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The first page of a lesson is a maths problem. Don't look at the next page until you have had a go! The third and fourth pages give you practice, so you can check your understanding.



Adding fractions

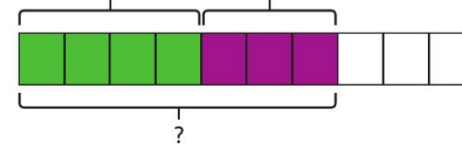
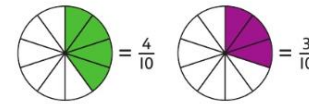
Discover



- a) Altogether, what fraction of pizza is left in the boxes?
- b) Use a number line to show your answer.

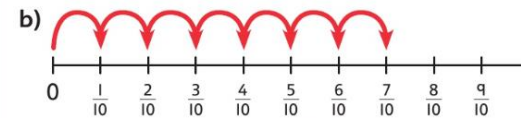
Share

- a) The first box has 4 tenths or $\frac{4}{10}$ of a pizza left.
The second box has 3 tenths or $\frac{3}{10}$ of a pizza left.

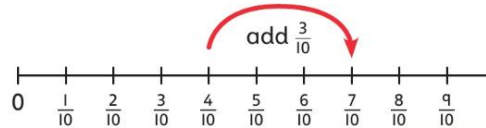


4 tenths + 3 tenths = 7 tenths

$\frac{4}{10} + \frac{3}{10} = \frac{7}{10}$ So, altogether $\frac{7}{10}$ of a pizza is left in the boxes.



I jumped $\frac{1}{10}$ at a time.



I started at $\frac{4}{10}$ and jumped $\frac{3}{10}$ in one go.

I wonder if you get the same result if you start with $\frac{3}{10}$ and add $\frac{4}{10}$.

Lesson 1

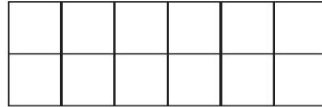
Adding fractions

1 Add these fractions. Colour in the shapes to help you.

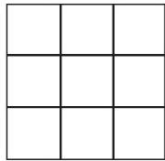
a) $\frac{4}{7} + \frac{2}{7} = \frac{\square}{\square}$



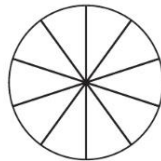
c) $\frac{7}{12} + \frac{1}{12} = \frac{\square}{\square}$



b) $\frac{2}{9} + \frac{3}{9} = \frac{\square}{\square}$

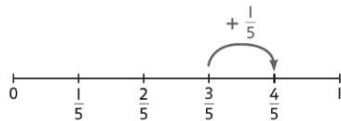


d) $\frac{5}{10} + \frac{5}{10} = \frac{\square}{\square}$

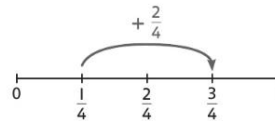


2 Add these fractions. Use the number lines to help you.

a) $\frac{3}{5} + \frac{1}{5} = \frac{\square}{\square}$



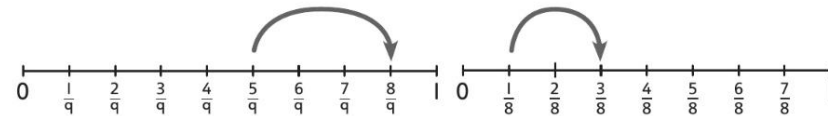
b) $\frac{1}{4} + \frac{2}{4} = \frac{\square}{\square}$



3 Complete the calculations that are shown on the number lines.

a) $\frac{5}{9} + \frac{\square}{\square} = \frac{\square}{\square}$

b) $\frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$



4 Add the fractions.

a) $\frac{1}{3} + \frac{1}{3} = \frac{\square}{\square}$

d) $\frac{\square}{\square} = \frac{2}{6} + \frac{2}{6}$

g) $\frac{3}{10} + \frac{5}{10} = \frac{\square}{\square}$

b) $\frac{2}{4} + \frac{2}{4} = \frac{\square}{\square}$

e) $\frac{1}{8} + \frac{3}{8} = \frac{\square}{\square}$

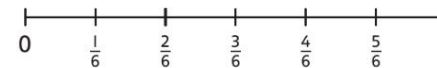
h) $\frac{3}{12} + \frac{9}{12} = \frac{\square}{\square}$

c) $\frac{3}{9} + \frac{2}{9} = \frac{\square}{\square}$

f) $\frac{3}{5} + \frac{1}{5} = \frac{\square}{\square}$

i) $\frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{\square}{\square}$

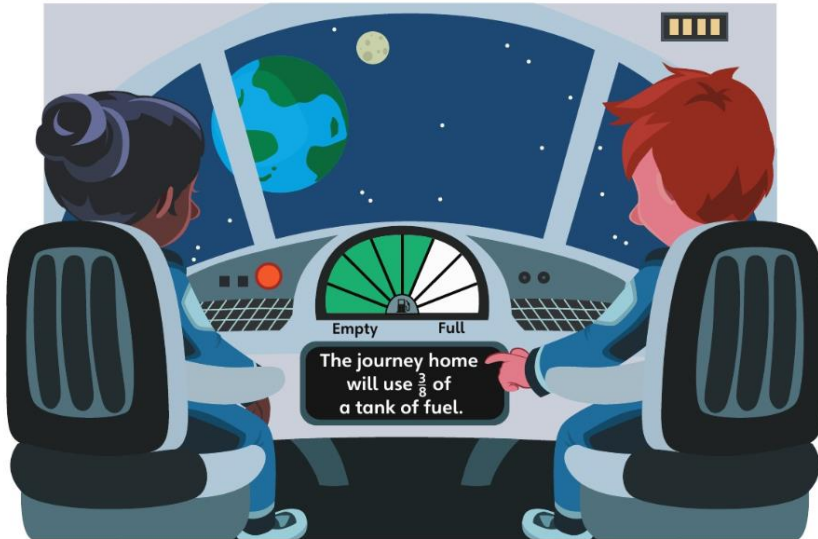
5 The sum of two fractions is $\frac{5}{6}$. What could the fractions be?





Subtracting fractions

Discover



- 1 a) How much fuel will be left after the journey home?
- b) If the fuel was full before the journey home, what would the answer be?

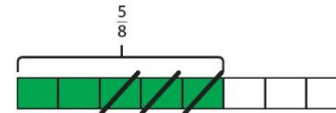
Share

- a) The fuel tank is $\frac{5}{8}$ full. The journey home will use $\frac{3}{8}$ of the fuel.

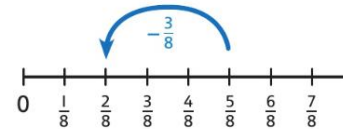


5 eighths – 3 eighths = 2 eighths

$$\frac{5}{8} - \frac{3}{8} = \frac{2}{8}$$



I drew a bar and shaded in $\frac{5}{8}$. Then I crossed out $\frac{3}{8}$.

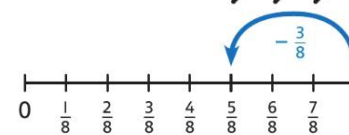
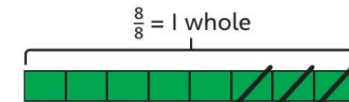
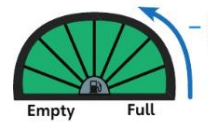


I jumped back $\frac{3}{8}$ on a number line.

There will be $\frac{2}{8}$ of the fuel left after the journey home.

- b) You start with $\frac{8}{8}$ and use $\frac{3}{8}$.

$$1 - \frac{3}{8} = \frac{8}{8} - \frac{3}{8} = \frac{5}{8}$$



If the fuel was full before the journey home, there would be $\frac{5}{8}$ of the fuel left after the journey home.

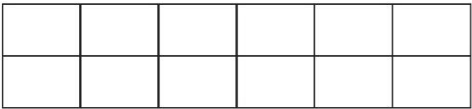
Lesson 2

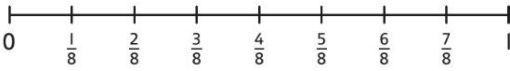
Subtracting fractions

1 Subtract the fractions. Cross out parts of the diagrams to help you.

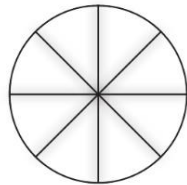
a) $\frac{7}{9} - \frac{3}{9} = \frac{\boxed{}}{\boxed{}}$ 

b) $\frac{7}{10} - \frac{5}{10} = \frac{\boxed{}}{\boxed{}}$ 

c) $\frac{11}{12} - \frac{5}{12} = \frac{\boxed{}}{\boxed{}}$ 


d) $1 - \frac{1}{8} = \frac{\boxed{}}{\boxed{}}$ 


2 Max cuts a cake into 8 slices. He eats 5 slices. What fraction of the cake does he have left?

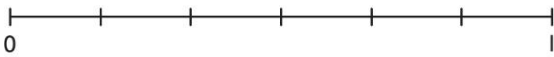


Max has $\frac{\boxed{}}{\boxed{}}$ of the cake left.

3 Use the number lines to subtract the fractions.

a) $1 - \frac{1}{3} = \frac{\boxed{}}{\boxed{}}$ 

b) $\frac{7}{8} - \frac{2}{8} = \frac{\boxed{}}{\boxed{}}$ 

c) $\frac{5}{6} - \frac{4}{6} = \frac{\boxed{}}{\boxed{}}$ 

4 Subtract to find the answers.

a) $\frac{5}{9} - \frac{2}{9} = \frac{\boxed{}}{\boxed{}}$ d) $\frac{\boxed{}}{\boxed{}} = \frac{3}{10} - \frac{1}{10}$ g) $\frac{5}{6} - \frac{\boxed{}}{\boxed{}} = \frac{1}{6}$

b) $\frac{3}{8} - \frac{2}{8} = \frac{\boxed{}}{\boxed{}}$ e) $\frac{10}{11} - \frac{\boxed{}}{11} = \frac{3}{11}$ h) $1 - \frac{\boxed{}}{\boxed{}} = \frac{1}{9}$

c) $1 - \frac{3}{4} = \frac{\boxed{}}{\boxed{}}$ f) $\frac{7}{8} - \frac{2}{\boxed{}} = \frac{5}{8}$ i) $\frac{8}{9} = 1 - \frac{\boxed{}}{\boxed{}}$

5 Two fractions have a difference of $\frac{3}{8}$.

Use the number line to find three pairs of fractions that have a difference of $\frac{3}{8}$.



Lesson 3

Making the whole

Discover



- 1 a) $\frac{1}{3}$ of the people on the boat are female.
What fraction of the people on the boat are male?
- b) What fraction of the iceberg is under the water?

Share

- a) $\frac{1}{3}$ of the people on the boat are female.

This is because 1 of the 3 people is female.



2 out of the 3 people on the boat are male.

This is written as $\frac{2}{3}$.

Two-thirds of the people on the boat are male.



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

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

If I add the two fractions together it will make 1 whole.



- b) The whole is split into 8 parts.

1 out of the 8 parts is above the water.

This is written as $\frac{1}{8}$.

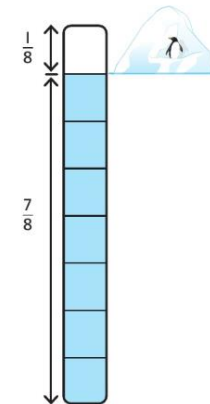
7 out of the 8 parts are under the water.

This is written as $\frac{7}{8}$.

$$\frac{1}{8} + \frac{7}{8} = \frac{8}{8}$$

$$\frac{1}{8} + \frac{7}{8} = 1 \text{ whole}$$

$\frac{7}{8}$ of the iceberg is under the water.



Lesson 3

Making the whole

1 Complete the missing information.

a) out of the 6 eggs are in the box.

This is $\frac{\text{}{\text{}}$ of the whole.

out of the 6 eggs have been used.

This is $\frac{\text{}{\text{}}$ of the whole.

$$\frac{\text{}}{\text{}} + \frac{\text{}}{\text{}} = 1$$

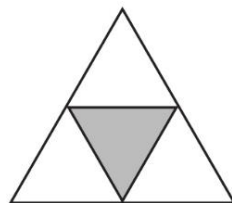
b) out of the parts is shaded.

This is $\frac{\text{}{\text{}}$ of the whole.

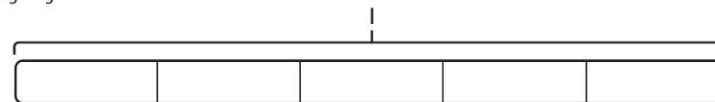
out of the parts are not shaded.

This is $\frac{\text{}{\text{}}$ of the whole.

$$\frac{\text{}}{\text{}} + \frac{\text{}}{\text{}} = 1$$

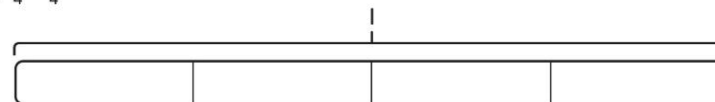


2 a) $\frac{3}{5} + \frac{2}{5} = 1$ whole



Use the bar model to show how you know this is true.

b) $\frac{1}{4} + \frac{3}{4} = 1$



Use the bar model to show how you know this is true.

3 Complete these number sentences.

a) $\frac{5}{8} + \frac{\text{}}{\text{}} = 1$

d) $\frac{7}{7} = \frac{3}{7} + \frac{\text{}}{\text{}}$

b) $\frac{\text{}}{\text{}} = \frac{2}{5} + \frac{3}{5}$

e) $1 = \frac{1}{6} + \frac{\text{}}{\text{}}$

c) $\frac{\text{}}{\text{}} + \frac{1}{9} = \frac{9}{9}$

f) $\frac{4}{9} + \frac{\text{}}{\text{}} = 1$

4 In a group, $\frac{4}{7}$ of the children are sitting down.

What fraction of the group are standing up?

$\frac{\text{}}{\text{}}$ of the group are standing up.

Solving problems – adding and subtracting fractions

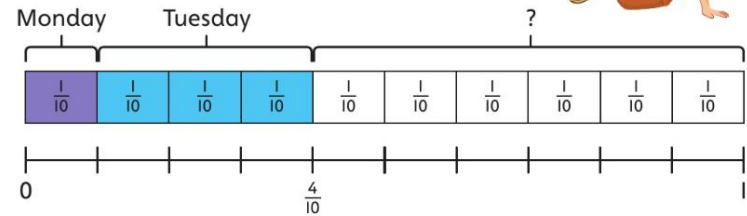
Discover



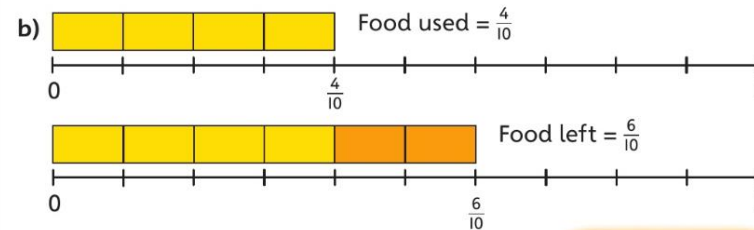
- 1 a) What fraction of the food is left in the box?
 b) Has more food been used or left in the box? How much more?

Share

- a) I will start by working out the food used on Monday and Tuesday.



$\frac{1}{10} + \frac{3}{10} = \frac{4}{10}$, so $\frac{4}{10}$ of the food has been used.
 $1 - \frac{4}{10} = \frac{6}{10}$, so $\frac{6}{10}$ of the food is left in the box.



More of the food is left than has been used.

$$\frac{6}{10} - \frac{4}{10} = \frac{2}{10}$$

$\frac{2}{10}$ more of the food is left in the box than has been used.

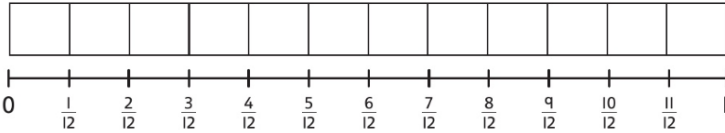
I used a number line to work out the difference.



Lesson 4

Solving problems – adding and subtracting fractions

- 1 Amy has a box of cupcakes. $\frac{1}{12}$ of the cupcakes are chocolate. $\frac{3}{12}$ of them are strawberry. The rest are vanilla.



- a) What fraction of the cupcakes are chocolate or strawberry?

$\frac{\square}{\square}$ of the cupcakes are chocolate or strawberry.

- b) What fraction of the cupcakes are vanilla?

$\frac{\square}{\square}$ of the cupcakes are vanilla.

- c) Were there more vanilla cupcakes or chocolate cupcakes? What fraction more?

Vanilla

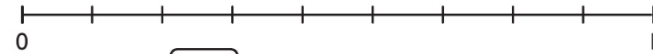
Chocolate

There were more _____ cupcakes.

There were $\frac{\square}{\square}$ more _____ cupcakes.

- 2 Emma is on holiday for 9 days. It snows for $\frac{4}{9}$ of the holiday and is windy for the rest of the holiday.

- a) What fraction of the holiday is windy?



It is windy for $\frac{\square}{\square}$ of Emma's holiday.

- b) Is it windy for a greater amount of the holiday or is it snowy for a greater amount? How do you know?

It is _____ for a greater amount of the holiday because

- 3 The answer to a question is $\frac{3}{10}$.

- a) What fractions can you add to get the answer $\frac{3}{10}$?

$$\frac{\square}{\square} + \frac{\square}{\square} = \frac{3}{10}$$

$$\frac{\square}{\square} + \frac{\square}{\square} = \frac{3}{10}$$

- b) What fractions can you subtract to get the answer $\frac{3}{10}$?

$$\frac{\square}{\square} - \frac{\square}{\square} = \frac{3}{10}$$

$$\frac{\square}{\square} - \frac{\square}{\square} = \frac{3}{10}$$

- c) What fractions can you add, and then subtract, to get the answer $\frac{3}{10}$?

$$\frac{\square}{\square} + \frac{\square}{\square} - \frac{\square}{\square} = \frac{3}{10}$$

$$\frac{\square}{\square} + \frac{\square}{\square} - \frac{\square}{\square} = \frac{3}{10}$$