

## WARM UP

*Make friends with parenthesis.*

**1.** Write down expressions which match the statements.

a) difference of 100 and 99 is added to 200 \_\_\_\_\_

b) product of 15 and 4 is subtracted from 90 \_\_\_\_\_

c) the product of 20 and 5 added to a difference to 50 and 5  
\_\_\_\_\_

d) the quotient of 28 and 4 is subtracted from a product of 3 and 9  
\_\_\_\_\_

**2.** Insert parenthesis where needed to make the number sentences correct:

$2 \times 3 + 5 = 16$

$9 \times 7 - 2 = 45$

$6 \times 4 + 6 \times 4 = 28$

$8 + 20 \div 4 = 7$

$26 - 56 \div 8 = 19$

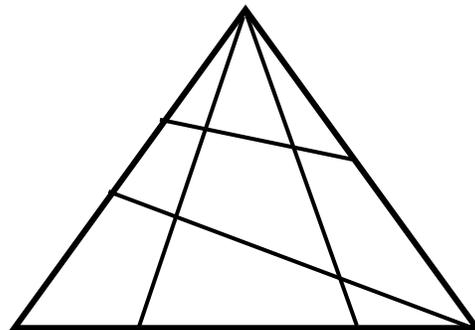
$20 \div 5 - 3 = 10$

**3.**  $17 - 24 \div 2 + 4 \times 3 =$  \_\_\_\_\_

$(6 \times 4) \div 12 - 72 \div 8 + 9 =$  \_\_\_\_\_

## REVIEW Homework

**4.** How many triangles?





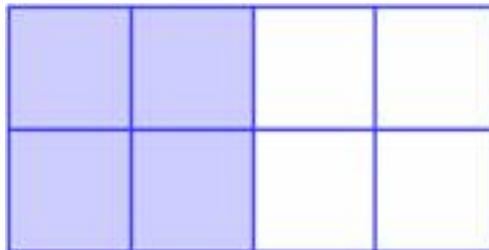
## NEW MATERIAL

Many problems in mathematics deal with **whole numbers**, which are used to count whole units of things. For example, you can count students in a classroom and the number of dollar bills.

You need other kinds of numbers to describe units that are not whole. For example, an aquarium might be partly full. A group may have a meeting, but only some of the members are present.

**Fractions are numbers used to refer to a part of a whole.** This includes measurements that cannot be written as whole numbers. For example, the width of a piece of notebook paper is more than 2 cm but less than 3cm. The part longer than 2cm is written as a fraction. Here, you will investigate how fractions can be written and used to represent quantities that are parts of the whole.

A whole can be divided into parts of equal size. In the example below, a rectangle has been divided into eight equal squares. Four of these eight squares are shaded.



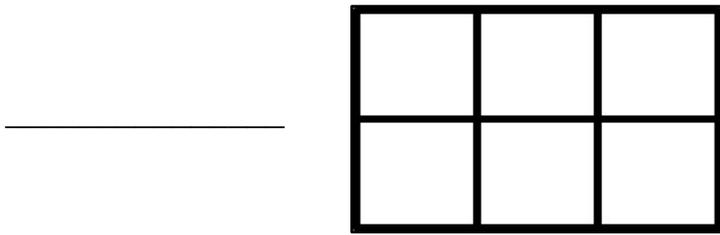
The shaded area can be represented by a fraction. A fraction is written vertically as two numbers with a line between them.

The **denominator** (the bottom number) represents the number of equal parts that make up the whole. The **numerator** (the top number) describes the number of parts that you are describing

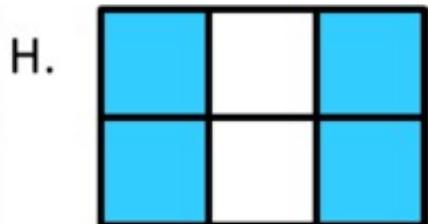
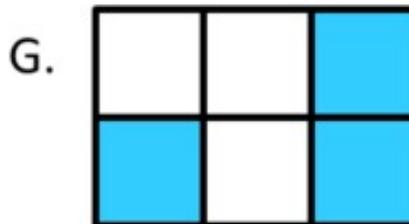
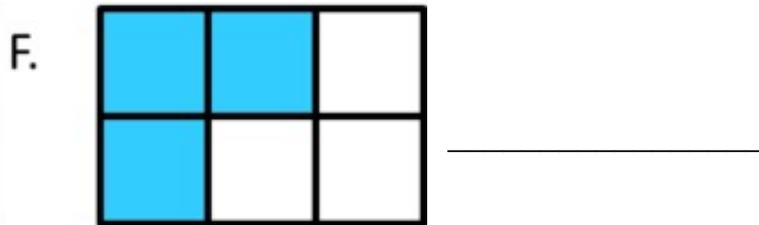
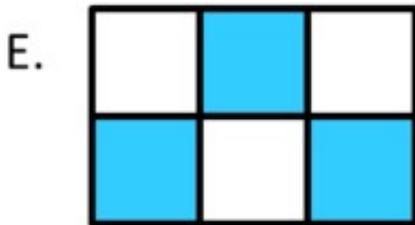
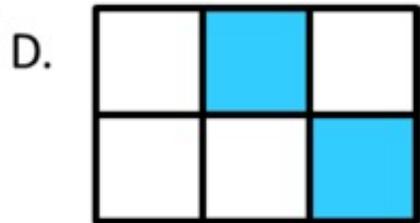
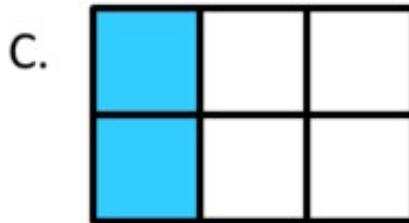
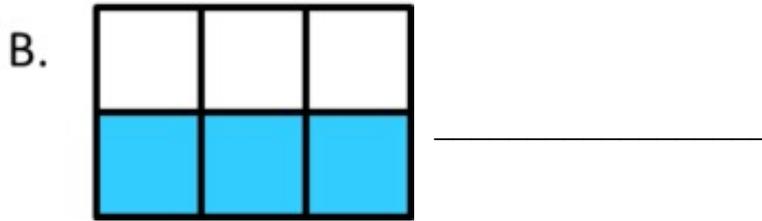
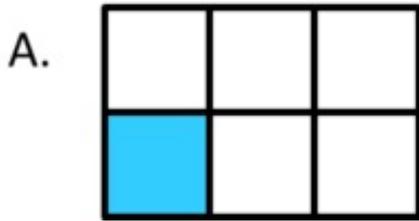
Looking into the example above, the rectangle has been divided into 8 equal parts, and 4 of them have been shaded. You can use the fraction  $\frac{4}{8}$  to describe the shaded part of the whole.

In  $\frac{4}{8}$ , the 4 is the numerator and tells how many parts are shaded. The 8 is the denominator and tells how many parts are required to make the whole.

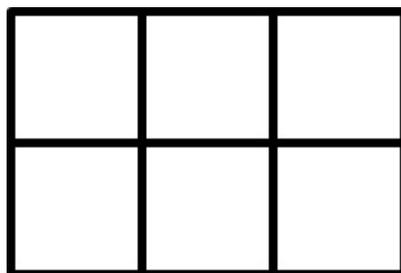
8. a) Each small square is a square unit. What is the area of this rectangle? Explain.



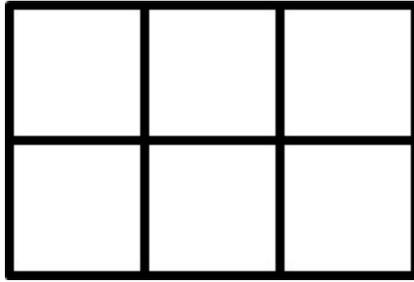
- b) What fraction of the area of each rectangle is shaded blue? Name the fraction in as many ways as you can. Explain your answers.



- c) Shade  $\frac{1}{2}$  of the area of rectangle in a way that is different from the rectangles above.



d) Shade  $\frac{2}{3}$  of the area of the rectangle in a way that is different from the rectangles above.



9. a) Using a ruler, locate 1 on the number line. Label the point. Be as exact as possible.



- b) The number line below shows two numbers, 0 and 1. Where is  $\frac{1}{4}$  on this number line?



10. There are total of 11 children in the class. 2 out of 11 are girls. Write the fraction for the number of girls \_\_\_\_\_

9 out of 11 are boys. Write down the fraction for the number of boys \_\_\_\_\_

### Did you know ...

Adopted from an article by Liz Pumfrey.

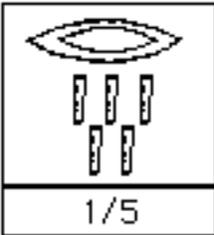
Did you know that fractions as we use them today didn't exist in Europe until the 17th century? In fact, at first, fractions weren't even thought of as numbers in their own right at all, just a way of comparing whole numbers with each other. Who first used fractions? Were they always written in the same way? How did fractions reach us here?

The word fraction actually comes from the Latin "**fractio**" which means **to break**.

Fractions were invented to express numbers that are in between of whole numbers. We use fractions all the time in everyday life:

- Cooking for 2 people but the recipe serves 4?
- Splitting pizzas, candies, toys
- Going shopping during the sale? Two for the price of one, buy one and get one at 50% off, 10 off for some products?
- TIME: An hour and a half. A quarter of an hour. Time is commonly measured in fractions.

The Egyptians wrote all their fractions using what we call unit fractions. A unit fraction has 1 as its numerator (top number). They put a mouth picture (which meant part) above a number to make it into a unit fraction. For example:



Here is one fifth.

In Ancient Rome, fractions were only written using words to describe part of the whole. They were based on the unit of weight which was called the as. One "as" was made up of 12 uncia so fractions were centered on twelfths. For example:

1/12 was called uncia

6/12 was called semis

1/24 was called semuncia

1/44 was called scripulum

In India fractions were written very much like we do now, with one number (the numerator) above another (the denominator), but without a line. For example:

$$\begin{array}{c} 7 \\ - \end{array} = \frac{7}{15}$$

It was the Arabs who added the line (sometimes drawn horizontally, sometimes on a slant) which we now use to separate the numerator and denominator:  $\frac{3}{4}$

So here we have the fraction as we now recognize it. It is amazing to think how much thought has gone into the way we write it down, isn't it?