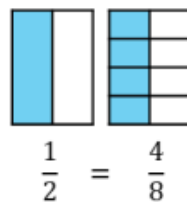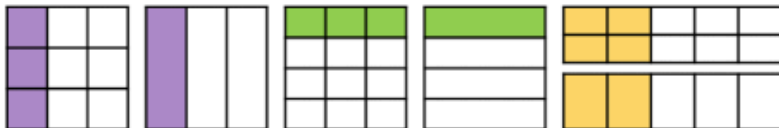# Fraction challenge questions- consolidation of learning

Equivalent fractions
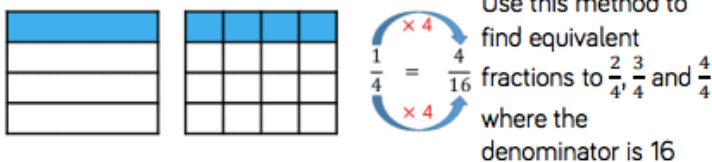
Take two pieces of paper the same size.
Fold one piece into two equal pieces.
Fold the other into eight equal pieces.
What equivalent fractions can you find?

$$\frac{1}{2} = \frac{4}{8}$$

Use the models to write equivalent fractions.

Eva uses the models and her multiplication and division skills to find equivalent fractions.

$$\frac{1}{4} = \frac{4}{16}$$

Use this method to find equivalent fractions to $\frac{2}{4}, \frac{3}{4}$ and $\frac{4}{4}$ where the denominator is 16

Eva uses the same approach to find equivalent fractions for these fractions. How will her method change?

$$\frac{4}{12} = \frac{\square}{3} \qquad \frac{6}{12} = \frac{\square}{4} \qquad \frac{6}{12} = \frac{\square}{2}$$

Rosie says,

To find equivalent fractions, whatever you do to the numerator, you do to the denominator.

Using her method, here are the equivalent fractions Rosie has found for $\frac{4}{8}$

$$\frac{4}{8} = \frac{8}{16} \qquad \frac{4}{8} = \frac{6}{10}$$

$$\frac{4}{8} = \frac{2}{4} \qquad \frac{4}{8} = \frac{1}{5}$$

Are all Rosie's fractions equivalent?
Does Rosie's method work?
Explain your reasons.

Ron thinks you can only simplify even numbered fractions because you keep on halving the numerator and denominator until you get an odd number.

Do you agree?
Explain your answer.

Here are some fraction cards.
All of the fractions are equivalent.

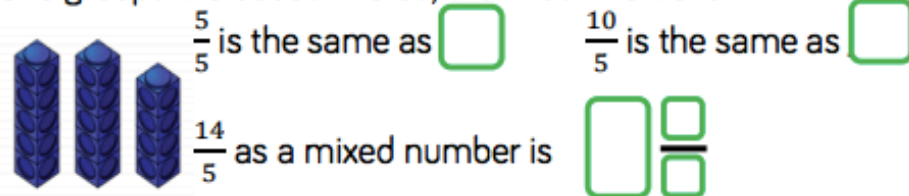$$\frac{4}{A} \qquad \frac{B}{C} \qquad \frac{20}{50}$$

A + B = 16
Calculate the value of C.

5

Fraction challenge questions- consolidation of learning
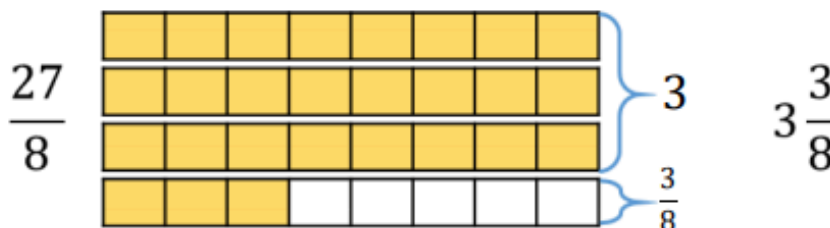
Improper fractions to mixed number

Whitney converts the improper fraction $\frac{14}{5}$ into a mixed number using cubes.
She groups the cubes into 5s, then has 4 left over.

$\frac{5}{5}$ is the same as ☐ $\frac{10}{5}$ is the same as ☐

$\frac{14}{5}$ as a mixed number is ☐ $\frac{☐}{☐}$

Use Whitney's method to convert $\frac{11}{3}, \frac{11}{4}, \frac{11}{5}$ and $\frac{11}{6}$

Tommy converts the improper fraction $\frac{27}{8}$ into a mixed number using bar models.

$\frac{27}{8}$ 3 $\frac{3}{8}$ $3\frac{3}{8}$

Use Tommy's method to convert $\frac{25}{8}, \frac{27}{6}, \frac{18}{7}$ and $\frac{32}{4}$

Amir says,

> $\frac{28}{3}$ is less than $\frac{37}{5}$ because 28 is less than 37

Do you agree?
Explain why.

Spot the mistake

- $\frac{27}{5} = 5\frac{1}{5}$

- $\frac{27}{3} = 8$

- $\frac{27}{4} = 5\frac{7}{4}$

- $\frac{27}{10} = 20\frac{7}{10}$

What mistakes have been made?

Can you find the correct answers?

Fraction challenge questions- consolidation of learning

Mixed number to improper fractions

Whitney converts $3\frac{2}{5}$ into an improper fraction using cubes.
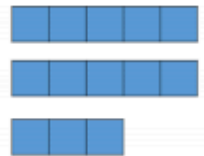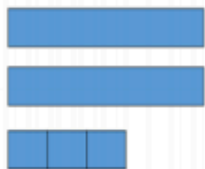
1 whole is equal to ☐ fifths.

3 wholes are equal to ☐ fifths.

☐ fifths + two fifths = ☐ fifths

Use Whitney's method to convert $2\frac{2}{3}$, $2\frac{2}{4}$, $2\frac{2}{5}$ and $2\frac{2}{6}$

Jack uses bar models to convert a mixed number into an improper fraction.

?

o r,

$2\frac{3}{5}$ = ☐ wholes + ☐ fifths

2 wholes = ☐ fifths

☐ fifths + ☐ fifths = ☐ fifths

Use Jack's method to convert $2\frac{1}{6}$, $4\frac{1}{6}$, $4\frac{1}{3}$ and $8\frac{2}{3}$

9

Three children have incorrectly converted $3\frac{2}{5}$ into an improper fraction.

Annie: $3\frac{2}{5} = \frac{6}{15}$

Mo: $3\frac{2}{5} = \frac{15}{5}$

Dexter: $3\frac{2}{5} = \frac{32}{5}$

What mistake has each child made?

Fill in the missing numbers.

How many different possibilities can you find for each equation?

$$2\frac{\square}{8} = \frac{\square}{8}$$

$$2\frac{\square}{5} = \frac{\square}{5}$$

Compare the number of possibilities you found.

Fraction challenge questions- consolidation of learning

Comparing and ordering fractions

Use bar models to compare $\frac{5}{8}$ and $\frac{3}{4}$

☐ > ☐

☐ < ☐

Use this method to help you compare:

$\frac{5}{6}$ and $\frac{2}{3}$ $\frac{2}{3}$ and $\frac{5}{9}$ $\frac{7}{16}$ and $\frac{3}{8}$

Use common numerators to help you compare $\frac{2}{5}$ and $\frac{2}{3}$

☐ > ☐

☐ < ☐

is

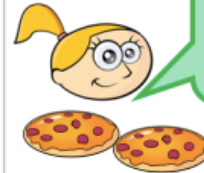Use this method to help you compare:

$\frac{6}{7}$ and $\frac{6}{8}$ $\frac{4}{9}$ and $\frac{4}{5}$ $\frac{4}{11}$ and $\frac{2}{5}$

Order the fractions from greatest to smallest:

$\frac{3}{7}, \frac{3}{5}$ and $\frac{3}{8}$ $\frac{2}{3}, \frac{5}{6}$ and $\frac{7}{12}$ $\frac{6}{11}, \frac{3}{5}$ and $\frac{2}{3}$

1ᴢ

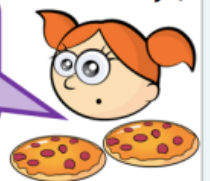Eva and Alex each have two identical pizzas.

Eva says,

I have cut each pizza into 6 equal pieces and eaten 8

Alex says,

I have cut each pizza into 9 equal pieces and eaten 15

Who ate the most pizza?

Use a drawing to support your answer.

Ron makes $\frac{3}{4}$ and $\frac{3}{8}$ out of cubes.

He thinks that $\frac{3}{8}$ is equal to $\frac{3}{4}$

Do you agree?
Explain your answer.

Always, sometimes, never?

If one denominator is a multiple of the other you can simplify the fraction with the larger denominator to make the denominators the same.

Example:

Could $\frac{?}{4}$ and $\frac{?}{12}$ be simplified to $\frac{?}{4}$ and $\frac{?}{4}$?

Prove it.

Fraction challenge questions- consolidation of learning

Adding fractions

Here is a bar model to calculate $\frac{3}{5} + \frac{4}{5}$

$$\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$$

Use a bar model to solve the calculations:

$$\frac{3}{8} + \frac{3}{8} \qquad \frac{5}{6} + \frac{1}{6} \qquad \frac{5}{3} + \frac{5}{3}$$

Here are two bar models to calculate $\frac{7}{8} - \frac{3}{8}$

What is the difference between the two methods?
Use your preferred method to calculate:

$$\frac{5}{8} - \frac{1}{8} \qquad \frac{9}{7} - \frac{4}{7} \qquad \frac{5}{3} - \frac{5}{3} \qquad 1 - \frac{2}{5}$$

Calculate:

$$\frac{3}{7} + \frac{5}{7} = \frac{\square}{\square} + \frac{4}{7} \qquad \frac{9}{5} - \frac{5}{5} = \frac{6}{5} - \frac{\square}{\square} \qquad \frac{2}{3} + \frac{\square}{\square} = \frac{11}{3} - \frac{4}{3}$$

Step 1	Step 2	Step 3

$$\frac{1}{3} + \frac{5}{6} + \frac{5}{12} = 1\frac{7}{12}$$
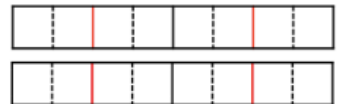
Explain each step of the calculation.
Use this method to help you add the fractions.
Give your answer as a mixed number.

$$\frac{2}{3} + \frac{1}{6} + \frac{7}{12} \qquad \frac{1}{4} + \frac{7}{8} + \frac{3}{16} \qquad \frac{1}{2} + \frac{5}{6} + \frac{5}{12}$$

Use the bar model to add the fractions. Record your answer as a mixed number.

$$\frac{3}{4} + \frac{3}{8} + \frac{1}{2} =$$

Draw your own models to solve:

$$\frac{5}{12} + \frac{1}{6} + \frac{1}{2} \qquad \frac{11}{20} + \frac{3}{5} + \frac{1}{10} \qquad \frac{3}{4} + \frac{5}{12} + \frac{1}{2}$$

23

How many different ways can you balance the equation?

$$\frac{5}{9} + \frac{\square}{9} = \frac{8}{9} + \frac{\square}{9}$$

Annie is adding three fractions.
She uses the model to help her.

What could her three fractions be?

How many different combinations can you find?

Can you write a number story to represent your calculation?

A chocolate bar has 12 equal pieces.

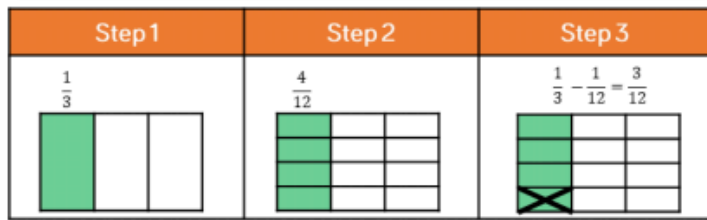Amir eats $\frac{5}{12}$ more of the bar than Whitney.

There is one twelfth of the bar remaining.

What fraction of the bar does Amir eat?

What fraction of the bar does Whitney eat?

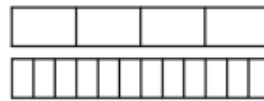# Fraction challenge questions- consolidation of learning

Subtracting Fractions

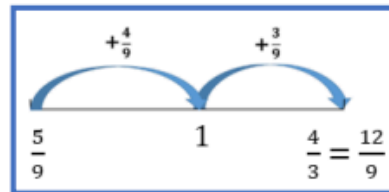| Step 1	Step 2	Step 3
$\frac{1}{3}$	$\frac{4}{12}$	$\frac{1}{3} - \frac{1}{12} = \frac{3}{12}$

Explain each step of the calculation.
Use this method to help you solve $\frac{5}{6} - \frac{1}{3}$ and $\frac{7}{8} - \frac{5}{16}$

Tommy and Teddy both have the same sized chocolate bar. Tommy has $\frac{3}{4}$ left, Teddy has $\frac{5}{12}$ left.
How much more does Tommy have?

Amir uses a number line to find the difference between $\frac{5}{9}$ and $\frac{4}{3}$

$+\frac{4}{9}$ $+\frac{3}{9}$

$\frac{5}{9}$ 1 $\frac{4}{3} = \frac{12}{9}$

Use this method to find the difference between:

$\frac{3}{4}$ and $\frac{5}{12}$ $\frac{19}{15}$ and $\frac{3}{5}$ $\frac{20}{9}$ and $\frac{4}{3}$

Which subtraction is the odd one out?

A $\frac{13}{4} - \frac{3}{8}$
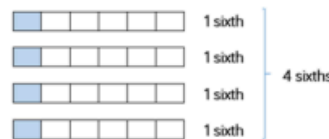
B $\frac{10}{3} - \frac{2}{9}$

C $\frac{23}{7} - \frac{1}{3}$

Explain why.

Multiplying Fractions

Work out $\frac{1}{6} \times 4$ by counting in sixths.

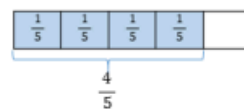$\frac{1}{6} \times 4 = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$

1 sixth
1 sixth   4 sixths
1 sixth
1 sixth

Use this method to work out:
$2 \times \frac{1}{3}$ $\frac{1}{5} \times 3$ $6 \times \frac{1}{10}$

Mo uses a single bar model to work out: $\frac{1}{5} \times 4 = \frac{4}{5}$
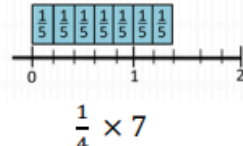
$\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$

$\frac{4}{5}$

Use this method to work out:
$\frac{1}{4} \times 3$ $6 \times \frac{1}{8}$ $\frac{1}{10} \times 8$

Eva uses a number line and repeated addition to work out
$\frac{1}{5} \times 7 = \frac{7}{5} = 1\frac{2}{5}$

$\frac{1}{5}\frac{1}{5}\frac{1}{5}\frac{1}{5}\frac{1}{5}\frac{1}{5}\frac{1}{5}$

0   1   2

Use this method to work out:
$5 \times \frac{1}{8}$ $\frac{1}{3} \times 3$ $\frac{1}{4} \times 7$

Amir is multiplying fractions by a whole number.

$\frac{1}{5} \times 5 = \frac{5}{25}$

Can you explain his mistake?

Always, sometimes, never?

When you multiply a unit fraction by the same number as it's denominator the answer will be one whole.