

# MATHEMATICS



**N.S. Yr. 4 P.22**

**Use fraction notation and recognise equivalent fractions. Order familiar fractions.**

## Equipment

Paper, pencil, ruler

# MathSphere

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## Concepts

Children should be able to understand the meaning of and be able to spell and read these words:

*Fraction, half, quarter, eighth, third, sixth, fifth, tenth, twentieth.*

The reading of fractions is important and  $\frac{1}{10}$  for instance should be read as 'one tenth'. Other simple fractions should be recognised such as  $\frac{3}{4}$  and  $2\frac{4}{5}$ .

Following on from previous work on fractions, children should understand the relationship between fractions of different sizes, for example that one half is more than one quarter, but less than three quarters. As an extension, they should know that a mixed number lies between the two whole numbers on either side, for example that  $4\frac{3}{4}$  is between 4 and 5.

They should be able to see whether familiar fractions involving quarters and eighths are smaller or more than one half.

### **Equivalent fractions.**

The key to understanding fractions is **equivalent fractions**. With a good understanding of the idea of equivalence and one or two further ideas, most problems in fractions may be solved easily and quickly. This idea will be introduced here and developed further in subsequent modules.

**Equivalent fractions** are fractions that look different, but have the same value, e.g.  $\frac{3}{6}$  and  $\frac{1}{2}$ . Children should be able to establish equivalence by sorting a number of items into different groups and should know some simple equivalencies such as  $\frac{4}{6}$  equals  $\frac{2}{3}$ .

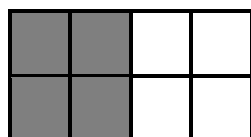
Children should be able to see whether simple fractions are more or less than one half. They can do this by putting the fractions on a 0 to 1 number line.

When using fractions with young children, they should be written with a horizontal

line thus:  $\frac{3}{4}$  and not as  $\frac{3}{4}$  as adults tend to do.

1.

In this rectangle there are 8 squares.



And 4 of them are shaded.



The fraction shaded is  $\frac{4}{8}$ . This is the same as  $\frac{1}{2}$ , because a half of the rectangle is shaded.

a)



How many squares are there in this rectangle?

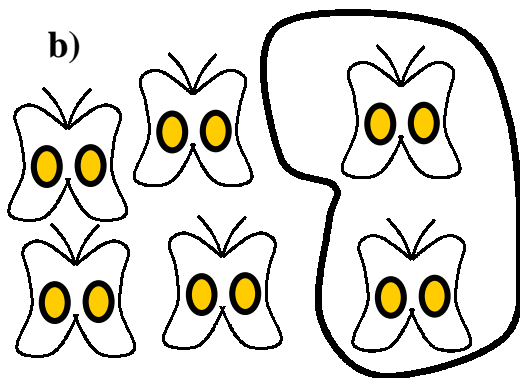
How many squares are shaded?

What fraction is shaded?

Which is this the same as:

$\frac{1}{4}$ ,  $\frac{1}{2}$  or  $\frac{2}{5}$  ?

b)



How many butterflies are there?

How many butterflies are ringed?

What fraction is ringed?

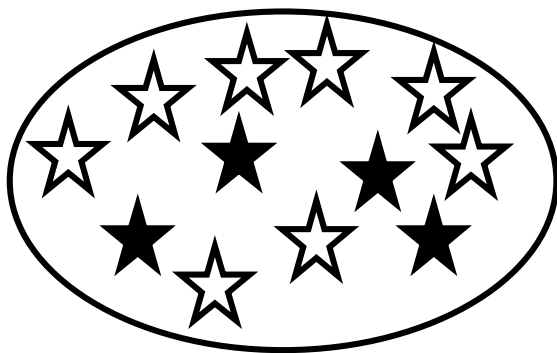
Which is this the same as:

$\frac{1}{3}$ ,  $\frac{1}{2}$  or  $\frac{1}{6}$  ?

I love butterflies!



1.



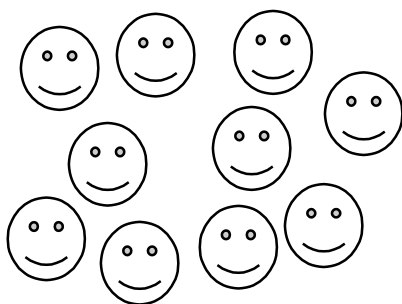
How many stars are there?

How many are shaded?

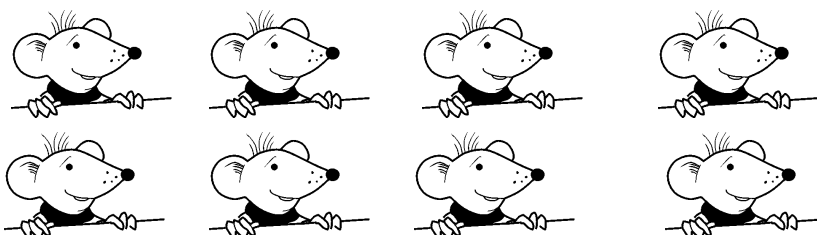
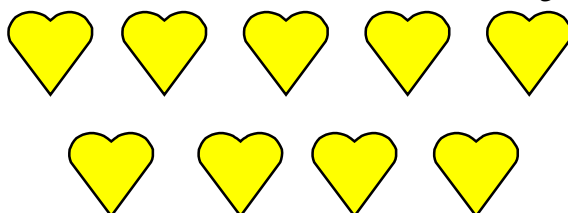
What fraction are shaded?

Can you make a simpler fraction from your answer?

2. Here are ten faces. Put a ring around a half of them.



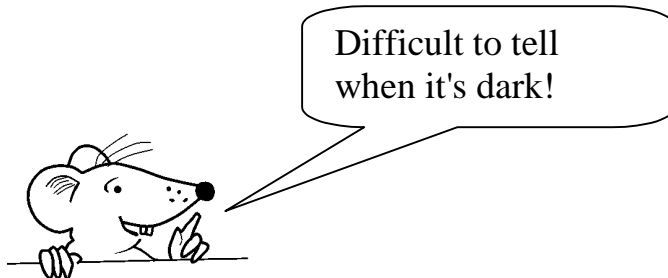
3. Here are 8 moons. Put a ring around a quarter of them.

4. Here are eight Multys. Put a ring around  $\frac{3}{4}$  of them.5. Here are nine hearts. Put a ring around  $\frac{2}{3}$  of them.

1. Draw six squares and shade  $\frac{1}{2}$  of them.
2. Draw **12** matchstick people and ring  $\frac{2}{3}$  of them.
3. Draw **20** triangles and ring  $\frac{1}{5}$  of them.

Why is  $\frac{1}{5}$  the same as  $\frac{4}{20}$  ?

4. In class 4A there are **20** pupils. **10** of them are girls.  
What fraction are girls?
5. In a group of **8** dogs, **3** are labradors. What fraction are labradors?
6. I have twenty coins in my pocket. Five are **50p** pieces.  
What fraction are **50p** pieces?
7. Jane had **30p**, but she spent **15p**.  
What fraction of her money did she spend?
8. Divvy had **6** cakes and ate **4** of them. What fraction did Divvy eat?
9. There were fifteen cars in a car park. Five were red.  
What fraction were red?  
What fraction were **not** red?

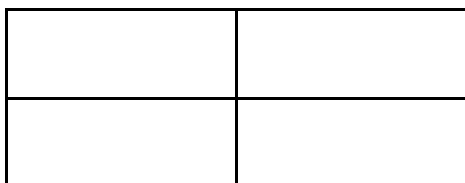


10. How many letters are there in this sentence?  
What fraction of these are 'a's'?
11. Sixteen Martians visit Earth. Twelve of them are green.  
What fraction are green?  
What fraction are **not** green?

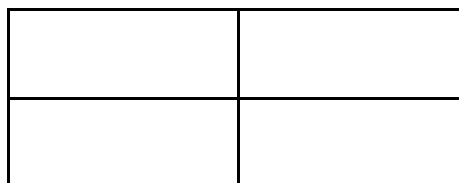
Fractions which look different, but are really the same are called  
**equivalent fractions.**

$\frac{1}{2}$  and  $\frac{2}{4}$  are equivalent fractions.

1. Shade  $\frac{1}{2}$  of this rectangle.

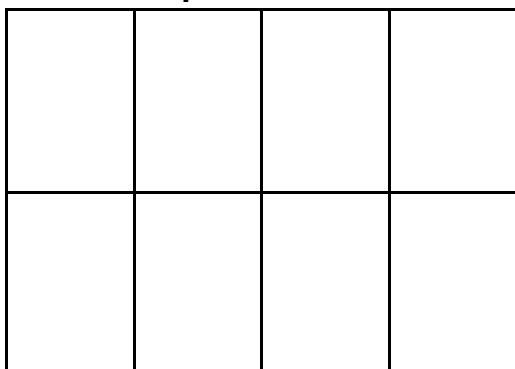


Shade  $\frac{2}{4}$  of this rectangle, making the same pattern.

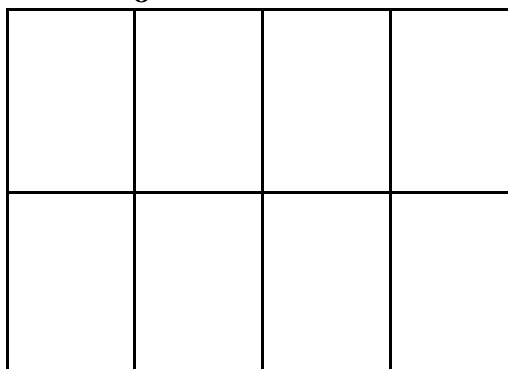


This shows that  $\frac{1}{2}$  and  $\frac{2}{4}$  are equivalent.

2. Shade  $\frac{3}{4}$  of this rectangle.

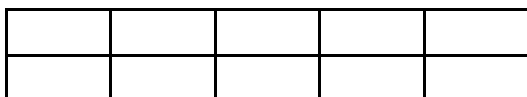


Shade  $\frac{6}{8}$  of this rectangle.

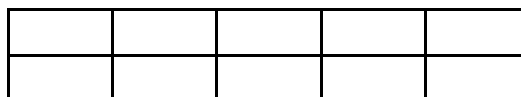


What does this show?

3. Shade  $\frac{4}{10}$  of this rectangle.

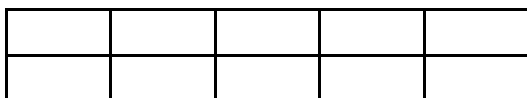


Shade  $\frac{2}{5}$  of this rectangle.

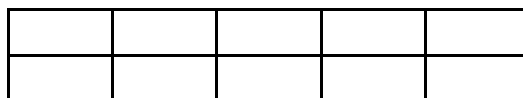


What does this show?

1. Shade  $\frac{3}{5}$  of this rectangle.

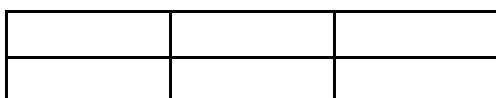


Shade  $\frac{6}{10}$  of this rectangle.

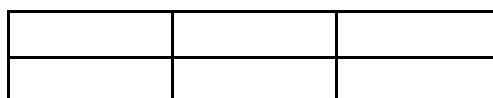


What does this show?

2. Shade  $\frac{2}{3}$  of this rectangle.



Shade  $\frac{4}{6}$  of this rectangle.

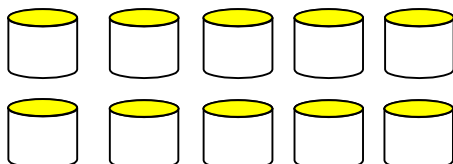


What does this show?

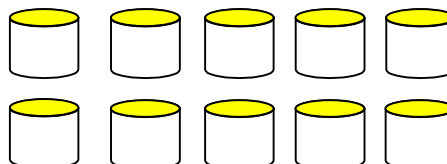
Shades? I have a pair already, thank you.



3. Ring  $\frac{4}{5}$  of these cylinders.

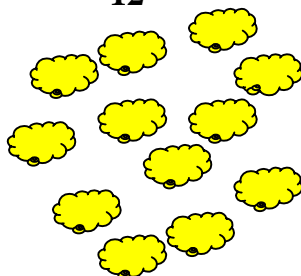


Ring  $\frac{8}{10}$  of these cylinders.

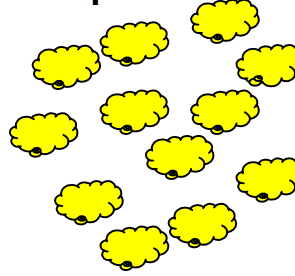


What does this show?

4. Ring  $\frac{9}{12}$  of these clouds.



Ring  $\frac{3}{4}$  of these clouds.



What does this show?

1. Make **equivalent fractions** by putting a number in the boxes.

a)  $\frac{1}{2} = \frac{\boxed{\phantom{00}}}{4}$

b)  $\frac{1}{2} = \frac{3}{\boxed{\phantom{00}}}$

c)  $\frac{2}{5} = \frac{\boxed{\phantom{00}}}{10}$

d)  $\frac{1}{\boxed{\phantom{00}}} = \frac{5}{15}$

2. a) How many **halves** make a **whole one**?

b) How many **fifths** make a **whole one**?

c) How many **tenths** make a **whole one**?

3. a) What do you need to add to  $\frac{7}{10}$  to make **one whole one**?

b) What do you need to add to  $\frac{4}{5}$  to make **one whole one**?

c) What do you need to add to  $\frac{2}{6}$  to make **one whole one**?

4.

To find a fraction of a number we can do a division sum.

To find a **half** of **16**, we can **divide by 2**.

$$\text{Half of } 16 = 16 \div 2 = 8$$

To find a **quarter** of **20**, we can **divide by 4**.

What is a quarter of 20?





1.



Can you tell if a fraction is greater or less than one half? If you need help, don't forget you can draw a diagram like this:



Three quarters is **greater** than one half!!

Which of these fractions are greater than a half and which are less?  
Write them in the correct box.

$$\frac{1}{4} \quad \frac{3}{8} \quad \frac{5}{8} \quad \frac{3}{4} \quad \frac{1}{8} \quad \frac{7}{8}$$

Less than a half

Greater than a half

2. This set of fractions has fractions **less** than a half, **more** than a half and some that are **equal** to a half. Can you put them in the correct boxes?

$$\frac{1}{5} \quad \frac{8}{10} \quad \frac{5}{8} \quad \frac{5}{10} \quad \frac{1}{2} \quad \frac{6}{10} \quad \frac{2}{3} \quad \frac{3}{8} \quad \frac{3}{6} \quad \frac{1}{3}$$

Less than a half

Equal to a half

More than a half

1.



Can you tell if a fraction is greater or less than one half? If you need help, don't forget you can draw a diagram like this:



Five sevenths is **greater** than one half!!

Which of these fractions are **greater than a half** and which are **less**? Write them in the correct box.

$$\frac{75}{100}$$

$$\frac{1}{20}$$

$$\frac{7}{10}$$

$$\frac{1}{10}$$

$$\frac{13}{20}$$

$$\frac{2}{5}$$

**Less than a half**

--

**Greater than a half**

--

2. This set of fractions has fractions **less** than a half, **more** than a half and some that are **equal** to a half. Can you put them in the correct boxes?

$$\frac{2}{3}$$

$$\frac{8}{10}$$

$$\frac{1}{9}$$

$$\frac{5}{6}$$

$$\frac{1}{3}$$

$$\frac{5}{9}$$

$$\frac{10}{20}$$

$$\frac{1}{6}$$

$$\frac{50}{100}$$

$$\frac{17}{20}$$

**Less than a half**

--

**Equal to a half**

--

**More than a half**

--

**Answers****Page 3**

1. a) 10 squares, 5 shaded,  $\frac{5}{10}$  shaded, same as  $\frac{1}{2}$   
 b) 6 butterflies, 2 ringed,  $\frac{2}{6}$  ringed, same as  $\frac{1}{3}$

**Page 4**

1. 12 stars, 4 black,  $\frac{4}{12}$  black, same as  $\frac{1}{3}$  or  $\frac{2}{6}$
2. Any 5 ringed
3. Any 2 ringed
4. Any six ringed
5. Any six ringed.

**Page 5**

1. Child draws six squares and shades three of them.
2. Child draws twelve people and rings eight of them.
3. Child draws twenty triangles and rings four of them. Same because selecting four from twenty is the same as grouping in fours and choosing one of the five groups.
4.  $\frac{10}{20}$  or  $\frac{1}{2}$
5.  $\frac{3}{8}$
6.  $\frac{5}{20}$  or  $\frac{1}{4}$
7.  $\frac{15}{30}$  or  $\frac{1}{2}$
8.  $\frac{4}{6}$  or  $\frac{2}{3}$
9. Red  $\frac{5}{15}$  or  $\frac{1}{3}$  Not red  $\frac{10}{15}$  or  $\frac{2}{3}$
10. 36 letters.  $\frac{2}{36}$  or  $\frac{1}{18}$  are 'a'.
11. Green  $\frac{12}{16}$  or  $\frac{3}{4}$  Not green  $\frac{4}{16}$  or  $\frac{1}{4}$

**Page 6**

1. In each diagram, shade 2 smaller rectangles.
2. Shade any six smaller rectangles in each diagram. This shows  $\frac{3}{4}$  and  $\frac{6}{8}$  are equivalent.
3. Shade any four small rectangles in each diagram. This shows  $\frac{4}{10}$  and  $\frac{2}{5}$  are equivalent.

**Page 7**

1. Shade any 6 small rectangles in each diagram. This shows  $\frac{3}{5}$  and  $\frac{6}{10}$  are equivalent.
2. Shade any 4 small rectangles in each diagram. This shows  $\frac{2}{3}$  and  $\frac{4}{6}$  are equivalent.
3. Ring any 8 cylinders. This shows  $\frac{4}{5}$  and  $\frac{8}{10}$  are equivalent.
4. Ring any 9 clouds. This shows  $\frac{9}{12}$  and  $\frac{3}{4}$  are equivalent.

**Page 8**

1. a)  $\frac{1}{2} = \frac{2}{4}$       b)  $\frac{1}{2} = \frac{3}{6}$       c)  $\frac{2}{5} = \frac{4}{10}$       d)  $\frac{1}{3} = \frac{5}{15}$
2. a) 2      b) 5      c) 10
3. a)  $\frac{3}{10}$       b)  $\frac{1}{5}$       c)  $\frac{4}{6}$
4. 5

**Answers****Page 9**

1. Less than a half:  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{8}$  Greater than a half:  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $\frac{7}{8}$   
2. Less than a half:  $\frac{1}{5}$ ,  $\frac{3}{8}$ ,  $\frac{1}{3}$  Equal to a half:  $\frac{5}{10}$ ,  $\frac{1}{2}$ ,  $\frac{3}{6}$   
Greater than a half:  $\frac{8}{10}$ ,  $\frac{5}{8}$ ,  $\frac{6}{10}$ ,  $\frac{2}{3}$

**Page 10**

1. Less than a half:  $\frac{1}{20}$ ,  $\frac{1}{10}$ ,  $\frac{2}{5}$  Greater than a half:  $\frac{75}{100}$ ,  $\frac{7}{10}$ ,  $\frac{13}{20}$   
2. Less than a half:  $\frac{1}{9}$ ,  $\frac{1}{3}$ ,  $\frac{1}{6}$  Equal to a half:  $\frac{10}{20}$ ,  $\frac{50}{100}$   
Greater than a half:  $\frac{2}{3}$ ,  $\frac{8}{10}$ ,  $\frac{5}{6}$ ,  $\frac{5}{9}$ ,  $\frac{17}{20}$