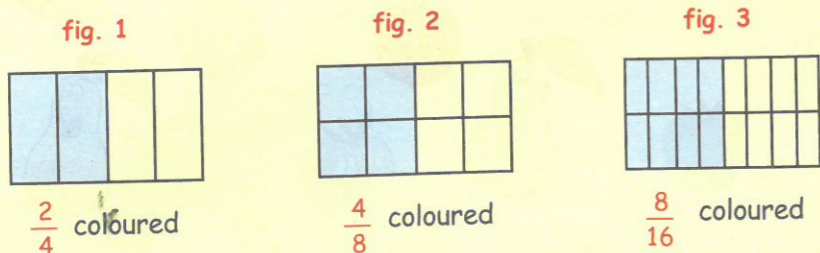


Equivalent Fractions

Two fractions might look different because they have different **numerators** and different **denominators** but they might still represent the same number.

Look at these diagrams representing fractions :-



In each shape $\frac{1}{2}$ has been coloured.

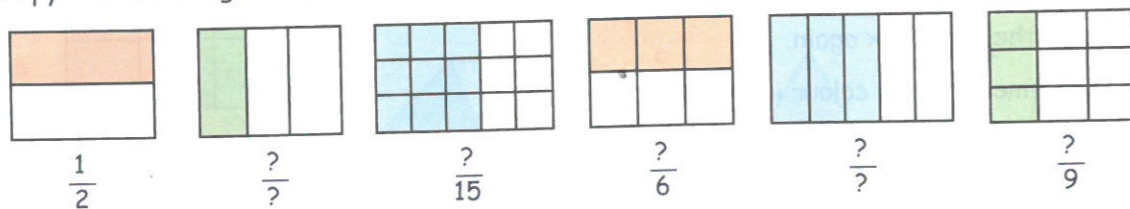
$$\text{This means } \frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{8}{16}$$

These are called **equivalent** fractions. (**Equivalent** means the **same as**).

Recognise and be able to find equivalent fractions

Exercise 3

1. Copy the following and write down underneath each figure what fraction is shaded.



- a From the pictures you can see another fraction equal to $\frac{1}{2}$. ($\frac{1}{2} = \frac{?}{?}$).
- b The second and last diagrams show that $\frac{1}{3}$ is the same as $\frac{?}{?}$.
- c The third and the fifth diagram show that $\frac{?}{15}$ is the same as $\frac{?}{?}$.

It is possible to find a fraction **equivalent** to $\frac{1}{4}$ by simply "multiplying the numerator and the denominator by the same number" :-

$$\Rightarrow \frac{1}{4} \text{ becomes } \frac{1 \times 5}{4 \times 5} = \frac{5}{20} \begin{array}{l} \text{numerator} \times 5 \\ \text{denominator} \times 5 \end{array}$$

2. a Multiply the top and the bottom of $\frac{1}{5}$ by 2 to create a new fraction. What is it?
- b Multiply the top and the bottom of $\frac{1}{5}$ by 3 to create a new fraction. What is it?
- c Multiply the top and the bottom of $\frac{1}{5}$ by 10 to create a new fraction. What is it?

3. a Multiply the top and the bottom of $\frac{2}{3}$ by 2 to create a new fraction. What is it?
- b Multiply the top and the bottom of $\frac{2}{3}$ by 3 to form a new fraction. What is it?
- c Find **four** more fractions equivalent to $\frac{2}{3}$.

4. Multiply the top and bottom of each fraction by 2 to create a new fraction **equivalent** to the one given :-

a $\frac{1}{2}$ b $\frac{2}{5}$ c $\frac{3}{7}$ d $\frac{5}{8}$ e $\frac{9}{10}$ f $\frac{11}{15}$

5. Repeat question 4, but multiply the top and bottom of each fraction by 3.

6. Multiply the top and bottom of each fraction by a number of your own choice to create a new fraction **equivalent** to the one given :-

a $\frac{2}{3}$ b $\frac{5}{7}$ c $\frac{7}{9}$ d $\frac{3}{8}$ e $\frac{7}{10}$ f $\frac{5}{12}$

We can **SIMPLIFY** fractions (like $\frac{15}{18}$) by "dividing" top and bottom by a number.

$$\Rightarrow \frac{15}{18} \text{ becomes } \frac{15 \div 3}{18 \div 3} = \frac{5}{6} \quad (\text{This cannot be simplified any further}).$$

7. Divide the top line and bottom line of each fraction by 2, to simplify each one :-

a $\frac{6}{8}$ b $\frac{2}{12}$ c $\frac{10}{14}$ d $\frac{6}{16}$ e $\frac{18}{20}$ f $\frac{86}{100}$

8. Divide the top line and bottom line of each fraction by 3, to simplify each one :-

a $\frac{3}{6}$ b $\frac{6}{9}$ c $\frac{9}{12}$ d $\frac{9}{15}$ e $\frac{18}{21}$ f $\frac{15}{27}$

9. For each of the following fractions, divide the numerator and the denominator by a number to **simplify** the fraction :- (*Check that your answer can't be simplified further*).

a $\frac{15}{18} \div 3$ b $\frac{4}{10}$ c $\frac{6}{18}$ d $\frac{7}{14}$ e $\frac{10}{25}$ f $\frac{20}{30}$
 g $\frac{12}{16}$ h $\frac{10}{15}$ i $\frac{9}{21}$ j $\frac{20}{24}$ k $\frac{12}{15}$ l $\frac{18}{20}$
 m $\frac{30}{40}$ n $\frac{10}{100}$ o $\frac{40}{60}$ p $\frac{25}{100}$ q $\frac{6}{60}$ r $\frac{5}{100}$

10. Simplify as far as possible :-

a $\frac{22}{33}$ b $\frac{26}{39}$ c $\frac{30}{45}$ d $\frac{360}{480}$ e $\frac{63}{99}$ f $\frac{34}{51}$