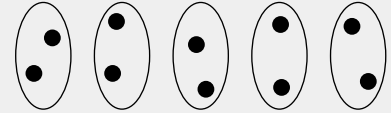
a)  $6 \div 2 = \frac{3}{1}$

b)  $15 \div 3 = \frac{5}{1}$

c)  $20 \div 4 = \frac{5}{1}$

**At-Home Help**

$10 \div 5 = 2$  is a **division sentence**. The **quotient** is 2.



is a picture of the **division model** for sharing 10 counters equally in 5 groups.

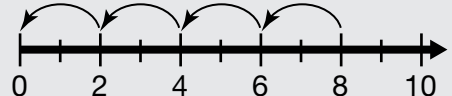
# Grouping to Divide

**Goal** Divide by counting equal groups.

You will need buttons, bread tags, toothpicks, or other small items to use as counters.

**At-Home Help**

To model  $8 \div 2$  on a number line, start at 8 and jump back by 2s to 0.



There are 4 jumps. So  $8 \div 2 = 4$ .

- 15 students work in groups of 3.
  - How many groups are there? Model your solution with counters and skip counting on the number line at the bottom of the page.

5 groups

b) Write a division sentence.  $15 \div 3 = 5$

What is the quotient? 5

- How many groups of 6 are there? Model your solution with counters or the number line at the bottom of the page.

3 groups

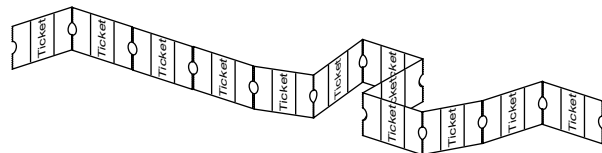


Write the division sentence.  $18 \div 6 = 3$

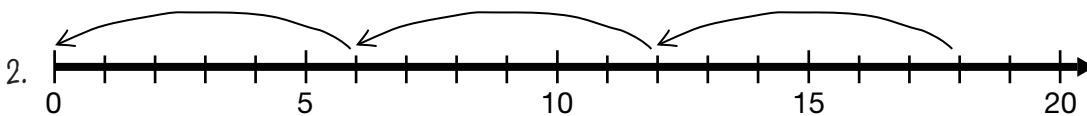
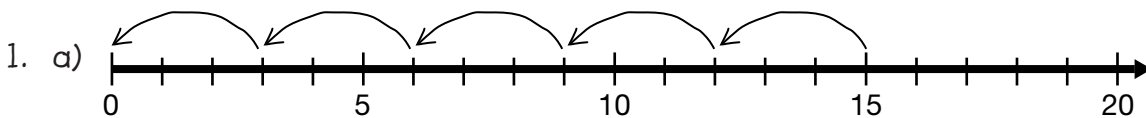
- Divide.

- a)  $12 \div 2 = \underline{6}$     c)  $24 \div 4 = \underline{6}$     e)  $16 \div 4 = \underline{4}$     g)  $12 \div 6 = \underline{2}$   
 b)  $21 \div 7 = \underline{3}$     d)  $5 \div 1 = \underline{5}$     f)  $35 \div 5 = \underline{7}$     h)  $2 \div 2 = \underline{1}$

- a) How many people can have 4 tickets each? 3 people



- b) How many people can have 5 tickets each? 2 people with 2 tickets left over



# Communicate About Division

**Goal**

Use a model to explain how to divide.

**Communication Checklist**

- Did you show enough detail?
- Did you explain your thinking?
- Did you include a diagram?

1. Solve this problem and explain your steps. Use the Communication Checklist.

Ian has 40 plums and 3 baskets. He puts an equal number of plums in each basket. How many plums go in each basket?

For example:

I used 40 counters because there were 40 plums.

I folded a piece of paper into 3 parts because there are 3 baskets. I put 1 counter in each part

to start. Then I kept on taking out 3 counters at

a time and putting 1 in each part. I did that as

many times as I could. Finally, I had 1 counter left

over. Then I found that there were 13 counters

in each part. So that means Ian could put 13

plums in each basket, but he would have 1 left

over. Maybe he would eat it or maybe he could

find 2 more plums and put 1 more in each basket,

then there would be 14 in each basket.

**At-Home Help**

Fariba gives out 12 cookies, 2 cookies to each person. How many people will get cookies?

$$12 \div 2 = 6$$

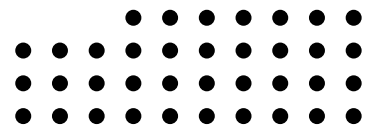
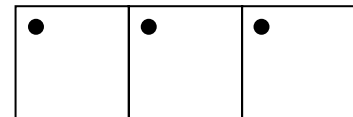
So 6 people get cookies.

Here is an explanation of the solution.

“There are 12 cookies. Each person gets 2 cookies. I want to find out how many people will get cookies before the 12 cookies are gone. I can group 12 counters 2 at a time.



I can make 6 groups of 2. So 6 people will get cookies.”



# Exploring Division Patterns

**Goal** Identify, describe, and extend division patterns.

You will need 3 pencils of different colours.

- This chart shows the first 50 numbers of a 100 chart. Use a different coloured pencil to answer each of parts a) to c).
  - If a number is divisible by 2, print **2** in its square.
  - If a number is divisible by 5, print **5** in its square.
  - If a number is divisible by 10, print **10** in its square.

The numbers for the first row are done. Add the colour.

1	2 2	3	4 2	5 5	6 2	7	8 2	9	10 2 5 10
11	12 2	13	14 2	15 5	16 2	17	18 2	19	20 2 5 10
21	22 2	23	24 2	25 5	26 2	27	28 2	29	30 2 5 10
31	32 2	33	34 2	35 5	36 2	37	38 2	39	40 2 5 10
41	42 2	43	44 2	45 5	46 2	47	48 2	49	50 2 5 10

2. a) What numbers in the chart are divisible by both 5 and 2?

10, 20, 30, 40, 50

- b) What else do you know about the numbers from part a)?

They end in 0. They are the numbers divisible by 10.

3. Write the next 2 numbers after 50 that are divisible

a) by 10 60 and 70    b) by 5 55 and 60    c) by 2 52 and 54

## At-Home Help

12 counters can be put into groups of 2 with no counters left over. So 12 can be divided by 2 with nothing left over. This means that 12 is **divisible** by 2.

# Estimating Quotients

**Goal**

**Solve division problems using estimation.**

Estimates will vary. Examples are given.

1. a) 4 students are buying a gift for \$21.  
About how much does each student have to pay? Show your work.

About \$5, because  $4 \times 5 = 20$ , so  $21 \div 4$  is about 5.

- b) With tax and gift wrap, the cost of the gift is \$26. About how much does each student have to pay? Show your work.

About \$6 because  $4 \times 6 = 24$ , so  $26 \div 4$  is about 6.  
Or about \$7 because  $4 \times 7 = 28$ , so  $26 \div 4 =$  about 7.

2. Estimate. Write the number sentence you used for each.

- |                                    |                                     |
|------------------------------------|-------------------------------------|
| a) $13 \div 3$ is about <u>4</u> . | <u><math>3 \times 4 = 12</math></u> |
| b) $23 \div 4$ is about <u>6</u> . | <u><math>4 \times 6 = 24</math></u> |
| c) $12 \div 5$ is about <u>2</u> . | <u><math>5 \times 2 = 10</math></u> |
| d) $19 \div 6$ is about <u>3</u> . | <u><math>6 \times 3 = 18</math></u> |
| e) $17 \div 4$ is about <u>4</u> . | <u><math>4 \times 4 = 16</math></u> |

3. \$12 buys 7 markers. About how much does each marker cost?

about \$2

4. 2 students share 13 markers. About how many markers does each student get?

about 6 markers

**At-Home Help**

Estimated quotients are answers that are close to the actual quotient. Use facts you know to estimate.

For example,  $13 \div 3$  is about 4 because  $3 \times 4 = 12$ .

$12 \div 5$  is about 2 because  $5 \times 2 = 10$  or because  $6 \times 2 = 12$ .

# Division Strategies

**Goal**

Use estimation and multiplication to solve division problems with greater numbers.

You will need a calculator.

1. An office tower is 203 m high. A 2-storey house is 8 m high. About how many houses can be stacked to be as high as the office tower? To find out, complete the following.

I need to divide  $\frac{203}{\quad}$  by 8.

If  $\frac{203}{\quad} \div 8 = \blacksquare$ , then  $\blacksquare \times 8 = \frac{203}{\quad}$ .

Estimates will vary. For example:

**Guess**

**Test by using a calculator to multiply**

60 houses	$60 \times 8 = 480$	480 is way too high.
$\frac{20}{\quad}$ houses	$\frac{20}{\quad} \times 8 = \frac{160}{\quad}$	$\frac{\quad}{\quad}$ too low
$\frac{25}{\quad}$ houses	$\frac{25}{\quad} \times 8 = \frac{200}{\quad}$	$\frac{\quad}{\quad}$ pretty close
$\frac{\quad}{\quad}$ houses	$\frac{\quad}{\quad} \times 8 = \frac{\quad}{\quad}$	$\frac{\quad}{\quad}$
$\frac{\quad}{\quad}$ houses	$\frac{\quad}{\quad} \times 8 = \frac{\quad}{\quad}$	$\frac{\quad}{\quad}$

About  $\frac{25}{\quad}$  houses can be stacked to be as high as the tower.

2. Use guess and test and multiplying.
- a) Mary's birthday is 75 days away. About how many weeks away is her birthday?
- about 10 weeks, or about 11 weeks
- b) Tennis ball containers hold 3 balls each. How many containers would be needed to hold 65 balls?
- about 22 containers

## At-Home Help

If you use guessing and testing with multiplying, you can avoid having to divide with a calculator, which can give an answer with a decimal part. For example,  $203 \div 8$  is 25.375.

# Test Yourself

Circle the correct answer.

1. In the division  $15 \div 5 = 3$ , which number is the quotient?

A. 15

B. 5

**C. 3**

D.  $\div$

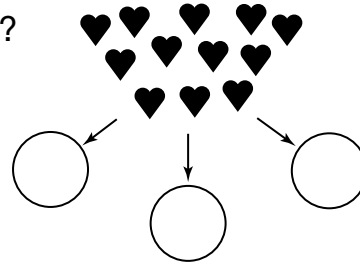
2. Which division sentence matches the picture?

E.  $12 \div 4 = 3$

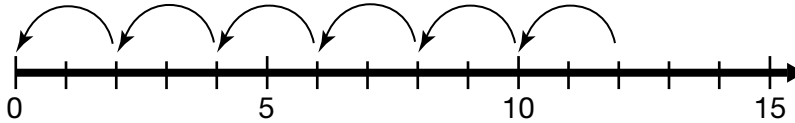
G.  $12 \div 6 = 2$

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

H.  $12 \div 2 = 6$



3. Which division fact is shown?



A.  $10 \div 2 = 5$

B.  $10 \div 5 = 2$

**C.  $12 \div 2 = 6$**

D.  $12 \div 3 = 4$

4. Which question is **not** part of the Communication Checklist?

E. Did you show enough detail?

G. Did you explain your thinking?

F. Did you include a diagram?

**H. Did you divide?**

5. Which number is divisible by 2?

A. 23

**B. 24**

C. 25

D. 29

6. Which number is divisible by 5?

E. 23

F. 24

**G. 25**

H. 29

7. Which number is divisible by 10?

A. 15

B. 35

**C. 90**

D. 55

8. Which is the best estimate for  $13 \div 4$ ?

E. about 1

**F. about 3**

G. about 5

H. about 7

9. Which is the best estimate for  $35 \div 6$ ?

A. about 2

B. about 4

**C. about 6**

D. about 8

10. 242 muffins will be put in packages of 4. About how many packages are needed? Use guessing and testing and a calculator to multiply.

**E. 60**

F. 40

G. 80

H. 50