Simplify fractions

1

1									
$\frac{1}{2}$					$\frac{1}{2}$				
$\frac{1}{3}$			$\frac{1}{3}$			$\frac{1}{3}$			
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$			$\frac{1}{4}$		
$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$	
$\frac{1}{6}$		$\frac{1}{6}$	$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$	$\frac{1}{6}$	
$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$		$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$		
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$		
$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$

Use the fraction wall to write each fraction in its simplest form.

a) $\frac{4}{6} = $ ⬚

b) $\frac{8}{10} = $ ⬚

c) $\frac{6}{8} = $ ⬚

d) $\frac{4}{8} = $ ⬚

2 a) Use a fraction wall to explain why $\frac{7}{10}$ does not simplify.
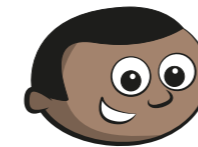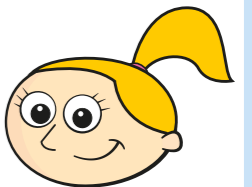
_____

_____

b) Find three more fractions on the fraction wall that cannot be simplified.

⬚   ⬚   ⬚

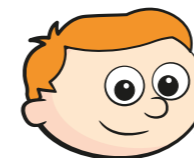**3** Mo, Eva and Ron are trying to simplify $\frac{5}{20}$

Mo: I can't simplify this because one number is odd and the other is even.

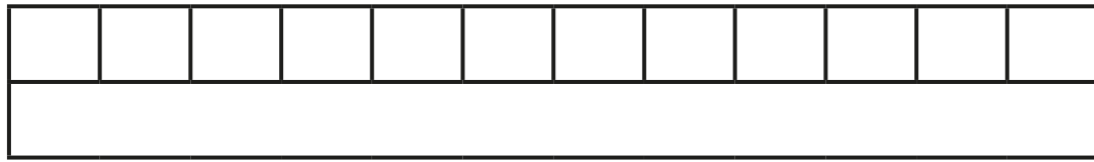Eva: I can't simplify this because only one number can be halved.

Ron: I can simplify any fraction.

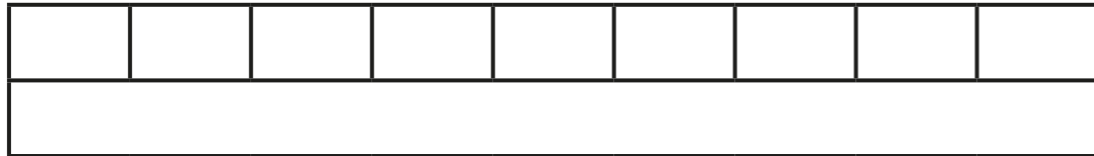Do you fully agree, partly agree or completely disagree with each person?

Talk to a partner.

4 **a)** Draw lines on the bar model to show that $\frac{9}{12}$ is equal to $\frac{3}{4}$

[bar model divided into 12 equal parts]

[empty bar]

b) Complete each bar model and calculation.

[bar model divided into 9 parts]

[empty bar]

$\boxed{} = \frac{3}{9}$

[empty bar]

[empty bar]

$\boxed{} = \frac{5}{15}$

5 Simplify the fractions.

a) $\frac{4}{12} = \boxed{}$ **b)** $\frac{8}{12} = \boxed{}$ **c)** $\frac{40}{120} = \boxed{}$ **d)** $\frac{12}{4} = \boxed{}$

$\frac{4}{16} = \boxed{}$ $\frac{8}{16} = \boxed{}$ $\frac{40}{160} = \boxed{}$ $\frac{120}{4} = \boxed{}$

$\frac{4}{20} = \boxed{}$ $\frac{8}{20} = \boxed{}$ $\frac{40}{200} = \boxed{}$ $\frac{12}{400} = \boxed{}$

Describe and explain any patterns that you noticed.

_____

_____

6 Write 3 fractions that simplify to $\frac{3}{5}$

[box]   [box]   [box]

7 Teddy and Dora are both simplifying $\frac{30}{42}$

Teddy

$\frac{30}{42} = \frac{15}{21} = \frac{5}{7}$

Dora

$\frac{30}{42} = \frac{5}{7}$

a) How do you think Dora was able to simplify the fraction in one step?

b) Simplify these fractions in one step.

$\frac{24}{30} = \boxed{}$ $\frac{16}{20} = \boxed{}$

$\frac{56}{64} = \boxed{}$ $\frac{99}{121} = \boxed{}$

8 $\dfrac{\bigstar}{\heartsuit}$ $\bigstar$ is a prime number. $\heartsuit$ is a multiple of 10

The fraction can be simplified.

What could each number be? Explain your reasoning.

_____

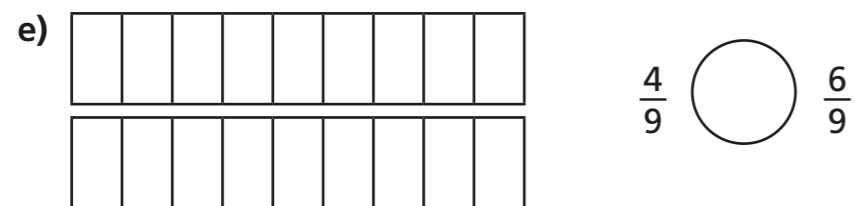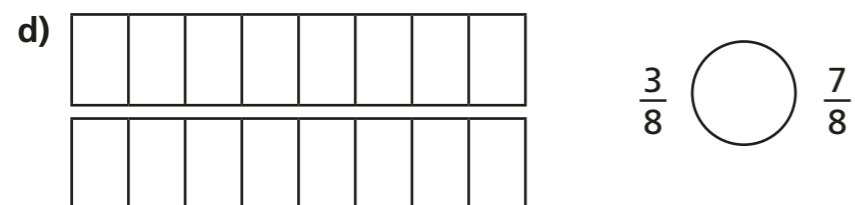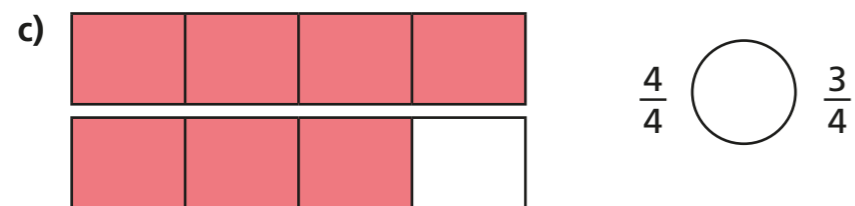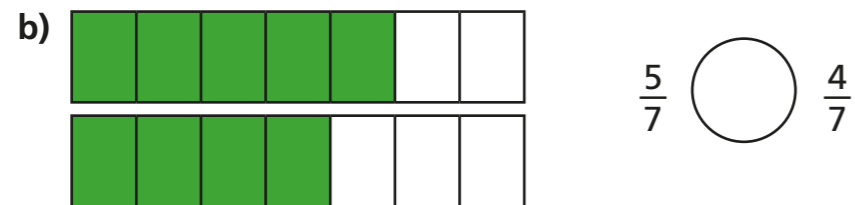_____

_____

_____

Compare and order (denominator)

1 Write <, > or = to compare the fractions.

Use the bar models to help you.

a)

$\frac{1}{5}$ ◯ $\frac{3}{5}$

b)

$\frac{5}{7}$ ◯ $\frac{4}{7}$

c)

$\frac{4}{4}$ ◯ $\frac{3}{4}$

d)

$\frac{3}{8}$ ◯ $\frac{7}{8}$

e)

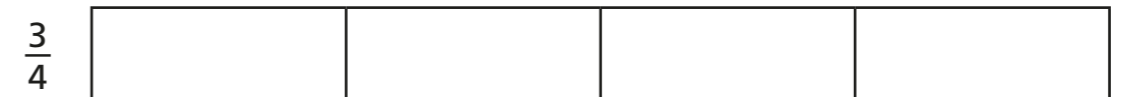$\frac{4}{9}$ ◯ $\frac{6}{9}$
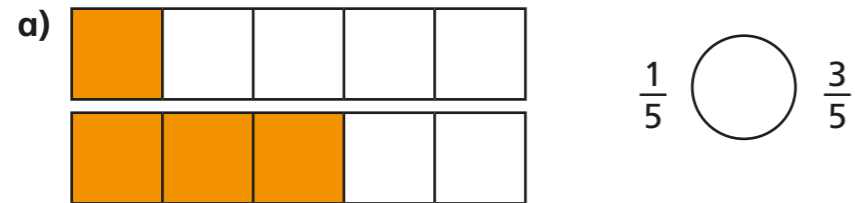
f) What do you notice about your answers?

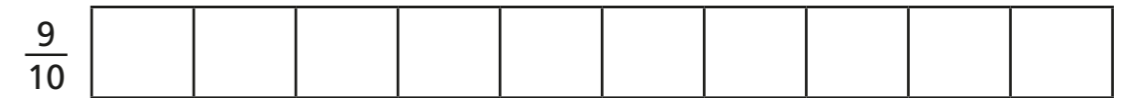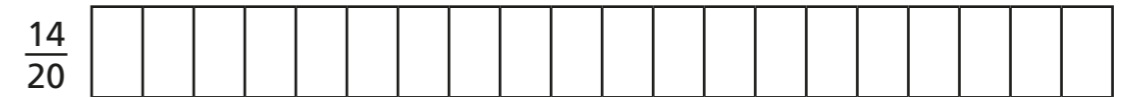**g)** Complete the sentence.
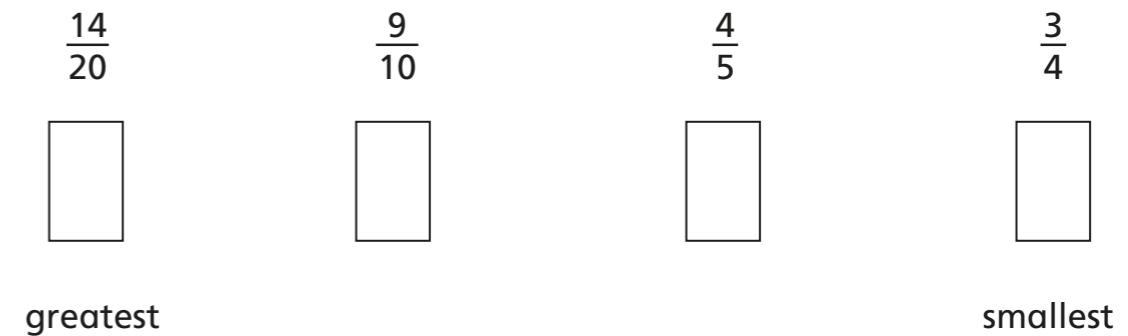
When the denominators are the same, the _____

the numerator, the _____ the fraction.

2 **a)** Colour the bar models to show the fractions.

$\frac{14}{20}$

$\frac{9}{10}$

$\frac{4}{5}$

$\frac{3}{4}$

b) Use the bar models to sort these fractions in order from greatest to smallest.

$\frac{14}{20}$ $\frac{9}{10}$ $\frac{4}{5}$ $\frac{3}{4}$

☐   ☐   ☐   ☐

greatest   smallest

c) Order the fractions from smallest to greatest.

$\frac{7}{10}$ $\frac{1}{2}$ $\frac{2}{5}$ $\frac{3}{10}$

☐   ☐   ☐   ☐

smallest   greatest
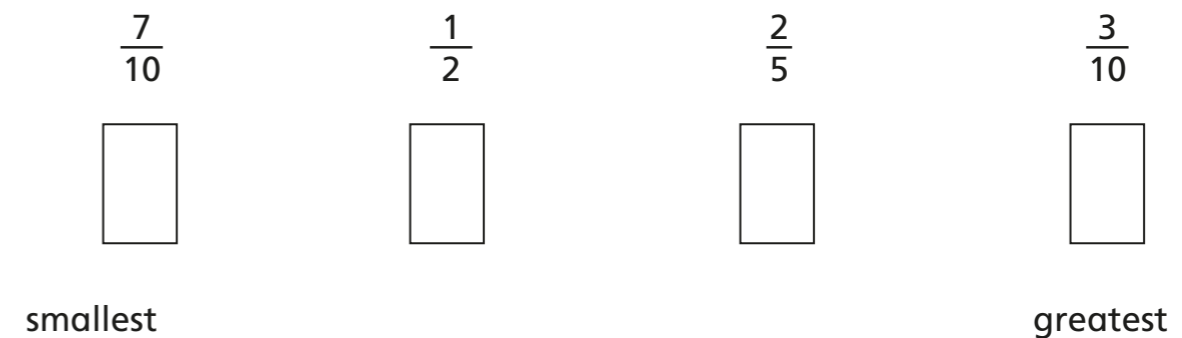
3 Amir is comparing the fractions $\frac{4}{15}$ and $\frac{3}{10}$

$$\frac{4}{15} = \frac{8}{30} \qquad \frac{3}{10} = \frac{9}{30}$$

$\frac{9}{30}$ is greater than $\frac{8}{30}$

$\frac{3}{10}$ is greater than $\frac{4}{15}$
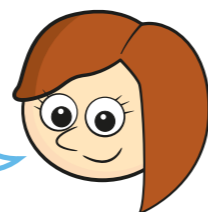
Explain Amir's method.

_____

_____

_____

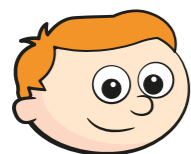**4** Ron and Rosie are practising penalties.

Ron scored 7 out of 10.

Rosie scored 23 out of 30

I scored more than you, so I should take penalties for the school team.

I did not miss as many as you, so I should take the penalties.

Compare fractions to explain who should take penalties for the school team.

_____

_____

5 Write <, > or = to compare the fractions.

a) $\frac{3}{4}$ ◯ $\frac{5}{6}$ d) $\frac{3}{5}$ ◯ $\frac{5}{7}$

b) $\frac{2}{3}$ ◯ $\frac{5}{9}$ e) $\frac{9}{10}$ ◯ $\frac{3}{4}$

c) $\frac{2}{3}$ ◯ $\frac{7}{8}$ f) $\frac{9}{10}$ ◯ $\frac{19}{20}$

6 Annie, Tommy and Kim are making flags for the school fair.

Annie has completed $3\frac{3}{4}$ flags, Tommy has completed $3\frac{2}{3}$ flags and Kim has completed $\frac{18}{5}$ flags.

Who has completed the most flags?

_____

Compare and order (numerator)

1 Use strips of paper to represent the fractions and complete the sentences.

a) $\frac{1}{3}$, $\frac{1}{5}$ and $\frac{1}{6}$

The smallest fraction is ☐   The greatest fraction is ☐

b) $\frac{2}{3}$, $\frac{2}{5}$ and $\frac{2}{6}$

The smallest fraction is ☐   The greatest fraction is ☐

c) $\frac{3}{3}$, $\frac{3}{5}$ and $\frac{3}{6}$

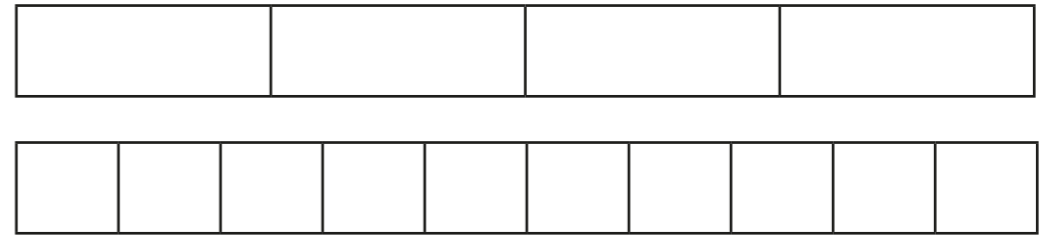The smallest fraction is ☐   The greatest fraction is ☐

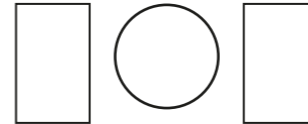**d)** What do you notice about your answers?

e) Complete the sentence.

When the _____ are the same, the _____

the denominator, the _____ the fraction.

2 **a)** Colour the bar models to compare $\frac{3}{4}$ and $\frac{6}{10}$

b) Write <, > or = to complete the statement.

☐ ◯ ☐

3 Which is the greatest fraction? Circle your answer.

$\frac{3}{100}$ $\frac{3}{1000}$ $\frac{3}{500}$

How do you know?

4 Write < or > to compare the fractions.

a) $\frac{1}{7}$ ◯ $\frac{1}{9}$ **d)** $\frac{11}{12}$ ◯ $\frac{11}{11}$

b) $\frac{4}{5}$ ◯ $\frac{4}{7}$ **e)** $\frac{19}{5}$ ◯ $\frac{19}{6}$

c) $\frac{3}{13}$ ◯ $\frac{3}{8}$ **f)** $\frac{107}{53}$ ◯ $\frac{107}{40}$

5 Explain how can you compare $\frac{2}{3}$ and $\frac{4}{5}$ using the same numerator rule.

_____

_____

_____

Complete the sentence to compare $\frac{2}{3}$ and $\frac{4}{5}$

[ ] is greater than [ ]

6 Scott scored 20 out of 24 in a game.

Dani scored 5 out of 7

Compare their scores.

Explain who you think did best and why.

_____

_____

_____

7 Write <, > or = to complete each statement.

a) $\frac{2}{5}$ ◯ $1\frac{1}{3}$

b) $\frac{2}{5}$ ◯ $\frac{6}{11}$

c) $3\frac{2}{3}$ ◯ $\frac{11}{4}$

$1\frac{2}{5}$ ◯ $\frac{1}{3}$

$1\frac{2}{5}$ ◯ $3\frac{6}{11}$

$11\frac{2}{9}$ ◯ $\frac{101}{3}$

$1\frac{2}{5}$ ◯ $1\frac{1}{3}$

$3\frac{2}{5}$ ◯ $3\frac{6}{11}$

$11\frac{1}{9}$ ◯ $\frac{100}{8}$

$\frac{12}{5}$ ◯ $\frac{12}{3}$

$\frac{12}{5}$ ◯ $\frac{36}{11}$

$27\frac{3}{4}$ ◯ $\frac{111}{3}$

8 Explain how you know when it is best to compare the numerators or denominators of two fractions.
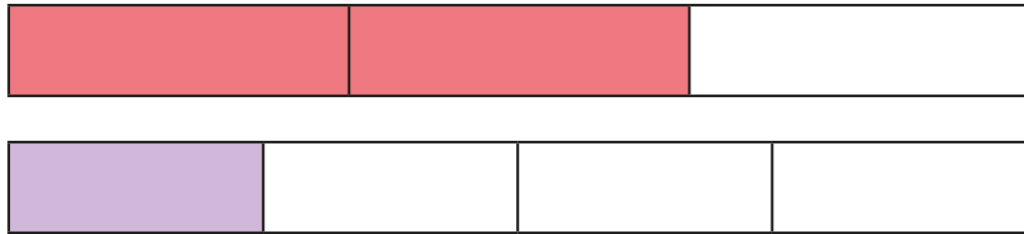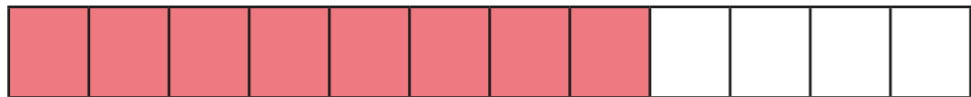
_____

_____

_____

Add and subtract fractions (2)

1 Amir is using fraction strips to work out $\frac{2}{3} + \frac{1}{4}$

Amir says he needs to find a common denominator.

a) Complete Amir's method.

$\frac{2}{3} = \frac{\square}{12}$

$\frac{1}{4} = \frac{\square}{12}$

$\frac{2}{3} + \frac{1}{4} = \frac{\square}{12} + \frac{\square}{12} = \frac{\square}{12}$

b) Show the addition on the fraction strip.

c) Could you have used a different denominator?

2 What common denominator can you use to add the fractions?

a) $\frac{2}{5} + \frac{1}{2}$ Common denominator = ☐

b) $\frac{2}{3} + \frac{4}{5}$ Common denominator = ☐

c) $\frac{7}{8} - \frac{1}{4}$ Common denominator = ☐

d) $\frac{7}{9} - \frac{1}{6}$ Common denominator = ☐

e) $\frac{11}{15} + \frac{3}{10}$ Common denominator = ☐

3 Ron and Eva are working out $\frac{1}{4} + \frac{5}{6}$

Ron's method

$\frac{1}{4} + \frac{5}{6} = \frac{3}{12} + \frac{10}{12} = \frac{13}{12}$

Eva's method

$\frac{1}{4} + \frac{5}{6} = \frac{6}{24} + \frac{20}{24} = \frac{26}{24}$

a) What is the same about Ron's and Eva's methods?

_____

_____

b) What is different about their methods?

_____

_____

c) Which method do you prefer? Why?

4 Complete the calculations.
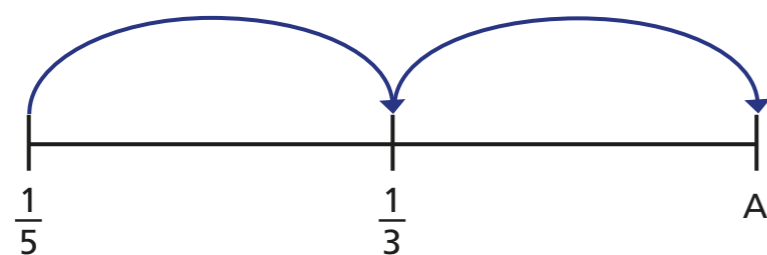
a) $\dfrac{1}{5} + \dfrac{3}{4} = \boxed{}$

c) $\dfrac{1}{2} - \dfrac{1}{7} = \boxed{}$

b) $\dfrac{7}{8} - \dfrac{1}{3} = \boxed{}$

d) $\dfrac{11}{18} + \dfrac{7}{12} = \boxed{}$

5 Mo is drawing jumps on a number line.

The jumps are the same size.

a) What is the size of the jump?

$\boxed{}$

b) What is the value of A?

$\boxed{}$

6 Complete the bar model.
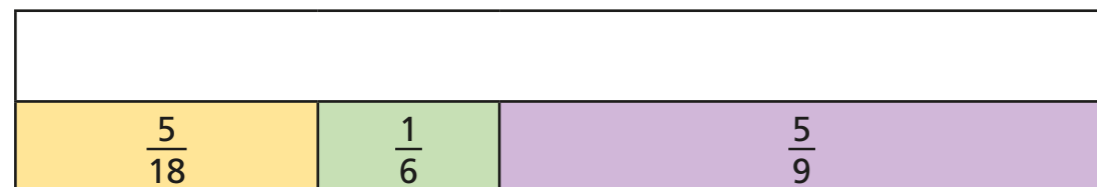
7 Complete the additions.

Give your answers as mixed numbers and as improper fractions.

a) $\dfrac{4}{5} + \dfrac{5}{4} = \boxed{} = \boxed{}$

c) $\dfrac{9}{8} + \dfrac{8}{9} = \boxed{} = \boxed{}$

b) $\dfrac{2}{3} + \dfrac{3}{2} = \boxed{} = \boxed{}$

d) $\boxed{} = \boxed{} = \dfrac{5}{3} + \dfrac{3}{5}$

What patterns do you notice?

8 Look at these additions.

$\dfrac{1}{2} + \dfrac{1}{3} = \boxed{}$ 　 $\dfrac{1}{2} + \dfrac{1}{3} + \dfrac{1}{4} = \boxed{}$ 　 $\dfrac{1}{2} + \dfrac{1}{3} + \dfrac{1}{4} + \dfrac{1}{5} = \boxed{}$

a) When does this pattern first give an answer greater than 2?

_____

_____

b) Do you think the pattern will ever give an answer greater than 100?

Mixed addition and subtraction

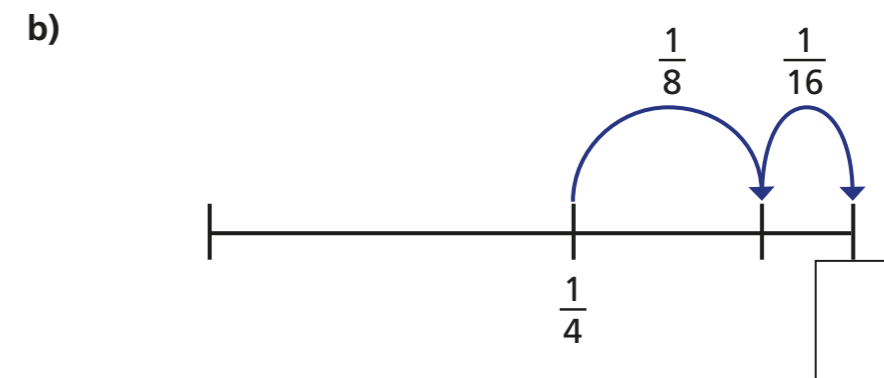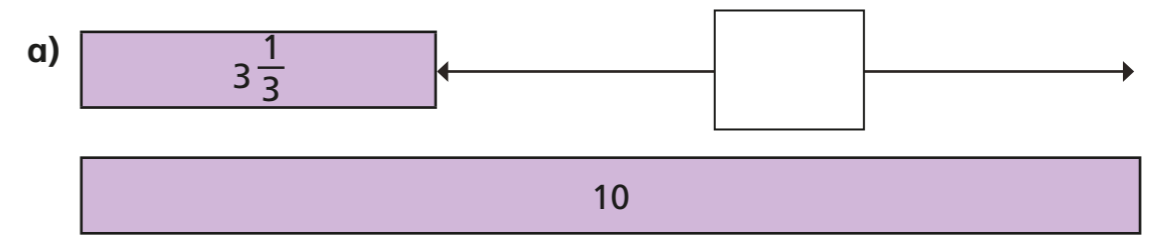**1** Work out the calculations.

a) $\dfrac{2}{5} + \dfrac{3}{4} = \boxed{}$

b) $2\dfrac{1}{4} - \dfrac{2}{3} = \boxed{}$

c) $3\dfrac{7}{10} - 2\dfrac{1}{4} = \boxed{}$

2 Complete the calculation.

$$\dfrac{5}{6} + 1\dfrac{2}{9} - \dfrac{1}{2} = \boxed{}$$

3 Work out the missing fractions.

a)

| $3\dfrac{1}{3}$ | $\longleftarrow$ $\boxed{}$ $\longrightarrow$ |

| 10 |

b)

4 Complete the calculations.

a) $\dfrac{2}{5} + \dfrac{1}{5} + \boxed{} = 1$

b) $\dfrac{2}{5} + \dfrac{1}{5} + \boxed{} = 1\dfrac{1}{2}$

c) $\dfrac{2}{5} + \dfrac{1}{5} + \boxed{} = \dfrac{4}{3}$

d) $\dfrac{4}{5} = \boxed{} - \dfrac{4}{5}$

5 Which of these are true and which are false?

Can you decide without having to do the additions or the subtractions?
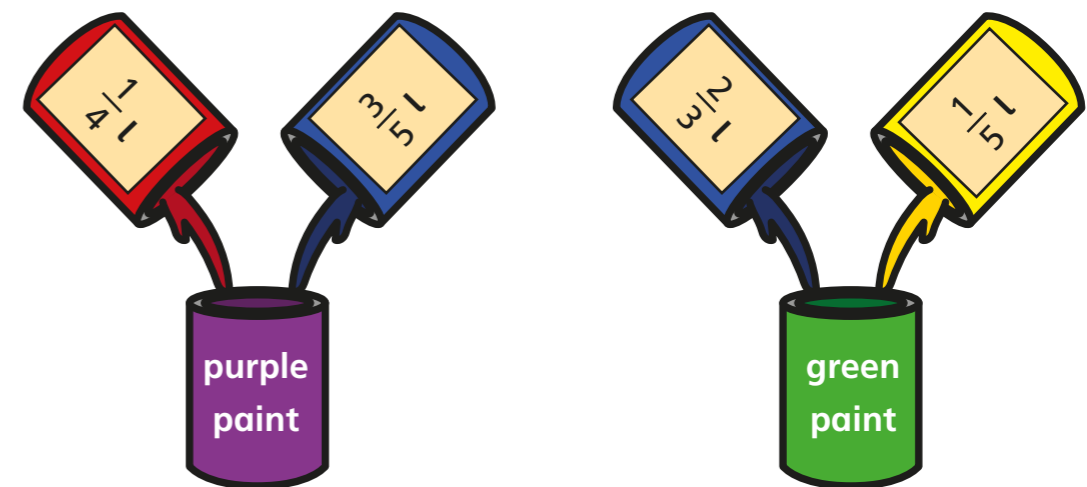
Talk about your reasons with a partner.

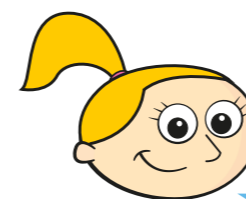|	True or false?
$2\frac{1}{3} + 3\frac{3}{4}$ is equal to $3\frac{1}{3} + 2\frac{3}{4}$	
$3\frac{3}{4} - \frac{1}{3}$ is less than $4\frac{3}{4} - 1\frac{1}{3}$	
$3\frac{3}{4} - 2\frac{1}{3}$ is equal to $3\frac{1}{3} - 2\frac{3}{4}$	

6 Complete the addition grid.

$1\frac{1}{4}$		$\frac{1}{4}$	$= 3\frac{3}{5}$
$\frac{1}{25}$	$1\frac{3}{20}$		$= 3\frac{39}{100}$
	$1\frac{1}{50}$	$1\frac{3}{100}$	$= 5\frac{9}{20}$
$=$	$=$	$=$	

7 A painter uses the following mixtures.

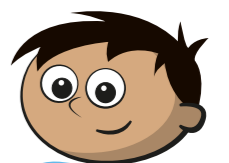How much more green paint does she have than purple paint?

8 Eva and Amir are working out this calculation.

$$\frac{1}{4} + \frac{25}{100} - \frac{2}{8} - \frac{9}{36}$$

This is going to be very difficult, because I can't find a common denominator.

I have found an easier way.

Find Amir's solution. Explain how this calculation can be solved.

_____

_____

_____

_____

About This Resource

This resource is aimed at Year 6 Secure and has been designed to give children the opportunity to consolidate the skills they have learned in Autumn Block 3 Fractions.

The questions are based on a selection of the same 'small steps' that are addressed in the block, but are presented in a different way so children can work through the pack independently and demonstrate their understanding and skills.

Small Steps

Simply Fractions
Fractions on a number line
Compare and order fractions by denominator
Compare and order fractions by numerator
Add and subtract fractions
Mixed addition and subtraction problems
Multiply fractions by a whole number
Divide fraction by a whole number
Four rules with fractions
Fraction of an amount
Fraction of an amount – find the whole

National Curriculum Objectives

Mathematics Year 6: Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
Mathematics Year 6: Compare and order fractions, including fractions > 1
Mathematics Year 6: Generate and describe linear number sequences (with fractions)
Mathematics Year 6: Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
Mathematics Year 6: Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $1/4 \times 1/2 = 1/8$]
Mathematics Year 6: Divide proper fractions by whole numbers [for example, $1/3 \div 2 = 1/6$]
Mathematics Year 6: Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]
Mathematics Year 6: Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Did you like this resource? Don't forget to review it on our website.

classroomsecrets.com

# Reasoning and Problem Solving – Fractions Consolidation – Year 6

The school have had a large donation of money to renovate an empty classroom. School Council decided it should be a Year 6 Common Room; somewhere for the year 6 children to relax and enjoy each other's company on wet breaks, and for after school clubs. There is a rumour, if it is done well, there might even be a youth club opening with a DJ booked every Friday night!

You and some friends have volunteered to help out, who knew there were so many maths calculations involved in decorating?
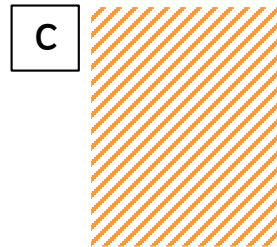
1. You need a consensus to agree the decorating plans and each year 6 class takes a vote. The results are given in fractions below:
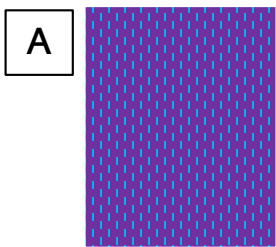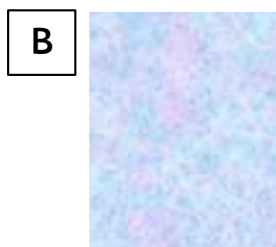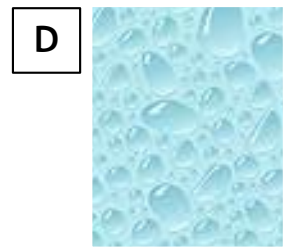
A $\dfrac{10}{30}$ B $\dfrac{2}{30}$ C $\dfrac{6}{30}$ D $\dfrac{12}{30}$

Which wallpaper wins the votes?

2. There are 3 walls to paint, each wall needs $\dfrac{4}{5}$ of a pot of paint to give it two coats. A parent has donated 4 paint pots from her garage, each pot is $\dfrac{3}{4}$ full.
Will this be enough paint to finish the painting? Explain your answer.

classroomsecrets.com

3. You and your friends have lots to do and have made lists to make sure nothing is forgotten! Look at the lists below. Write the fraction of jobs still to do below each list.

Joe
~~Clean walls~~
~~Buy brushes~~
~~Cover floors~~
Get pots
Paint walls
Buy ribbon

Kayla
~~Buy paste~~
~~Get tables~~
Choose chairs
Meet teachers
Find DJ

Jemima
~~Clear cupboards~~
~~Take to charity~~
~~Plan party~~
~~Buy material~~
~~Make curtains~~
~~Hang curtains~~
Make treats

$$\frac{\square}{\square} \qquad \frac{\square}{\square} \qquad \frac{\square}{\square}$$

Who has the biggest fraction of their work still to do?

4. There are two windows in the room that need curtains. The first needs $\frac{3}{5}$ of a metre, the second needs $\frac{8}{10}$ of a metre. Tick the box on the ruler which shows the two places where you would need to cut the fabric.

$\square\square\square \quad \square \quad \square \quad \square\square\square \quad \square\square\square \quad \square$

1 metre ruler

5. The carpet layer has sent his bill, he spent $2\frac{5}{10}$ hours cutting the carpet and laying the grippers and $4\frac{2}{3}$ hours laying the carpet.
He has charged the school for 7 hours 15 mins is the charge correct?
Explain your answer.

6. Now the carpet is down the furniture has to be ordered! There needs to be 4 chairs along one wall. The chairs measure $\frac{1}{3}$ of a metre in width and need $\frac{1}{2}$ of a metre between each chair to fit a table.

Will they fit on a wall measuring $3\frac{4}{6}$ metres? Explain your answer.

You have material $2\frac{1}{2}$ metres long and to cover the seats of 5 chairs, will you have enough fabric for each chair to have at least $\frac{1}{3}$ a metre of fabric? Explain your answer.

7. You have spent $\frac{3}{4}$ of your budget which was originally £160, how much is left for other decorations?

classroomsecrets.com

8. You have ordered a 24kg bag of flour for making buns for the opening ceremony, Jamal used $\frac{3}{8}$ of it for making biscuits do you have enough left for your recipe which needs 4kg of flour? Explain your answer.

9. Your buns were a hit! You made 40, but when you left them in the kitchen, the workers ate $\frac{3}{5}$ of them, how many are left?

10. You sent out 56 invites to your opening. 19 said they couldn't come, 5 said they were already busy and 32 are planning to attend. What fraction of your original guest list are coming (in simplest form)?

1. D

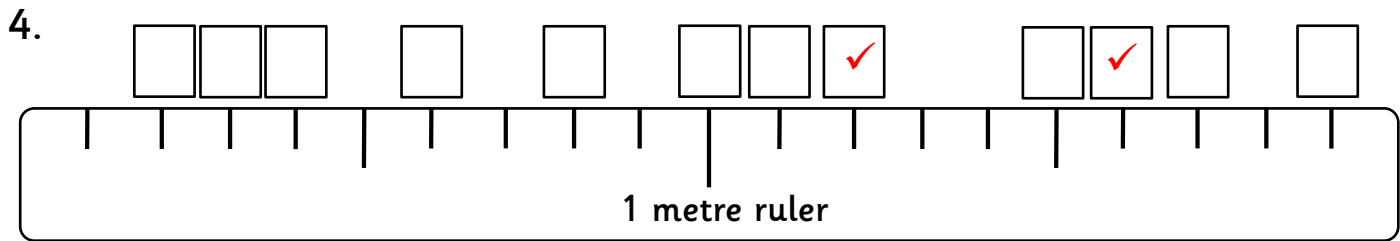2. Yes. $3 \times \frac{4}{5} = 2\frac{4}{5}$ required. 4 paint pots that are $\frac{3}{4}$ full = 3 pots

3.

$\frac{3}{6}$	$\frac{3}{5}$	$\frac{1}{7}$

Kayla has the most to do.

Joe: $\frac{105}{210}$ Kayla: $\frac{126}{210}$ Jemima: $\frac{30}{210}$

4.

1 metre ruler

5. The quote is 5 minutes too much. The carpet layer worked $7\frac{1}{6}$ hours in total which is 7 hours 10 mins. $4\frac{2}{3} + 2\frac{5}{10}$:

$4 + 2 = 6$; $\frac{2}{3} + \frac{5}{10} = \frac{20}{30} + \frac{15}{30} = \frac{35}{30} = \frac{7}{6} = 1\frac{1}{6}$; $6 + 1 + \frac{1}{6} = 7\frac{1}{6}$

6. The chairs and tables will fit. The chairs take up $1\frac{1}{3}$ metres, the table space needed is $1\frac{1}{2}$. This is $2\frac{5}{6}$ altogether so less than the space available.

There is enough material: $\frac{1}{3} \times 5 = 1\frac{2}{3}$

7. £40. 160 divided by 4 = 40. 40 x 3 = 120. 160 – 120 = 40

8. Jamal used 9kg (24kg divided by 8 = 3, 3 x 3 = 9kg), leaving 15kg (24kg – 9kg = 15kg), so there is enough to make the buns.

9. 16 buns left (40 divided by 5 = 8. 8 x 3 = 24. 40 – 24 = 16)

10. 19 + 5 = 24 are not attending.
32 are attending $= \frac{32}{56}$
32 divided by 8 = 4
56 divided by 8 = 7
$= \frac{4}{7}$