Fraction pictures

Children use knowledge of equivalent fractions to work out what fraction each shape is as part of the whole picture, and which shapes are the same size.

Skills practised:

- Identify fractions as part of a whole
- Using knowledge of equivalent fractions

***Conjecture**: It is possible to use knowledge of equivalent fractions to identify shapes of the same size.*

What to do:

Children work individually or in pairs.
They will need copies of the fraction pictures (see child sheet).

1. Look at the first fraction picture. You are going to work out what fraction each shape is of the whole picture.
2. The blue and yellow sections are the same size, ¼ of the whole picture. The blue section is split into three equal parts. To work out what fraction of the whole picture each shape is, you need to think three of what fraction is the same size as ¼.
3. Does this help you to work out what fraction the green shapes are of the whole picture?
4. Can you see a coloured section which is the same size as the pink section? Write the pair of equivalent fractions.
5. Can you see a section which is the same size as the green section? Write the pair of equivalent fractions.

Can you use the shape picture to write any other pairs of equivalent fractions?

6. Now look at the second shape picture. Work out what fraction each shape is of the whole picture.
7. Identify equal coloured sections and write the matching equivalent fractions.

Can you use the shape picture to write any other pairs of equivalent fractions?

CHALLENGE: Draw your own shape picture with different shaped coloured sections which are the same size.

Aims:

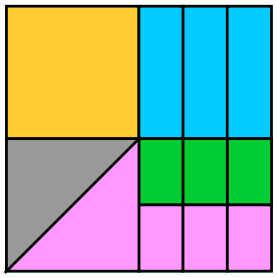
- To see that fractions of shapes need not be the same shape to be the same size
- To use knowledge of equivalent fractions to solve a problem.

Minimum number of calculations expected

N/A

Fraction pictures

1. Look at the first fraction picture.
Work out what fraction each shape is of the whole picture.



2. The blue and yellow sections are the same size, 1/4 of the whole picture.
The blue section is split into three equal parts. To work out what fraction of the whole picture each shape is, you need to think three of what fraction is the same size as 1/4.

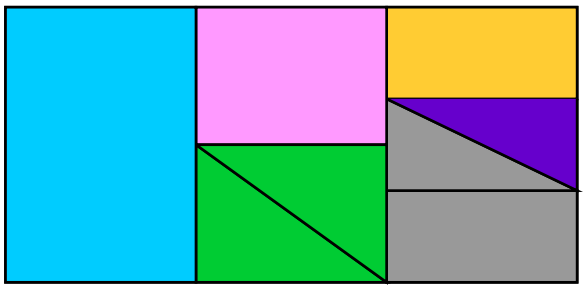
3. Does this help you to work out what fraction the green shapes are of the whole picture?

4. Can you see a coloured section which is the same size as the pink section?
Write the pair of equivalent fractions.

5. Can you see a section which is the same size as the green section?
Write the pair of equivalent fractions.

Can you use the shape picture to write any other pairs of equivalent fractions?

6. Now look at the second shape picture.
Work out what fraction each shape is of the whole picture.

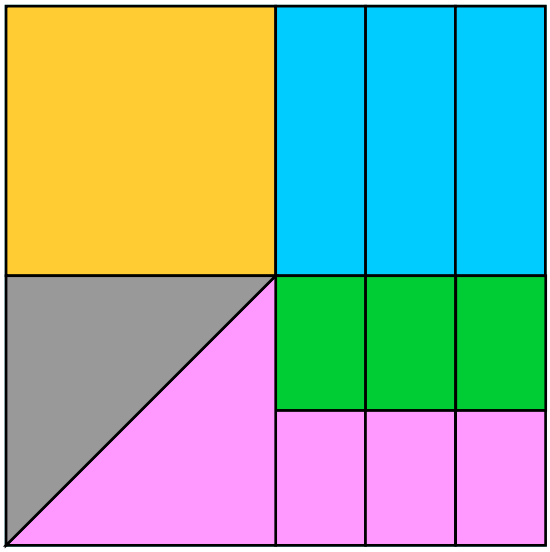


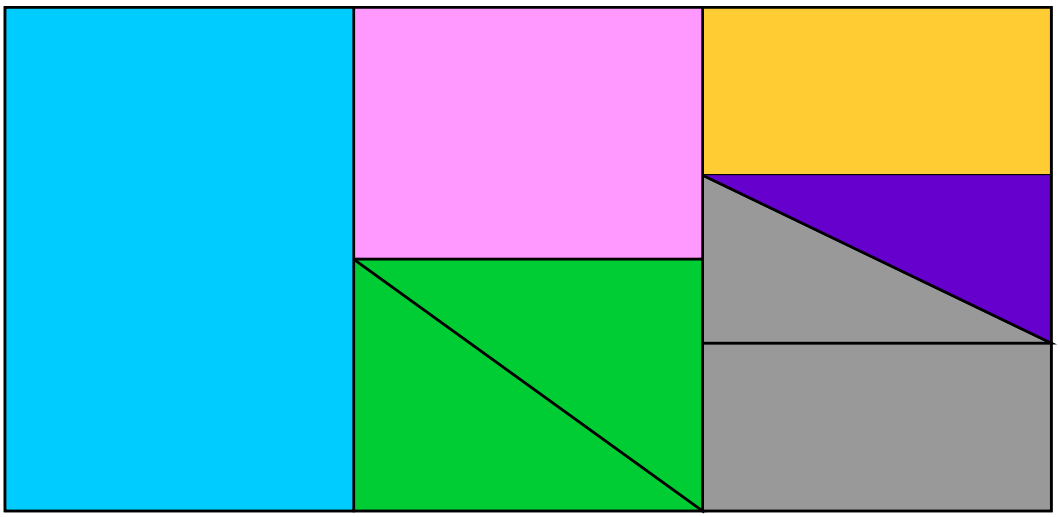
7. Identify equal coloured sections and write the matching equivalent fractions.
Can you use the shape picture to write any other pairs of equivalent fractions?

Challenge

Draw your own shape picture with different shaped coloured sections which are the same size.

Fraction pictures





Oddly friendly fractions

Children create fractions with related denominators and then add these turning improper fractions into mixed numbers.

Skills practised:

- Adding fractions with related denominators.
- Converting improper fractions to mixed numbers.

Conjecture: *We can identify a pattern in the addition of fractions with mixed numbers.*

What to do:

Children work individually or in pairs.

Remember:

The denominator is the bottom number in a fraction	The numerator is the top number in a fraction

1. Write this calculation: ½ + ¾ =
   Change the total from an improper fraction to a mixed number. Circle the answer.
2. Write this calculation: ⅔ + ⅚ =
   Again, change the total to a mixed number and circle the answer.
3. Repeat this for ¾ + ⅞.
4. Then generate the next pair of fractions in this sequence...

   The denominator of the first begins with one more than in the last pair.
   The denominator of the second fraction is double the denominator of the first fraction.
   The numerators are always as high as they can be without the fraction being equal to 1.

5. Continue creating fraction pairs in this sequence and adding them.

HINT: Your fifth pair should be ⅝ + 11/12 ... Your seventh should be ⅞ + 15/16.

Discuss what you notice about the answers in this sequence. Can you begin to explain why you get this pattern?

Challenge! Create a sequence of fraction pairs to add like the one above. But this time, choose the lowest numerator possible. What pattern do you get? Explore other possible sequences of pairs.

Aims:

- To explore patterns when adding fractions with related denominators
- To begin to explain why a pattern occurs

Minimum number of calculations expected

12-20

Oddly friendly fractions

Remember:

The denominator is the bottom number in a fraction	The numerator is the top number in a fraction

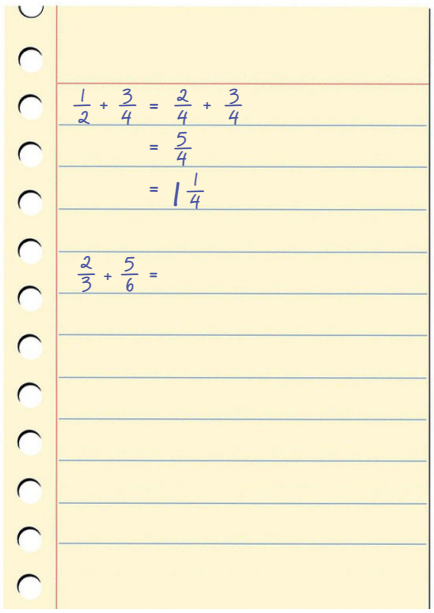
1. Write this calculation: $\frac{1}{2} + \frac{3}{4} =$, and the total. Change the total from an improper fraction to a mixed number. Circle the answer.

2. Write this calculation: $\frac{2}{3} + \frac{5}{6} =$, and the total. Again, change the total to a mixed number and circle the answer.

3. Repeat for $\frac{3}{4} + \frac{7}{8} =$

4. Then generate the next pair of fractions in this sequence...

   The denominator of the first begins with one more than in the last pair.
   The denominator of the second fraction is double the denominator of the first fraction.
   The numerators are always as high as they can be without the fraction being equal to 1.



5. Continue creating fraction pairs in this sequence and adding them.

What do you notice about the answers in this sequence?
Can you begin to explain why you get this pattern?

Challenge

Create a sequence of fraction pairs to add like the one above, but this time, choose the lowest numerator possible. What pattern do you get? Explore other possible sequences of pairs.