

Decimals up to 2 d.p.

- 1 What number is represented on the place value chart?

Ones	Tenths	Hundredths
	0.1 0.1	0.01 0.01 0.01
0	2	3

Complete the sentences.

There are ones, tenths and hundredths.

The number is .

- 2 Represent these numbers on a place value chart.

Complete the sentences.

- a) 0.56

There are ones, tenths and hundredths.

- b) 0.08

There are ones, tenths and hundredths.

- c) 1.48

There is one, tenths and hundredths.

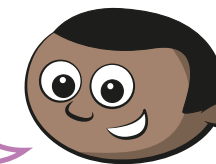
- d) 2.07

There are ones, tenths and hundredths.



- 3 Mo is thinking about tenths and hundredths.

In the number 2.49
the digit 4 represents
4 tenths or 0.4



What is the value of the digit 4 in each of these numbers?

a) 14.8 _____ d) 42.03 _____

b) 13.74 _____ e) 106.48 _____

c) 8.04 _____ f) 176.4 _____

- 4 a) Circle the number that has 5 in the tenths position.

53

5.3

0.53

0.35

- b) Write three numbers that have 3 in the hundredths position.

- 5 Complete the calculations.

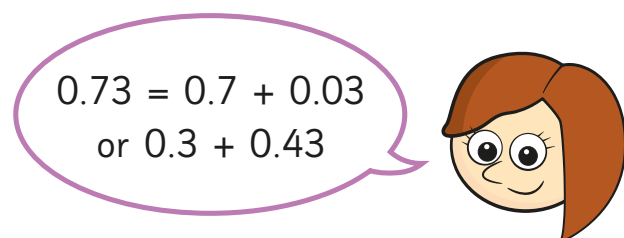
a) $0.64 = 0.6 + \boxed{}$

c) $0.3 + 0.05 = \boxed{}$

b) $0.53 = 0.5 + \boxed{}$

d) $0.06 + 0.8 = \boxed{}$

- 6 Rosie is finding different ways to partition 0.73

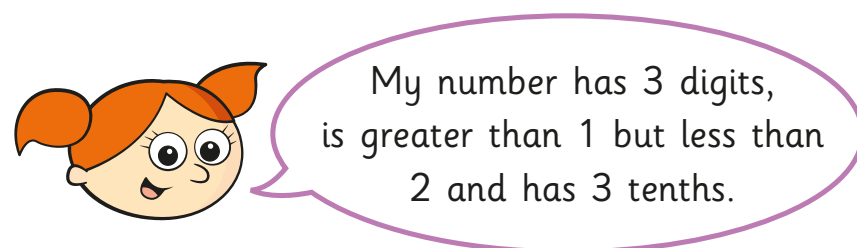


Ones	Tenths	Hundredths
0	7	3

In what other ways can 0.73 be partitioned?

List as many ways as you can below.

- 7 Alex is thinking of a number.



- a) What number could Alex be thinking of?

Talk about it with a partner.

- b) Write all the possible numbers Alex could be thinking of.

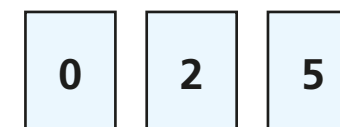
- c) Write another clue that would mean Alex's number is 1.34



- 8 Match the words to the numerals.

5 ones, 6 tenths and 5 hundredths	0.56
5 tenths and 6 hundredths	60.05
5 ones, 5 tenths and 6 hundredths	5.56
6 tens and 5 hundredths	5.65

- 9 Annie has three digit cards.



Are the statements true or false? Explain your answers.

- a) The largest number Annie can make is 5.02

- b) The smallest number Annie can make is 0.25

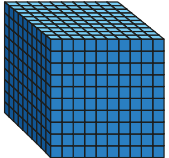
- c) Annie can make six different numbers.



Understand thousandths



1 Tommy is using base 10 to represent decimals.

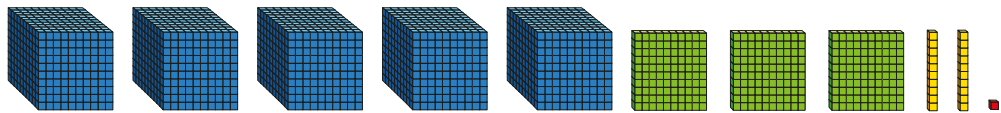
He uses  to represent 1 whole.

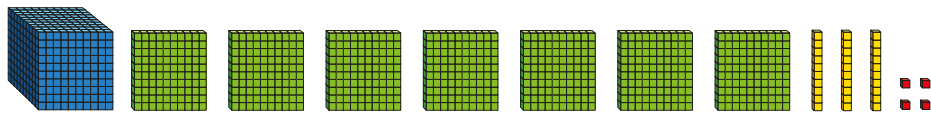
He uses  to represent $\frac{1}{10}$ or 0.1

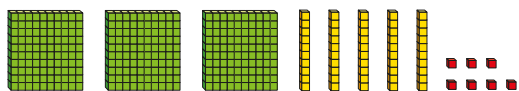
He uses  to represent $\frac{1}{100}$ or 0.01

He uses  to represent $\frac{1}{1000}$ or 0.001

What decimals are represented?

a) 

b) 

c) 

2 a) Represent each number using base 10

0.512

1.352

2.003

b) Use your representations to help you complete the statements.

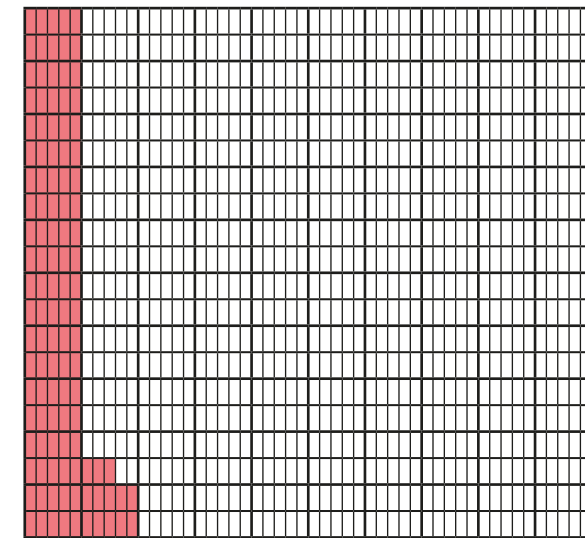
$$0.512 = 0.5 + 0.01 + \boxed{}$$

$$1.352 = 1 + \boxed{} + \boxed{} + \boxed{}$$

$$2.003 = \underline{\hspace{2cm}}$$

3 Here is a thousand square.

Part of the square has been coloured.



a) Why do you think it is called a thousand square?

b) What fraction of the square has been coloured?

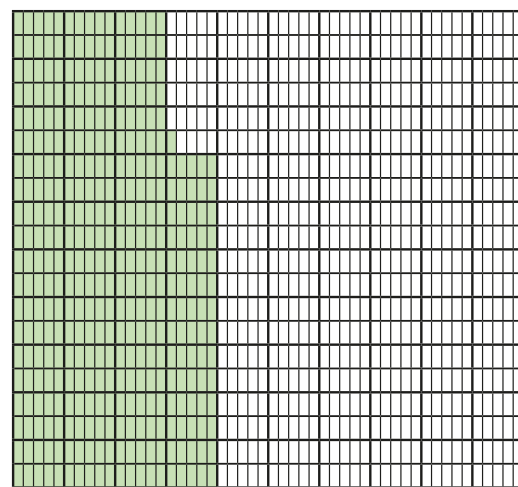
$\frac{\boxed{}}{1000}$

c) Write the fraction as a decimal.

- 4 What fraction of each square has been shaded?

Write each number as a fraction and as a decimal.

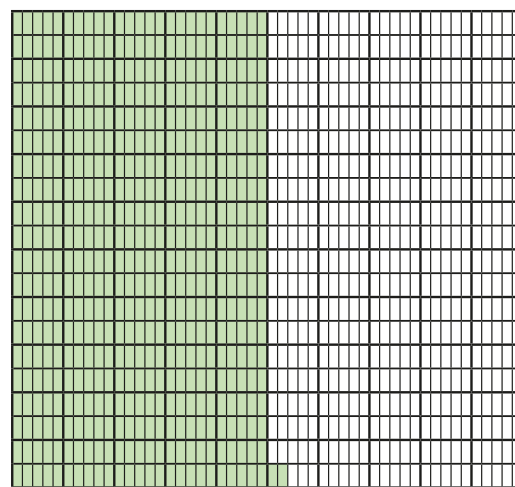
a)



fraction =

decimal =

b)

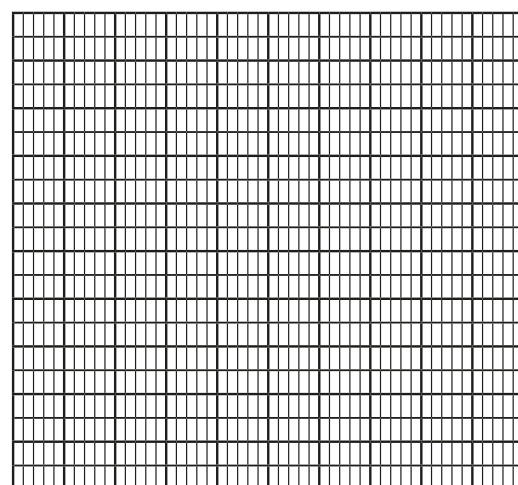


fraction =

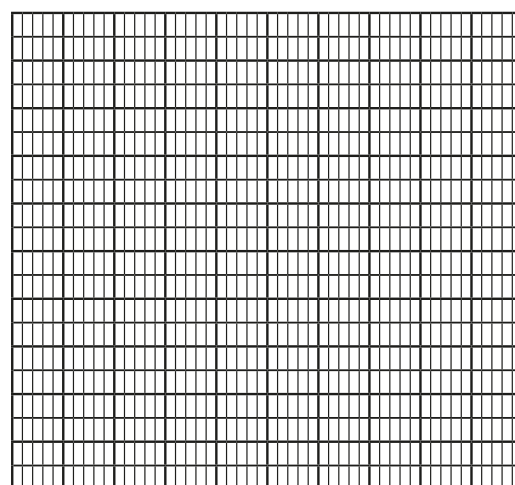
decimal =

- 5 Colour the grids to represent the fraction and decimal.

a) $\frac{73}{1000}$



b) 0.302



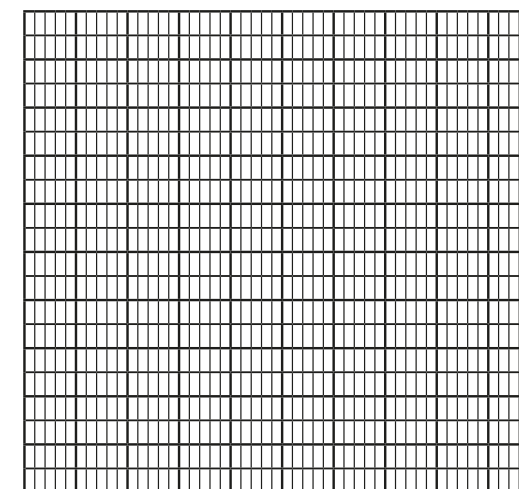
- 6 Represent these numbers on a place value chart.

a) 1.372

b) 0.091

c) 3.542

- 7 Show that $\frac{400}{1000}$ is the same as 0.4



- 8 Write the numbers represented by the place value charts.

a)

Ones	Tenths	Hundredths	Thousandths
1 1 1 1	0.1 0.1	0.01 0.01 0.01 0.01 0.01 0.01 0.01	0.001 0.001 0.001 0.001 0.001 0.001

b)

Ones	Tenths	Hundredths	Thousandths
	0.1 0.1 0.1 0.1 0.1		0.001 0.001 0.001 0.001





T	O	Tth	Hth	Thth

T	O	Tth	Hth	Thth

T	O	Tth	Hth	Thth

T	O	Tth	Hth	Thth

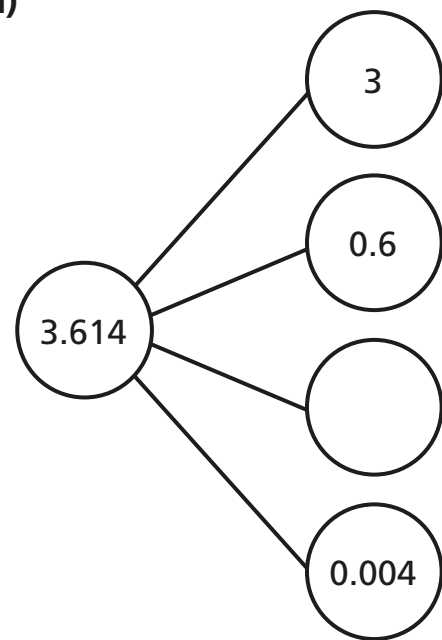
O	Tth	Hth	Thth
● ●	● ●	● ●	● ●
●	●	● ●	● ●
			●

The number in digits is

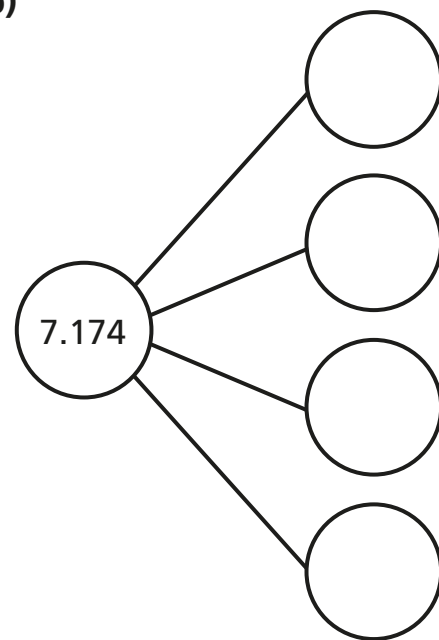
f) 19.03

4 Complete the part-whole models.

a)



b)



5 Complete the number sentences.

a) $17.134 = 10 + 7 + 0.1 + \boxed{} + 0.004$

b) $94.077 = 90 + 4 + 0.07 + \boxed{}$

c) $\boxed{} = 30 + 4 + 0.07 + 0.009$

6 Complete the number sentences.

$1.456 = 1 + 0.4 + \boxed{} + 0.006$

$1.456 = 1 + 0.3 + \boxed{} + 0.006$

$1.456 = 1 + 0.2 + \boxed{} + 0.006$

$1.456 = 1 + \boxed{} + 0.006$

7 Mo and Annie have represented 0.121 on their place value charts.

Mo's chart

O	Tth	Hth	Thth
	●	● ●	●

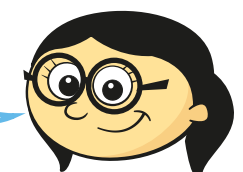
Annie's chart

O	Tth	Hth	Thth
		● ● ● ● ● ● ● ●	●



Mo

Only my grid shows 0.121



Annie

Both our grids show 0.121

Who do you agree with? _____

Explain why.

Multiply by 10, 100 and 1,000



1 Complete the calculations and sentences.

Use place value counters to help you.

Th	H	T	O	Tth	Hth
			●●	●●●	

a) $2.3 \times 10 =$

When the number is multiplied by 10 the counters move place to the left.

b) $2.3 \times 100 =$

When the number is multiplied by 100 the counters move places to the left.

c) $2.3 \times 1,000 =$

When the number is multiplied by 1,000 the counters move places to the left.

2 Complete the diagram.



3 a) Draw counters on the place value charts to represent each calculation.

4.4×1

Th	H	T	O	Tth	Hth

4.4×10

Th	H	T	O	Tth	Hth

4.4×100

Th	H	T	O	Tth	Hth

$4.4 \times 1,000$

Th	H	T	O	Tth	Hth

b) Complete the calculations.

$4.4 \times 1 =$

$4.4 \times 10 =$

$4.4 \times 100 =$

$4.4 \times 1,000 =$

What do you notice?



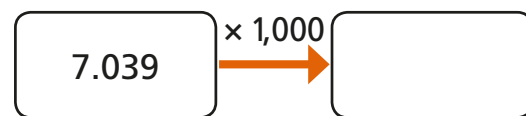
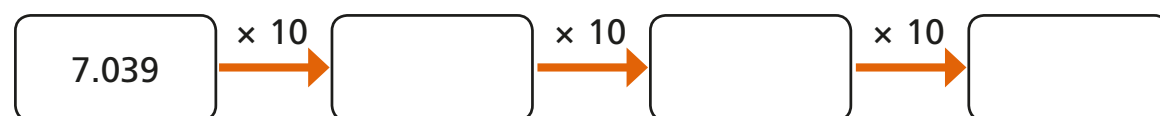
4 Complete the calculations.

a) $13.44 \times 10 =$ d) $4.4 \times$ $= 4,400$

b) $41.4 \times 100 =$ e) $= 1.03 \times 100$

c) $0.415 \times 1,000 =$ f) $30.44 =$ $\times 10$

5 Complete the diagrams.



What do you notice? Why does this happen?

6 Write $>$, $<$ or $=$ to compare the number sentences.

$1.4 \times 10 \times 10 \times 10$ $1.4 \times 1,000$

$1.4 \times 10 \times 100$ $1.4 \times 1,000$

$1.4 \times 10 \times 10$ $1.4 \times 1,000$

$1.4 \times 10 \times 2$ 1.4×100

7 Kim is calculating 14.3×200
She writes this as her answer.

$$14.3 \times 200 = 28.600$$

Explain Kim's mistake.

8 Use the cards to complete the calculation.
You can use each card more than once.

How many ways is it possible to complete this calculation?

Talk about it with a partner.



Divide by 10, 100 and 1,000



1 Complete the calculations and sentences.

Use place value counters to help you.

Th	H	T	O	Tth	Hth
	●	●● ●●			

a) $140 \div 10 =$

When the number is divided by 10 the counters move place to the right.

b) $140 \div 100 =$

When the number is divided by 100 the counters move places to the right.

c) $140 \div 1,000 =$

When the number is divided by 1,000 the counters move places to the right.

2 Complete the diagram.



3 a) Draw counters to represent the calculations.

$123 \div 1$

H	T	O	Tth	Hth	Thth

$123 \div 10$

H	T	O	Tth	Hth	Thth

$123 \div 100$

H	T	O	Tth	Hth	Thth

$123 \div 1,000$

H	T	O	Tth	Hth	Thth

b) Complete the calculations.

$123 \div 1 =$

$123 \div 10 =$

$123 \div 100 =$

$123 \div 1,000 =$

What do you notice?





4 Complete the calculations.

a) $16 \div 10 =$

d) $332 \div$ $= 0.332$

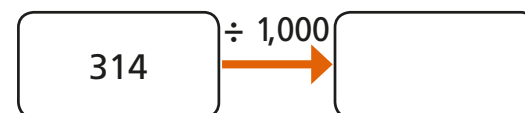
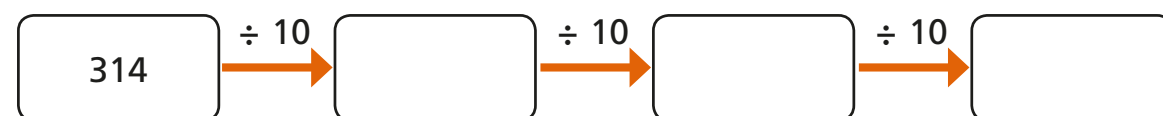
b) $43.4 \div 100 =$

e) $2.4 \div 200 =$

c) $614 \div 1,000 =$

f) $5.09 =$ $\div 20$

5 Complete the diagrams.



What do you notice? Why does this happen?

6 Write $>$, $<$ or $=$ to compare the number sentences.

$5,400 \div 10 \div 10 \div 10$ $5,400 \div 1,000$

$60 \div 100 \div 10$ $600 \div 100$

$5.7 \div 10$ $57 \div 100$

$5,601 \div 1,000$ $5.601 \div 10$

7 Dexter is solving the calculation $5,400 \div 100$

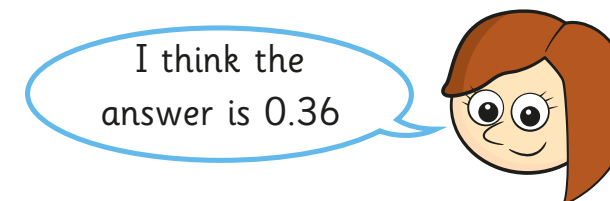


I think the answer is 54.00

Is Dexter correct? _____

Explain your reasoning.

8 Rosie is solving the calculation $3,600 \div 200$



I think the answer is 0.36

Is Rosie correct? _____

Explain your reasoning.



Multiply decimals by integers



1 Use place value counters to solve the calculations.

a) $3.2 \times 3 =$

Ones	Tenths
1 1 1	0.1 0.1
1 1 1	0.1 0.1
1 1 1	0.1 0.1

b) $4.6 \times 2 =$

Ones	Tenths
1 1 1 1	0.1 0.1 0.1 0.1 0.1
1 1 1 1	0.1 0.1 0.1 0.1 0.1

2 Solve the multiplication. Draw your answer.

$12.2 \times 3 =$

Tens	Ones	Tenths

3 Nijah uses long multiplication to solve 3.72×3

		3	.	7	2
	x				3
		0	.	0	6
		2	.	1	0
		9	.	0	0
	1	1	.	1	6

Use long multiplication to work out the calculations.

a)

		4	.	8	6
	x				4

b)

		2	.	0	9
	x				6

4 Work out the multiplications.

a) $5.2 \times 4 =$

d) $= 2.34 \times 3$

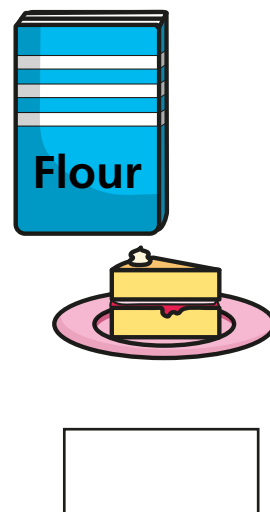
b) $14.3 \times 3 =$

e) $11.505 \times 4 =$

c) $6 \times 9.1 =$

f) $9.602 \times 6 =$

- 5 0.25 kg of flour is needed to make one cake.
How much flour is needed to make four cakes?



- 6 Work out the multiplications.

a) $7.2 \times 2 =$

$7.2 \times 4 =$

$14.4 \times 4 =$

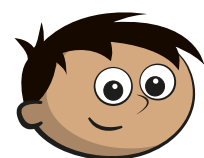
$7.2 \times 8 =$

b) $= 3.45 \times 3$

$= 34.5 \times 3$

$= 345 \times 3$

- 7 Amir is solving 3.4×4



To solve this, I
did 34×4 , which was 136
Then I multiplied my answer
by 10 to get an answer
of 1,360

Do you agree with Amir? _____

Explain why.

- 8 Use the digits 1, 2, 3 and 4 once each to create a calculation.

1	2	3	4
---	---	---	---

<input type="text"/>	.	<input type="text"/>	<input type="text"/>	\times	<input type="text"/>
----------------------	---	----------------------	----------------------	----------	----------------------

- a) How many different products can you make?

- b) What is the greatest possible product?

- c) What is the smallest possible product?

- d) What is the product closest to 12?

Compare answers with a partner.



Divide decimals by integers



1 Use place value counters to work out the divisions.

a) $8.4 \div 4 =$

Ones		Tenths
1	1	0.1
1	1	0.1
1	1	0.1
1	1	0.1

b) $12.3 \div 3 =$

Tens	Ones	Tenths
10	1	0.1
	1	0.1
		0.1

2 Work out the division. Draw your answer.

$16.4 \div 4 =$

Tens	Ones	Tenths



3 Brett uses short division to work out $13.2 \div 6$

		0	2	2	
	6	1	3	2	

Use short division to work out the calculations.

a)

	7	2	2	4	

b)

	8	1	8	4	8

4 Work out the divisions.

a) $25.6 \div 8 =$

d) $= 19.45 \div 5$

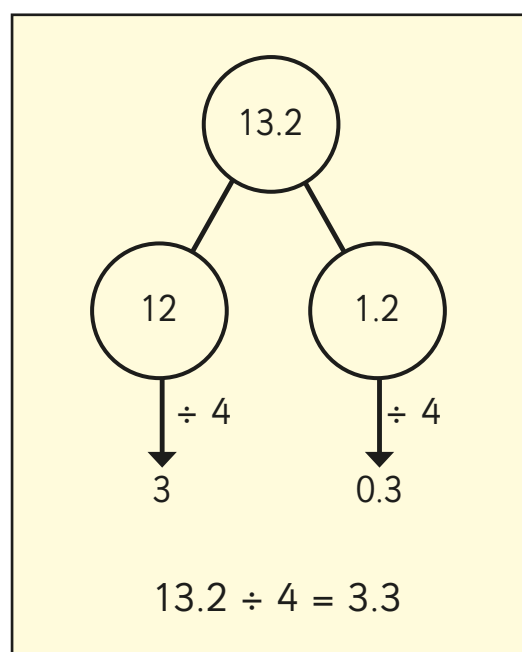
b) $14.8 \div 4 =$

e) $202.35 \div 3 =$

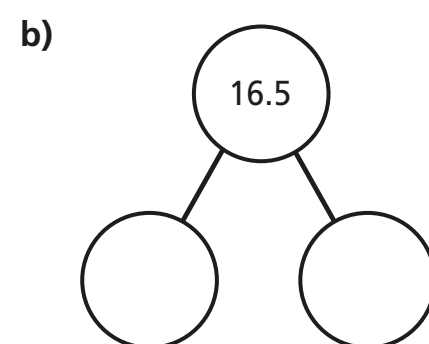
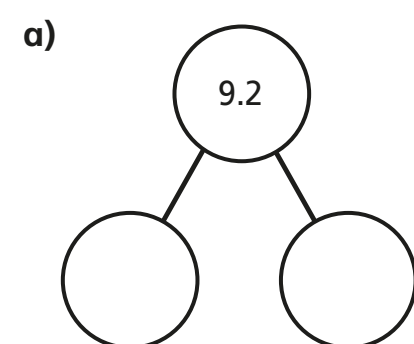
c) $18.48 \div 6 =$

f) $105.12 \div 9 =$

- 5 Esther solves $13.2 \div 4$ by partitioning 13.2 into two numbers that are easier to divide.



Use Esther's method to complete the part-whole model and calculation.



$$9.2 \div 4 = \boxed{}$$

$$16.5 \div 3 = \boxed{}$$

Compare answers with a partner. Did you partition your numbers in the same way?



- 6 Work out the divisions.

a) $9.64 \div 4 = \boxed{}$

$$96.4 \div 4 = \boxed{}$$

$$0.964 \div 4 = \boxed{}$$

$$9.64 \div 8 = \boxed{}$$

b) $19.44 \div 9 = \boxed{}$

$$19.53 \div 9 = \boxed{}$$

$$19.62 \div 9 = \boxed{}$$

- 7 Fill in the missing numbers.

$$3.6 \div 4 = 36 \div \boxed{}$$

$$3.6 \div 4 = \boxed{} \div 8$$

- 8 Complete the calculation.

$$8.4 \div \boxed{} = 4.2 \div \boxed{}$$

How many different solutions can you find?

What patterns do you notice? Talk about it with a partner.



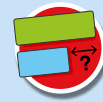
Division to solve problems

- 1 There are 1,360 children in a school.
A quarter of the children walk to school.
How many children walk to school?

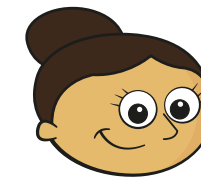
- 2 Huan has saved his pocket money for 5 weeks.
He gets the same pocket money every week.
He has saved £16.65
How much pocket money does Huan get each week?



- 3 Tom is running a 6-kilometre race.
He has run one-third of the race so far.
How many more kilometres does Tom have left to run?

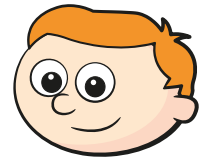


- 4 Dora, Ron and Teddy are making paper chains.



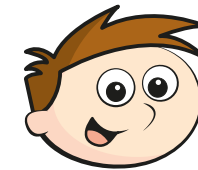
Dora

My paper chain
is 1.1 m long.



Ron

Dora's paper chain
is twice as long
as mine.



Teddy

My paper chain
is three times longer
than Ron's.

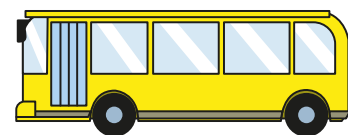
- a) How long is Ron's paper chain?

- b) How long is Teddy's paper chain?

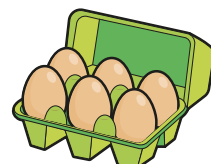
- 5 A water bottle holds 2 litres.
A leak in the bottle means 25 ml drips out each day.
How many days will it take until the bottle is empty?


 days


- 6 a) A school bus can hold 30 people.
There are 726 children going on a school trip.
How many buses are needed?



- b) A cake needs 4 eggs.
How many cakes can be made from 345 eggs?

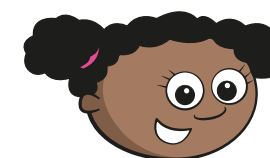


- 7 Shop A sells 5 tins of paint for £23.40
Shop B sells 3 tins of the same paint for £14.01



Which shop should Aisha buy her paint from? _____
Explain your reasoning.

- 8 $146 \div 5 = 29$ remainder 1
 $117 \div 4 = 29$ remainder 1



This means that
 $117 \div 4 = 146 \div 5$

Do you agree with Whitney? _____
Explain your thinking.

- 9 I'm thinking of a 3-digit number.
When I divide it by 5, I am left with a remainder of 3
When I divide it by 10, I am left with a remainder of 8
It rounds to 200 to the nearest 100
It has one hundred.
What could my number be?

Create your own problem like this for a partner.



Decimals as fractions

1 Complete the sentences.

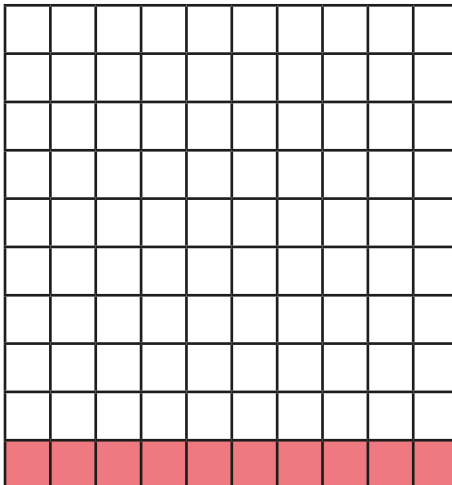
a)

0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

The whole has been divided into equal parts.

Each part is worth

This is equivalent to

b) 

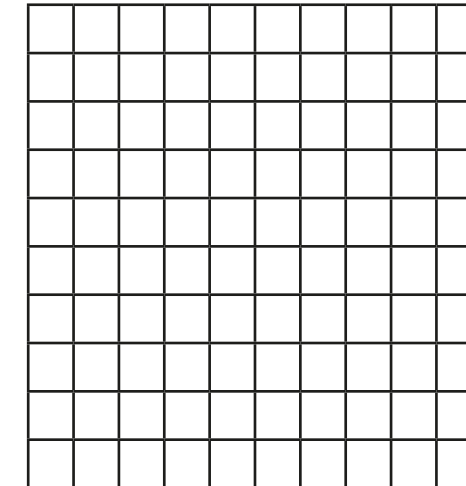
The whole has been divided into equal parts.

Each part is worth

parts out of are shaded.

This is equivalent to

2 a) Shade 0.17 of the hundred square.



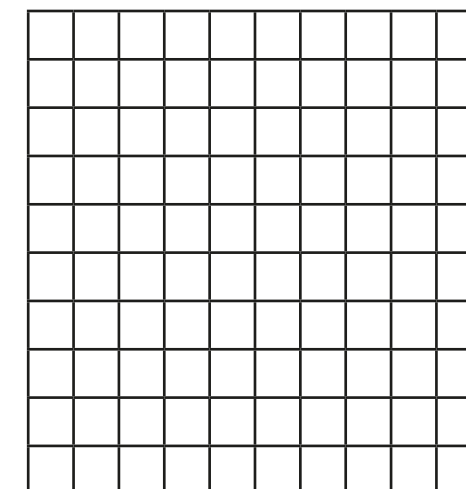
Complete the sentence.

parts out of are shaded.

Write 0.17 as a fraction.

0.17 =

b) Shade 0.2 of the hundred square.



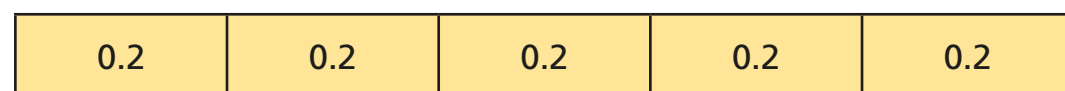
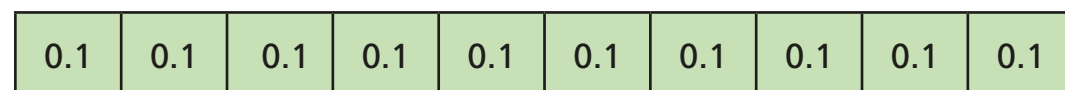
Complete the sentence.

parts out of are shaded.

Write 0.2 as a fraction in its simplest form.

0.2 =

3



Use the bar models to fill in the missing numbers.

$$0.2 = \frac{\boxed{}}{10} = \frac{1}{\boxed{}}$$

$$0.4 = \frac{\boxed{}}{10} = \frac{2}{\boxed{}}$$

$$\boxed{} = \frac{\boxed{}}{10} = \frac{4}{5}$$

4

Fill in the missing numbers.

$$\text{a) } 0.54 = \frac{\boxed{}}{100} = \frac{\boxed{}}{50}$$

$$\text{b) } 0.6 = \frac{\boxed{}}{10} = \frac{\boxed{}}{5}$$

$$\text{c) } 0.3 = \frac{\boxed{}}{10} = \frac{\boxed{}}{100}$$

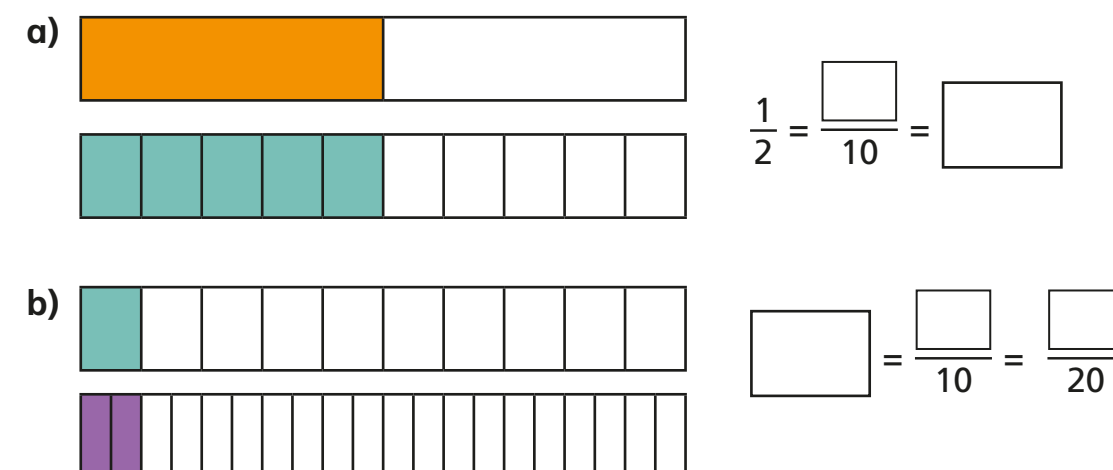
$$\text{d) } \boxed{} = \frac{9}{100}$$

$$\text{e) } \boxed{} = \frac{9}{10}$$

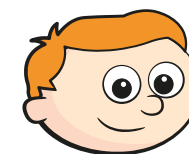
$$\text{f) } \frac{21}{50} = \frac{\boxed{}}{100} = \boxed{}$$

5

Use the bar models to fill in the missing numbers.



6



$$0.3 = \frac{3}{10} \text{ so } 0.37 = \frac{37}{10}$$

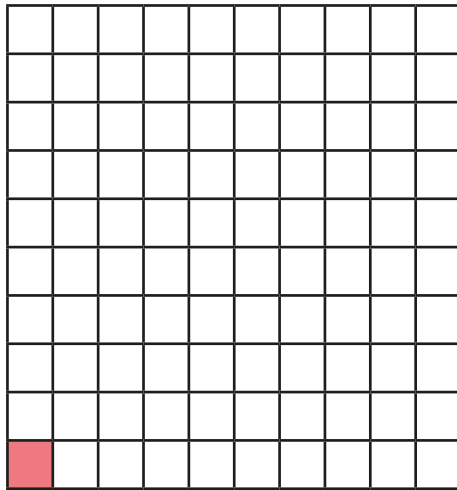
Draw a diagram to show that Ron is wrong.



Fractions to decimals (1)

1 Complete the sentences.

a)

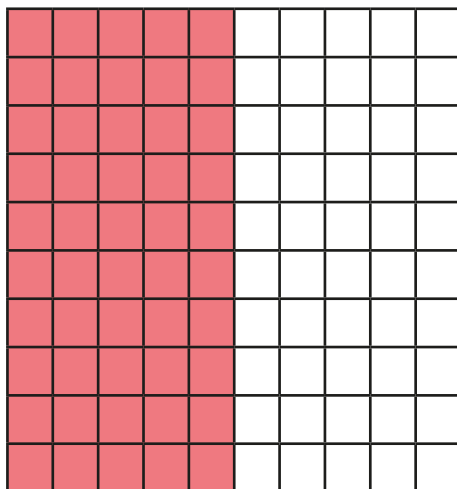


Each square represents $\frac{\square}{100}$

$\frac{\square}{100}$ of the whole square is shaded.

This is equivalent to \square as a decimal.

b)

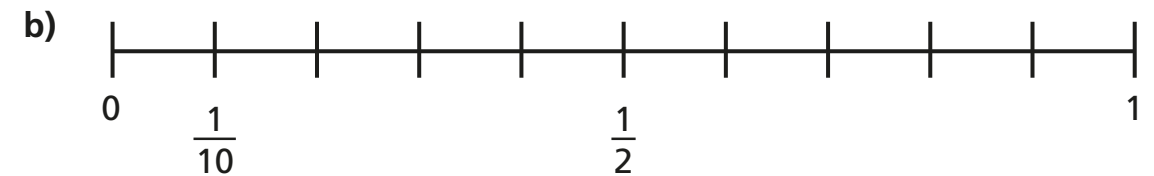
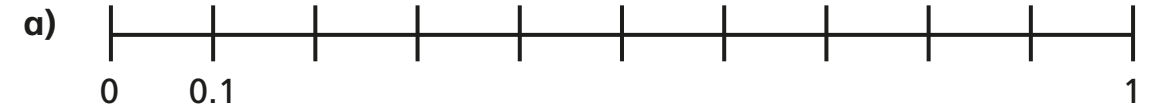


$\frac{\square}{100}$ of the whole square is shaded.

This can be simplified to $\frac{\square}{\square}$

This is equivalent to \square as a decimal.

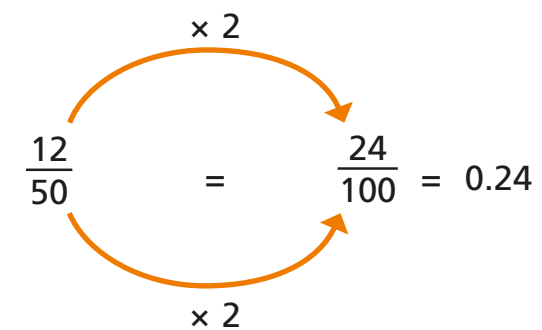
2



What is the same and what is different about the number lines?

3

To convert a fraction to a decimal, you can use equivalent fractions to make the denominator 100



Use this method to find the equivalent decimals for the fractions.

a) $\frac{28}{50} = \frac{\square}{100} = \square$

c) $\frac{9}{25} = \frac{\square}{100} = \square$

b) $\frac{6}{20} = \frac{\square}{100} = \square$

d) $\frac{24}{200} = \frac{\square}{100} = \square$

- 4 Some fractions can be converted to have a denominator of 1,000 to find their decimal equivalent.

$$\frac{62}{500} \xrightarrow{\times 2} \frac{124}{1000} = 0.124$$

a) $\frac{27}{500} = \frac{\boxed{}}{1000} = \boxed{}$

b) $\frac{62}{250} = \frac{\boxed{}}{1000} = \boxed{}$

c) $\frac{51}{200} = \frac{\boxed{}}{1000} = \boxed{}$

d) $\frac{128}{2,000} = \frac{\boxed{}}{1000} = \boxed{}$

- 5 Convert the fractions to their decimal equivalents.

a) $\frac{1}{5} = \boxed{}$

b) $\frac{1}{20} = \boxed{}$

$\frac{1}{10} = \boxed{}$

$\frac{2}{20} = \boxed{}$

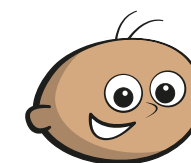
$\frac{1}{20} = \boxed{}$

$\frac{3}{20} = \boxed{}$

$\frac{1}{40} = \boxed{}$

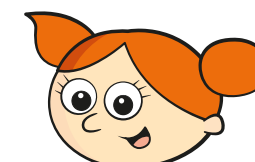
$\frac{6}{20} = \boxed{}$

- 6 Tommy, Alex and Eva are working out the decimal equivalent of $\frac{60}{200}$



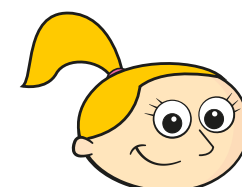
Tommy

You need to convert it to have a denominator of 100 to find the decimal equivalent.



Alex

I disagree. You need to convert it to have a denominator of 1,000



Eva

Both of you are right!

Who do you agree with? _____

Explain your thinking.

- 7 0.5 is equivalent to $\frac{1}{2}$, $\frac{5}{10}$, $\frac{50}{100}$

Are these the only fractions that are equivalent to 0.5?

How many fractions can you find?

Compare answers with a partner.



Fractions to decimals (2)

- 1 Fractions can be expressed as divisions.

For example, $\frac{1}{2} = 1 \div 2$

Write the fractions as divisions.

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

d) $\frac{\square}{\square} = 3 \div 5$

b) $\frac{2}{3} = \square \div \square$

e) $\frac{\square}{7} = 3 \div \square$

c) $\frac{4}{7} = \square \div \square$

f) $\frac{1}{10} = \square \div \square$

- 2 Use place value counters to find the decimal equivalent of $\frac{2}{5}$
You can draw on the place value chart to help you with exchanging.

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

Ones	Tenths
1 1	

- 3 Fractions can be converted to decimals by using the short division method.

For example, $\frac{1}{8} = 1 \div 8$

		0	1	2	5	
	8	1	0	2	0	

$\frac{1}{8} = 0.125$

Use the short division method to find the decimal equivalent of the fractions.

a)

			.			
	4	1	0	0		

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

b)

			.			
	5	4	0			

$\frac{4}{5} = \square$

c)

			.			
	8	3	0			

$\frac{3}{8} = \square$



4 Find the decimal equivalents for these fractions.

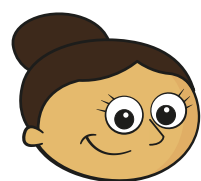
a) $\frac{7}{8} =$

c) $\frac{1}{16} =$

b) $\frac{7}{5} =$

d) $\frac{9}{16} =$

5



To find $\frac{19}{20}$ as a decimal,
I found $\frac{1}{20}$ as a decimal, then
took it away from 1

Here is Dora's working out.

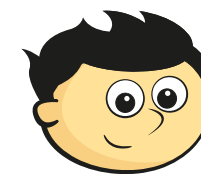
			0	.	0	5
2	0		1	.	0	¹⁰ 0

$$1 - 0.05 = 0.95$$

$$\frac{19}{20} = 0.95$$

Use Dora's method to find the decimal equivalent for $\frac{49}{50}$

6



I converted $\frac{1}{2}$ to
a decimal and got the
answer 2

Jack is incorrect.

Explain the mistake that Jack has made.

7

Filip is thinking of a fraction.

When he converts it to a decimal, it is smaller than 0.5 but greater than 0.4

What fraction could Filip be thinking of?

Are there any other possible answers? Talk to a partner.

8

Use the short division method to find the decimal equivalent of $\frac{1}{3}$

Compare answers with a partner.