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This tells you which page you need.



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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.



Decimals as fractions

Discover

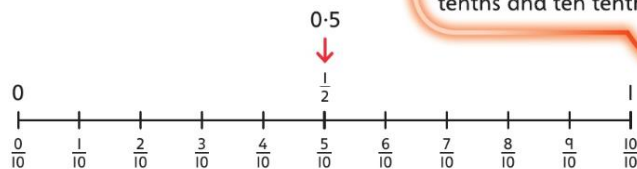


Sofia

- a) Where is Sofia on the route planner? Find the location on the route planner, and describe it as a fraction of a kilometre.
- b) After 15 minutes Sofia has run 1.5 km. Locate her position on the route planner, and describe it as a fraction.

Share

- a) 0.5 is equivalent to one half.



0.5 is equivalent to a half, because five tenths is half-way between zero tenths and ten tenths.



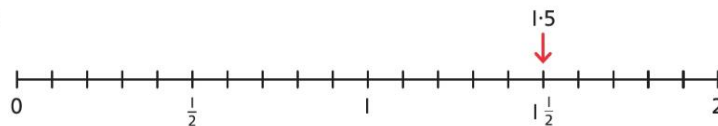
I think you could also write her distance as $\frac{5}{10}$ km, because $\frac{5}{10}$ is equivalent to $\frac{1}{2}$.



0	.	Tth
0	.	5

Sofia has run 0.5 km, which can also be written as $\frac{1}{2}$ km.

- b)

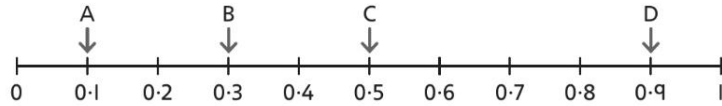


1.5 is equivalent to $1\frac{1}{2}$ and $1\frac{5}{10}$.

Lesson 1

Decimals as fractions

1 a) Write each number as a fraction.



$$A = \frac{\boxed{}}{\boxed{}}$$

$$B = \frac{\boxed{}}{\boxed{}}$$

$$C = \frac{\boxed{}}{\boxed{}} \text{ or } \frac{\boxed{}}{\boxed{}}$$

$$D = \frac{\boxed{}}{\boxed{}}$$

b) Explain why C can be written as two different fractions.

2 Draw place value counters to represent each number.

$\frac{4}{10}$

O	.	Tth
	.	

$1\frac{4}{10}$

O	.	Tth
	.	

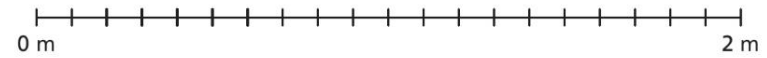
$2\frac{3}{4}$

O	.	Tth	Hth
	.		

$1\frac{1}{4}$

3 Here are the results from a long jump competition. Mark each distance jumped on the number line.

Child	Distance jumped
Jamie	1.25 m
Aki	0.75 m
Ambika	$1\frac{3}{4}$ m
Richard	$1\frac{1}{2}$ m



Explain your method.

4 Convert the fractions to decimals and the decimals to fractions.

a) $\frac{1}{4} = \boxed{}.\boxed{}$

b) $\frac{2}{4} = \boxed{}.\boxed{}$

c) $\frac{3}{4} = \boxed{}.\boxed{}$

d) $\frac{4}{4} = \boxed{}.\boxed{}$

e) $\frac{6}{4} = \boxed{}.\boxed{}$

f) $\frac{8}{4} = \boxed{}.\boxed{}$

g) $0.3 = \frac{\boxed{}}{10}$

h) $\frac{3}{2} = \boxed{}.\boxed{}$

i) $3.2 = \boxed{}.\boxed{}$

j) $3.4 = \boxed{}.\boxed{}$

k) $\boxed{} = \frac{3}{3}$

l) $\frac{\boxed{}}{3} = 2$

Understanding thousandths

Discover



Jamilla

- 1 a) A fraction has been shaded in each of the three diagrams.

Write each as a fraction and as a decimal.

- b) Jamilla shades each diagram to show 0.5.

Write this as $\frac{\square}{10}$, $\frac{\square}{100}$ and $\frac{\square}{1,000}$.

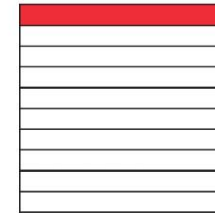
Share

- a) Each grid represents a whole.

- 1 The whole is split into 10 equal parts.

Each part is $\frac{1}{10}$.

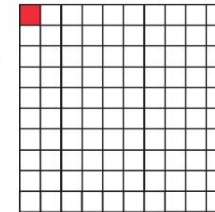
$$\frac{1}{10} = 0.1$$



- 2 Now each tenth is split into 10 equal parts. There are 100 equal parts.

Each part is $\frac{1}{100}$.

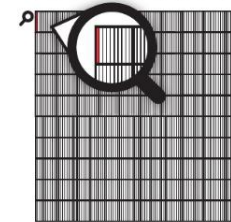
$$\frac{1}{100} = 0.01$$



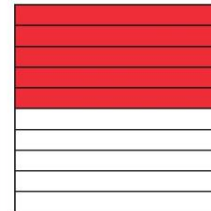
- 3 Now each hundredth is split into 10 equal parts. There are 1,000 equal parts.

Each part is $\frac{1}{1,000}$.

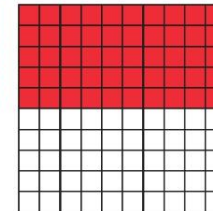
$$\frac{1}{1,000} = 0.001$$



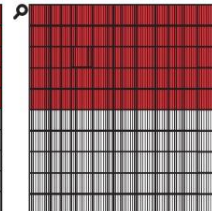
- b) 0.5 is equivalent to $\frac{1}{2}$.



$$0.5 = \frac{5}{10}$$



$$0.5 = \frac{50}{100}$$

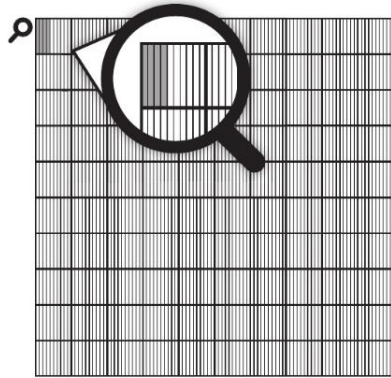


$$0.5 = \frac{500}{1,000}$$

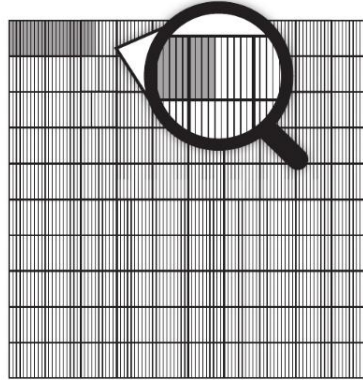
Lesson 2

Understanding thousandths

1 Write the numbers as both decimals and fractions.

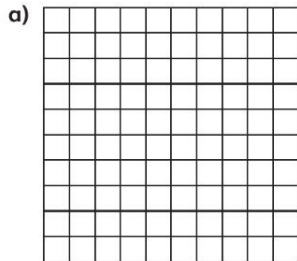


a) $0.\square = \frac{\square}{1,000}$

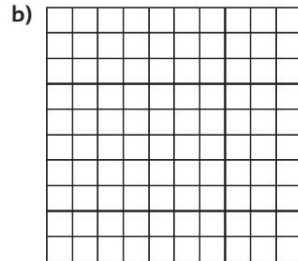


b) $0.\square = \frac{\square}{1,000}$

2 Shade to show these fractions and decimals.



$\frac{50}{1,000} = \frac{\square}{100} = 0.05$



$\frac{\square}{1,000} = \frac{\square}{100} = \frac{\square}{10} = 0.9$

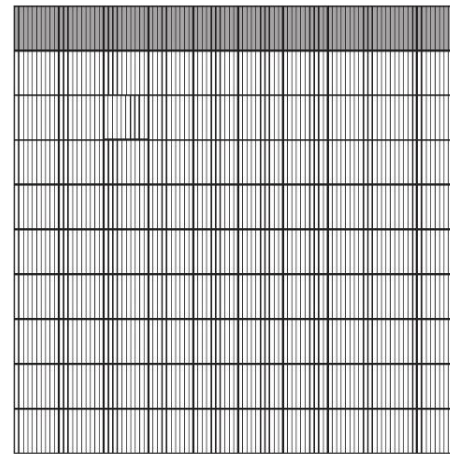
3 Complete the table.

Decimal	0.002		0.251		0.2
Fraction	$\frac{\square}{\square}$	$\frac{20}{1,000}$	$\frac{\square}{1,000}$	$\frac{250}{1,000}$	$\frac{\square}{1,000}$

Decimal			1.251	1.25	0.000
Fraction	$\frac{1,000}{1,000}$	$\frac{1,001}{1,000}$	$\frac{\square}{1,000}$	$\frac{\square}{1,000}$	$\frac{\square}{1,000}$

4 Alex shades in $\frac{1}{10}$ of her diagram. She writes:

$0.1 = 0.10 = 0.100$ $\frac{1}{10} = \frac{10}{100} = \frac{100}{1,000}$



Find equivalent ways of writing:

a) 0.2

b) 0.07

c) $\frac{350}{1,000}$

Rounding decimals

Discover



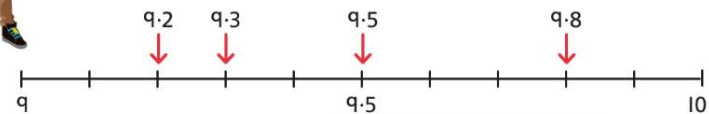
- 1** a) Do you agree with Jen that all of the boxes weigh approximately 9 kg? Round each weight to the nearest whole number.
- b) A fifth box rounds to 9 kg. What could it weigh?

Share

- a) Each of the four boxes weighs between 9 kg and 10 kg. To round to the nearest whole number, work out if it is nearer to 9 or nearer to 10.



I drew a number line and marked it in tenths. Now I can see that 9.2 and 9.3 are nearer to 9, and 9.8 is nearer to 10. But what about 9.5?

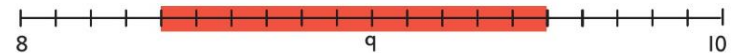


9.5 is exactly half-way between 9 and 10. The half-way number always rounds up.



9.2 and 9.3 round to 9 kg to the nearest whole number.
9.5 and 9.8 round to 10 kg to the nearest whole number.

- b) 8.5 rounds to 9, but 9.5 rounds to 10. The box could weigh from 8.5 kg up to 9.49 kg.

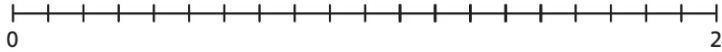


Lesson 3

Rounding decimals

- 1 a) Draw an arrow to show where each number should be placed on the number line.

0.9 1.3 0.87 0.5 1.75



- b) Now round each number to the nearest whole number.

0.9 rounds to to the nearest whole number.

1.3 rounds to to the nearest whole number.

0.87 rounds to to the nearest whole number.

0.5 rounds to to the nearest whole number.

1.75 rounds to to the nearest whole number.

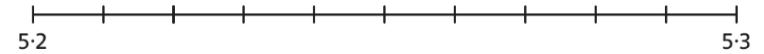
- 2 Measure each line. Give the answer as an exact decimal, and then rounded to the nearest centimetre.

One has been done for you.

	2.3 cm rounds to 2 cm.
	<input type="text"/> cm rounds to <input type="text"/> cm.
	<input type="text"/> cm rounds to <input type="text"/> cm.
	<input type="text"/> cm rounds to <input type="text"/> cm.
	<input type="text"/> cm rounds to <input type="text"/> cm.

- 3 Round 5.23 to the nearest tenth.

a) 5.23 rounds to to nearest tenth.



- b) Explain how you can round 5.23 to the nearest tenth without drawing a number line.

Which digit do you need to look at?

- 4 Complete the table.

Number	Rounded to nearest whole number	Rounded to the nearest tenth
1.19		
10.19		
0.75		
100.75		
100.03		
100.037		

- 5 Mia has to round 2.76 to one decimal place. She says, 'The hundredths digit is greater than five, so the tenths digit increases by 1. The answer is 2.86'.

How you could explain the mistake to her?



Lesson 4

Ordering and comparing decimals

Discover



- a) Order the results from smallest to largest. Who had the quickest reaction time?
- b) Convert the decimals to fractions. Use this to check the comparison made in a).

Share

a) The reaction times to compare have digits in the tenths column.

5.9 has the fewest ones, so this is the smallest.

6.2 and 6.5 have the same number of ones, so we look at the tenths.

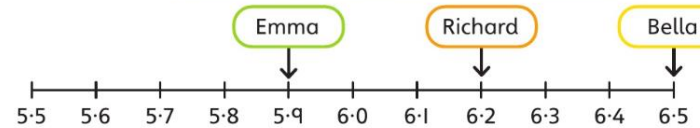
6.2 has the fewest tenths, so this is the next smallest number.

$$5.9 \text{ cm} < 6.2 \text{ cm} < 6.5 \text{ cm}$$

The shorter the distance the quicker reaction speed.

O	.	Tth
5	.	9
6	.	2
6	.	5

I will use a number line to help me compare.



Emma's result was the shortest distance, so she has the quickest reaction time.

b)

	$6.2 = 6 \frac{2}{10} = \frac{62}{10}$ That is 62 tenths.
	$6.5 = 6 \frac{5}{10} = \frac{65}{10}$ That is 65 tenths.
	$5.9 = 5 \frac{9}{10} = \frac{59}{10}$ That is 59 tenths.

59 tenths is less than 62 tenths which is less than 65 tenths.
 $59 < 62 < 65$

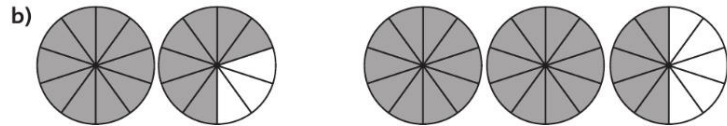
Lesson 4

Ordering and comparing decimals

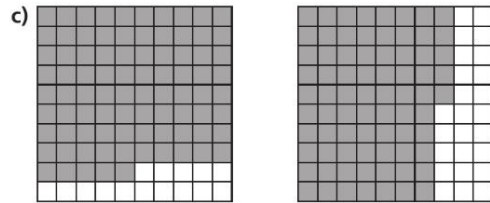
1 Complete the sentences to describe the representations using **less** or **greater**.



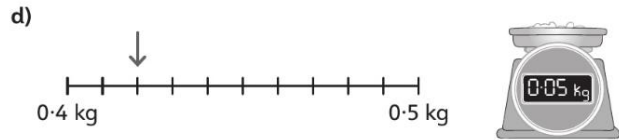
0.7 is _____ than 0.5



0.8 is _____ than 0.9

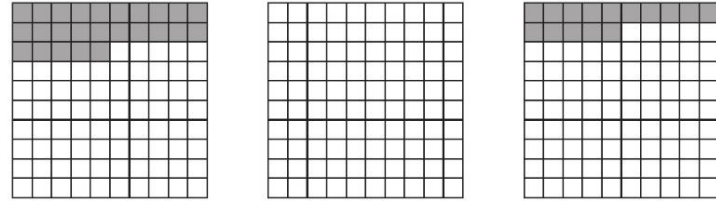


0.46 is _____ than 0.42



0.45 is _____ than 0.05

2 Complete the shading so that the inequality is correct.



0.15 is greater than 0.10 which is greater than 0.10

3 Jamilla rates these dinosaurs for fierceness.

Sort the list into order, starting with least fierce.

Dinosaur	Fierceness (0 is not fierce, 10 is the most fierce)
Brachiosaurus	4.607
Triceratops	8.925
T-Rex	9.525
Stegosaurus	8.923
Spinosaurus	9.519

Order (1st is least fierce, 5th is most fierce)	Dinosaur
1st	
2nd	
3rd	
4th	
5th	

4 Complete using <, > and =.

0.255 $\frac{251}{1,000}$

0.089 1.001

$\frac{980}{1,000}$ $\frac{97}{100}$