





















# Fractions: Doughnut Decimals

<b>Aim:</b> Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.  I can recognise thousandths and use them as decimals and fractions.	<b>Success Criteria:</b> I can identify thousandths.  I can write decimal numbers with thousandths as fractions using a denominator of one thousand.	<b>Resources:</b> <a href="#">Lesson Pack</a>  Whiteboards and pens - class set
	<b>Key/New Words:</b> Thousandth, hundredth, tenth, equivalent, decimal.	<b>Preparation:</b> <a href="#">Doughnut Decimals Activity Sheets</a> - one per child  <a href="#">Doughnut Decimal Loop Cards</a> - one per group

**Prior Learning:** It will be helpful if children have a good understanding of the relationship between tenths and hundredths.

## Learning Sequence

	<b>Decimal Hundredths:</b> Use the counting stick on the <a href="#">Lesson Presentation</a> to rehearse counting forwards and backwards in different steps of decimal hundredths.	
	<b>Thousandths:</b> Use the text and images displayed on the <a href="#">Lesson Presentation</a> to remind the children that numbers that have digits to the right of a decimal point are numbers between whole numbers. Rehearse the decimal place value positions of tenths and hundredths and introduce the place value position of thousandths using base ten equipment.	
	<b>Writing a Decimal:</b> Working with a partner, identify the decimal numbers represented in base ten equipment on the <a href="#">Lesson Presentation</a> . Clarify the role of the place-holding zeros: that there is nothing in the column, but we still need to show the ones and tenths to give value to the hundredths column.	
	<b>Decimals as Fractions:</b> Use the text and images displayed on the <a href="#">Lesson Presentation</a> to practise reading and writing decimals including thousandths as fractions with a denominator of ten, one hundred or one thousand. Emphasise decimal equivalence between tenths, hundredths and thousandths.	
	<b>What's My Number?</b> The children sit back to back with their partner, with only one child able to see the whiteboard. The child facing the whiteboard has thirty seconds to describe the decimal number shown on the <a href="#">Lesson Presentation</a> using the language of tenths, hundredths and thousandths. The pair score 1 point if the other child writes the correct fraction equivalent on their individual whiteboard. The children swap roles for the next round.	
   Match up the decimal and fraction equivalents involving tenths, hundredths and thousandths.  Convert between decimals and fractions that involve thousandths and put them on a number line.  Convert between decimals and fractions that involve thousandths and use them to complete magic squares that total 1.		
   Children explore how many thousandths make a whole, a tenths and a hundredth. They match base ten representations of decimals to decimal number and draw representations.  Children identify errors in pictorial representations of decimal numbers. They partition numbers with 3 decimal places in different ways.  Children apply their understanding to problems involving decimals with three decimal places.		



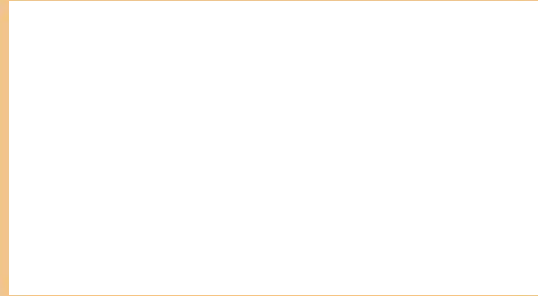
**Doughnut Decimal Loops:** Using the [Doughnut Decimal Loop Cards](#) the children work in groups to match the decimal number to the correct equivalent fraction.



### Exploreit

**Matchit:** Using the [Tenths, Hundredths and Thousandths Cards](#) take it in turns to turn over two cards to try and find equivalent fractions. Some of the thousandths fractions don't have a match. These can either be removed or could be kept by children who identify them as having no tenth or hundredth equivalent.

**Compareit:** Select two of the [Tenths, Hundredths and Thousandths Cards](#) and write a comparison statement about them using the greater than or less than symbols.



# Maths

## Fractions

# Doughnut Decimals



# Aim

- I can recognise thousandths and use them as decimals and fractions.

# Success Criteria

- I can identify thousandths.
- I can write decimal numbers with thousandths as fractions using a denominator of one thousand.

# Decimal Hundredths

Count forwards and backwards along the decimal hundredths counting stick.



0.1

0.11

0.12

0.13

0.14

0.15

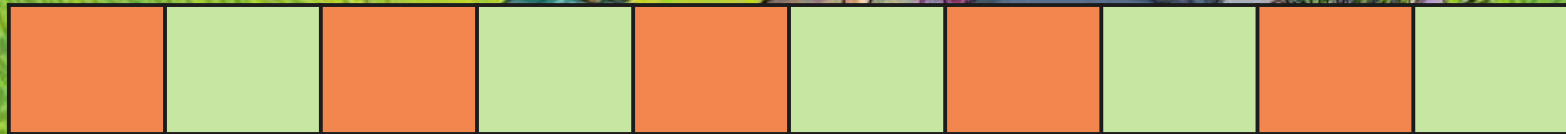
0.16

0.17

0.18

0.19

0.2



# Decimal Hundredths

Count forwards and backwards along the decimal hundredths counting stick.



0.1

0.12

0.14

0.16

0.18

0.2

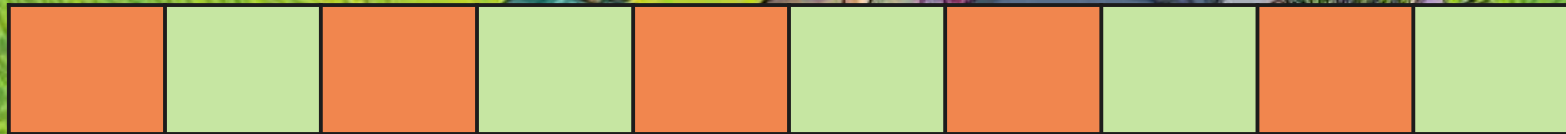
0.22

0.24

0.26

0.28

0.3



# Decimal Hundredths

Count forwards and backwards along the decimal hundredths counting stick.



0.1

0.15

0.2

0.25

0.3

0.35

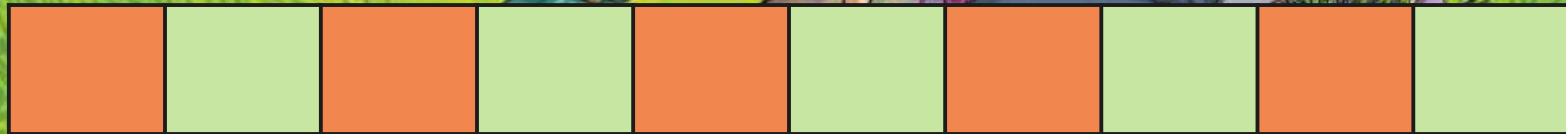
0.4

0.45

0.5

0.55

0.6





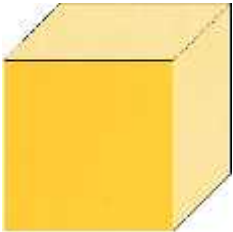
# Thousandths

Whole Class

Any digit immediately to the right of the **decimal point** is a **tenth**.

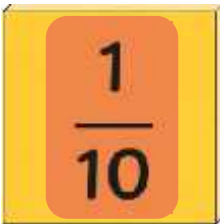
$$1 = \frac{10}{10}$$

$\times 10$

tens	ones
	

•

$\div 10$

tenths		
		

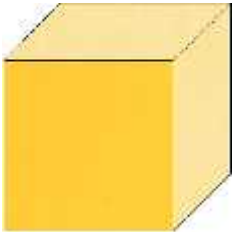
# Thousandths

Whole Class

Any digit immediately to the right of the **tenth** column is a **hundredth**.


$$1 = \frac{10}{10} = \frac{100}{100}$$

$\times 100$

tens	ones
	

●

$\div 100$

tenths	hundredths	
		

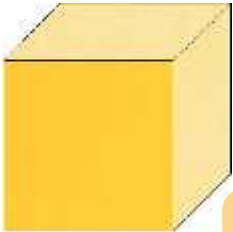
# Thousandths

Whole Class


Any digit immediately to the right of the **hundredth** column is a **thousandth**.

$$1 = \frac{10}{10} = \frac{100}{100} = \frac{1000}{1000}$$

× 1000

tens	ones
	

•

tenths	hundredths	thousandths
		 $\frac{1}{1000}$

÷ 1000

# Thousandths

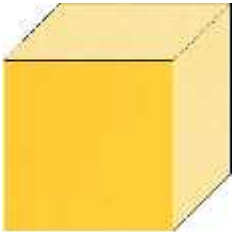
Whole Class

Each place value column gets **10 times smaller**.

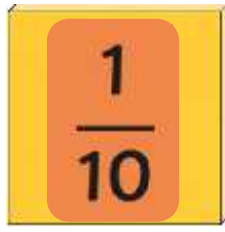


$\div 10$

$\div 10$

$\div 10$

tens	ones
	



tenths	hundredths	thousandths
 $\frac{1}{10}$	 $\frac{1}{100}$	 $\frac{1}{1000}$

# Writing a Decimal



Discuss with a partner:

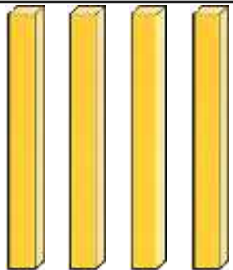
Do we have to write something even if the column is empty?

What?

Why?

tens	ones

•

tenths	hundredths	thousandths
		

0 . 0 4

# Writing a Decimal



Write the decimal number represented visually below.

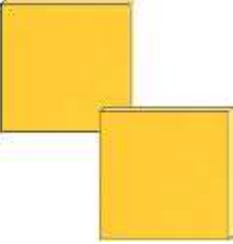
tens	ones		tenths	hundredths	thousandths
		•			  

0 . 0 0 8

# Writing a Decimal



Write the decimal number represented visually below.

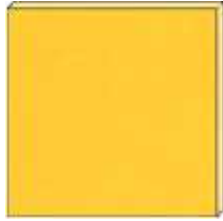
tens	ones		tenths	hundredths	thousandths
		•			

0 . 2

# Writing a Decimal



Write the decimal number represented visually below.

tens	ones		tenths	hundredths	thousandths
		•			

0 . 1 2



# Writing a Decimal

Write the decimal number represented visually below.

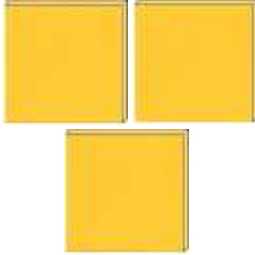
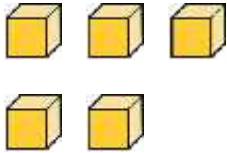


0 . 0 6 3

# Writing a Decimal



Write the decimal number represented visually below.

tens	ones		tenths	hundredths	thousandths
		•			

0 . 3 0 5

# Decimals as Fractions

Whole Class

Let's explore how we can write decimals as fractions.

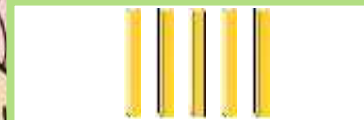
ones	tenths	hundredths	thousandths
0	3	5	8

This decimal number has three tenths.



$$0.3 = \frac{3}{10}$$

This decimal number has five hundredths.



$$0.35 = \frac{35}{100}$$

This decimal number has eight thousandths.



$$0.358 = \frac{358}{1000}$$

# Decimals as Fractions

Whole Class

Let's explore how we can write decimals as fractions.

ones	tenths	hundredths	thousandths
0	2	3	4

This decimal number has two tenths.



$$0.2 = \frac{2}{10}$$

This decimal number has three hundredths.



$$0.23 = \frac{23}{100}$$

This decimal number has four thousandths.



$$0.234 = \frac{234}{1000}$$

# Decimals as Fractions

Whole Class

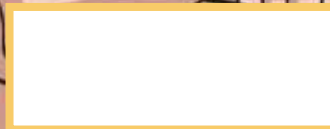
Let's explore how we can write decimals as fractions.

ones	tenths	hundredths	thousandths
0	0	4	6

This decimal number has zero tenths.

This decimal number has four hundredths.

This decimal number has six thousandths.



$$0.0 = \frac{0}{10}$$

$$0.04 = \frac{4}{100}$$

$$0.046 = \frac{46}{1000}$$

# What's My Number?

Sit back to back with your partner, so that one of you can see the whiteboard and the other one can't.

The person facing the whiteboard will have 30 seconds to describe the decimal number shown on the board using the language of tenths, hundredths and thousandths.

Score 1 point if the other person writes the correct fraction equivalent on their individual whiteboard.

Swap roles for the next round.



# What's My Number?



## Round 1

0.378

$$\begin{array}{r} 378 \\ \hline 1000 \end{array}$$

# What's My Number?



## Round 2

0.024

$$\begin{array}{r} 24 \\ \hline 1000 \end{array}$$



# What's My Number?



## Round 3

0.809

$$\begin{array}{r} 809 \\ \hline 1000 \end{array}$$

# What's My Number?

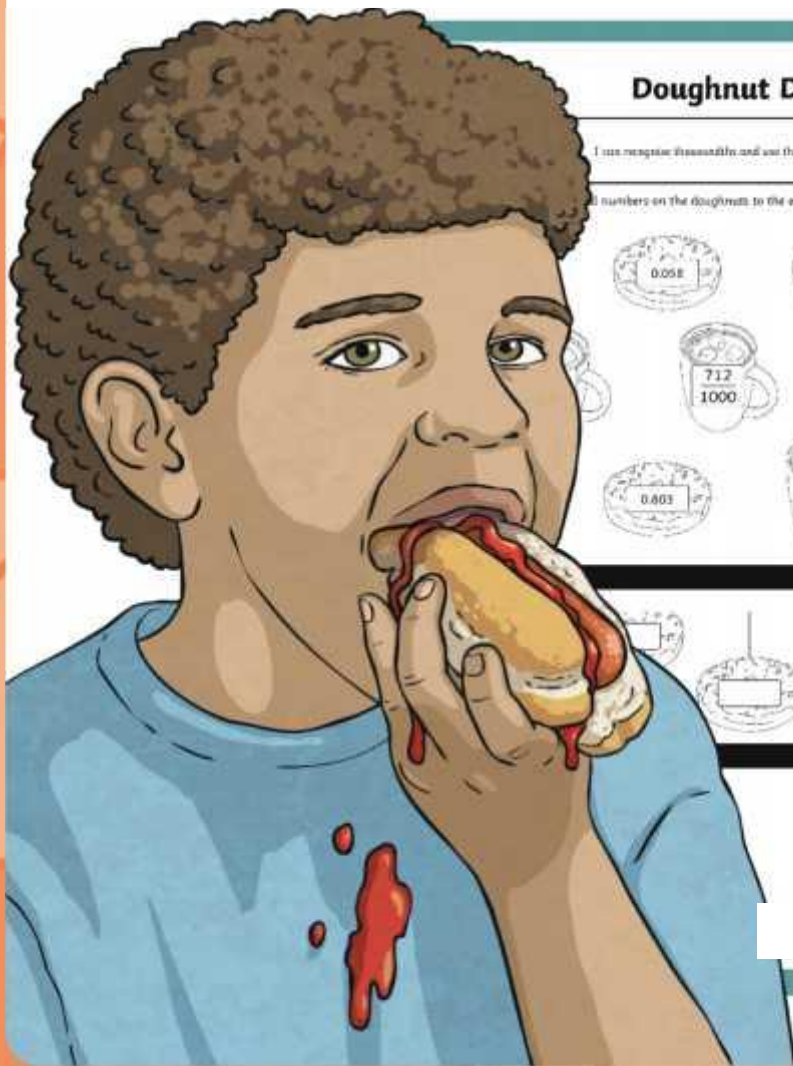


## Round 4

0.001

$\frac{1}{1000}$

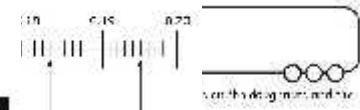
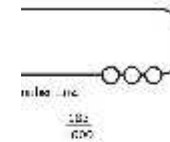
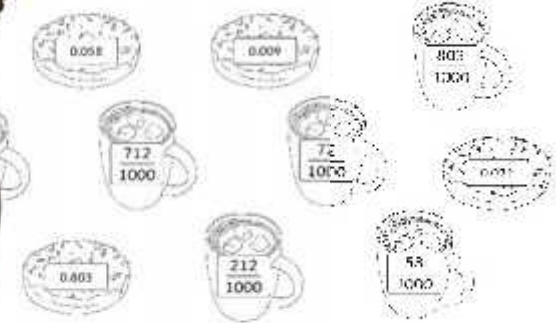
# Doughnut Decimals



## Doughnut Decimals

Use regular donut holes and use them as decimals and fractions.

Write the numbers on the doughnut to the equivalent fraction on the cup of donut holes.



1	182	$\frac{182}{1000}$
5	910	$\frac{910}{1000}$

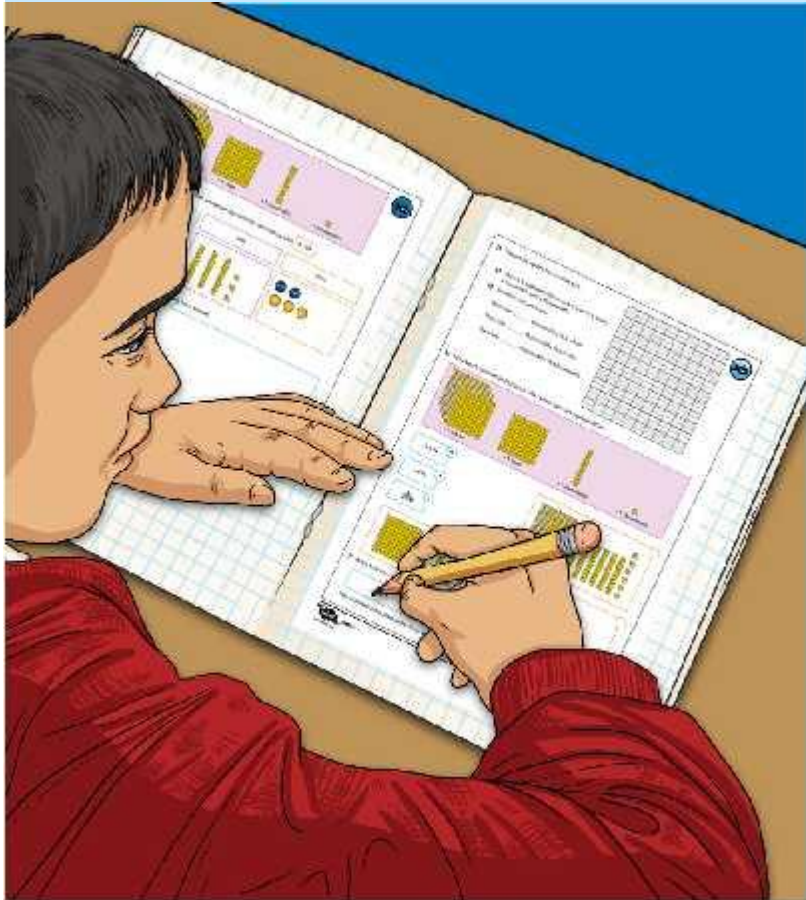
0.058	
0.048	0.051
$\frac{173}{1000}$	

0.091	0.094
$\frac{105}{1000}$	

0.049	$\frac{87}{1000}$
0.044	0.041

## Diving into Mastery

Dive in by completing your own activity!



2) This whole square has a value of 1.

**A)** Choose 1 different column and place in 1 tenth, 1 hundredth and 1 thousandth.

**M)** Complete the sentences:

There are \_\_\_\_\_ thousandths in a tenth.

There are \_\_\_\_\_ hundredths in a tenth.

There are \_\_\_\_\_ thousandths in a hundredth.

2) Match each decimal or fraction to the correct base ten representation.

$0.216$     $1.024$     $\frac{1}{1000}$

$\frac{1}{10}$     $\frac{1}{100}$     $\frac{1}{1000}$

3) Draw base ten representations to show these decimal numbers or fractions.

$0.216$    1 tenth, 2 hundredths and 6 thousandths    $\frac{1}{10} + \frac{2}{100} + \frac{6}{1000}$

You will need some plain paper to do this.

A screenshot of a digital math activity interface. The interface is white with a blue header and footer. It contains several sections: a grid for base ten blocks, a list of questions, and a sidebar with navigation buttons. The questions are: 1) This whole square has a value of 1. A) Choose 1 different column and place in 1 tenth, 1 hundredth and 1 thousandth. M) Complete the sentences: There are \_\_\_\_\_ thousandths in a tenth. There are \_\_\_\_\_ hundredths in a tenth. There are \_\_\_\_\_ thousandths in a hundredth. 2) Match each decimal or fraction to the correct base ten representation. Below this are three base ten representations: a large cube (1 whole), a flat (1 tenth), a rod (1 hundredth), and a small cube (1 thousandth). Below these are three decimal numbers: 0.216, 1.024, and 1/1000. To the right of these are three fractions: 1/10, 1/100, and 1/1000. 3) Draw base ten representations to show these decimal numbers or fractions. Below this are three boxes: 0.216, 1 tenth, 2 hundredths and 6 thousandths, and 1/10 + 2/100 + 6/1000. At the bottom, it says 'You will need some plain paper to do this.' The sidebar on the right has a pink button labeled '1 thousandth', a text input field with '201', and several colored buttons (blue, yellow, red).

# Doughnut Decimal Loops



$\frac{66}{1000}$	0.008	$\frac{8}{100}$	0.088
$\frac{80}{100}$	0.8	$\frac{63}{100}$	0.66
$\frac{60}{100}$	0.06	$\frac{80}{100}$	0.08
$\frac{88}{100}$	0.88	$\frac{60}{100}$	0.06

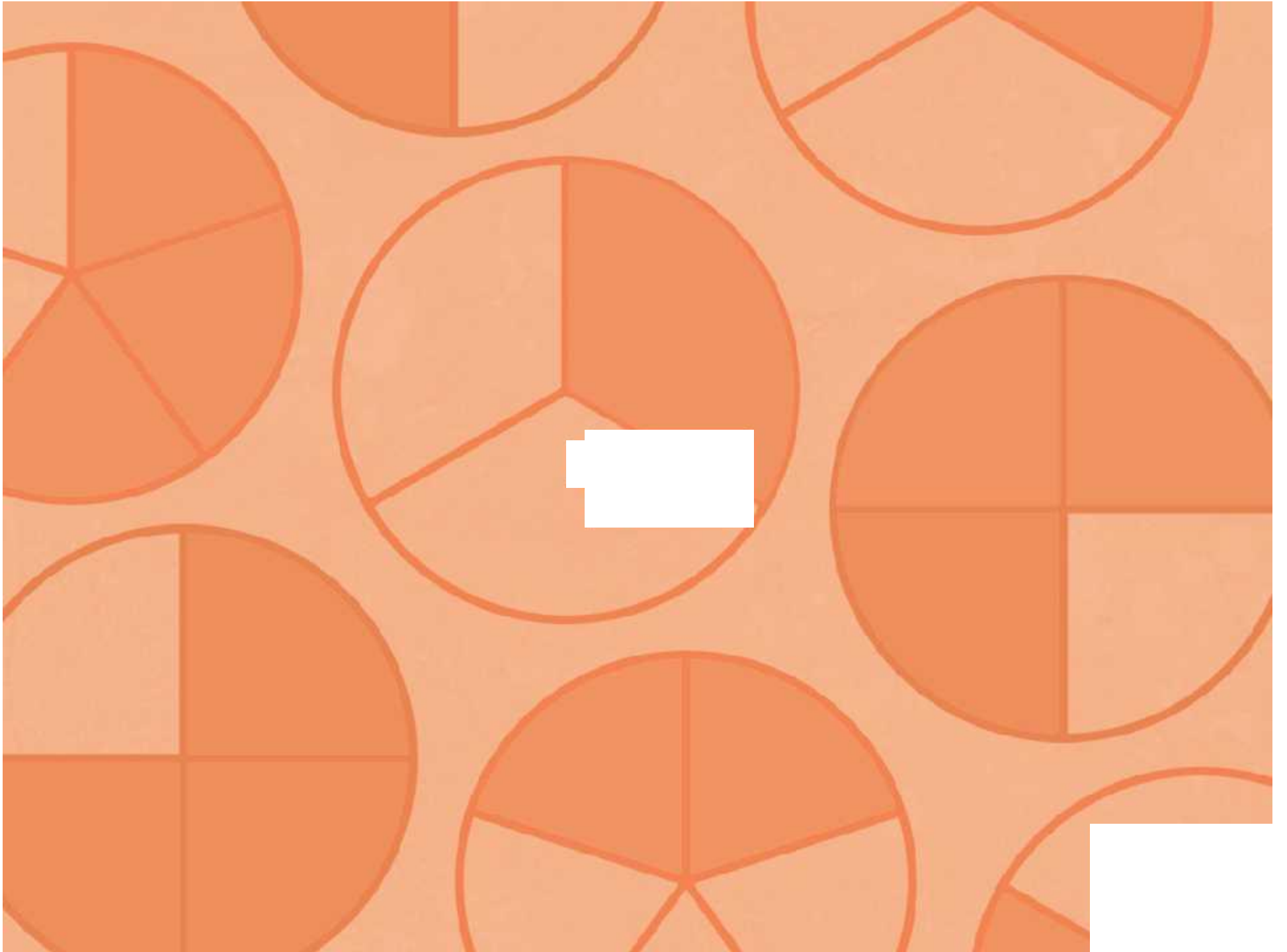
# Aim



- I can recognise thousandths and use them as decimals and fractions.

# Success Criteria

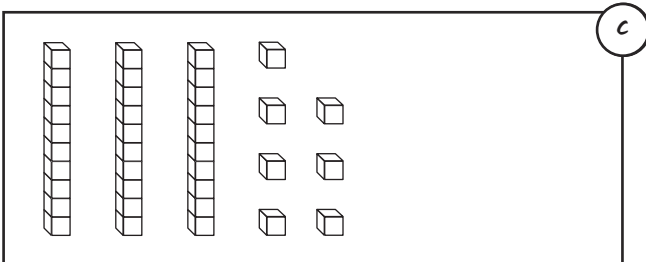
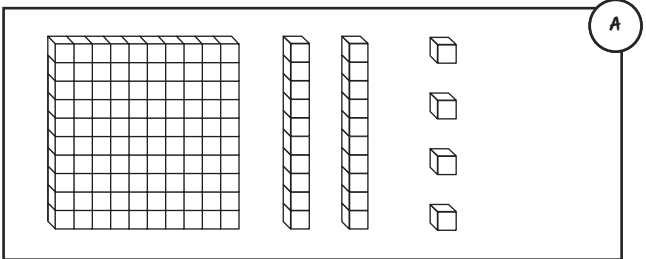
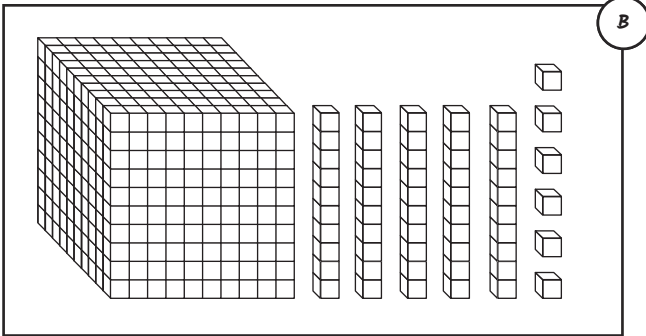
- I can identify thousandths.
- I can write decimal numbers with thousandths as fractions using a denominator of one thousand.





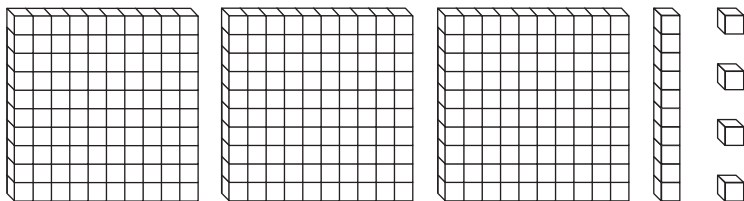
- 1) a) *Tenth* - children should have coloured in 1 complete row or column; some may have chosen to colour in 10 hundredths that are not positioned adjacent to each other to give a total of  $\frac{1}{10}$ .  
*Hundredth* - children should have coloured in 1 small square (10 thousandths).  
*Thousandth* - children should have coloured in 1 of the thousandths.
- b) There are 1000 thousandths in a whole.  
 There are 100 thousandths in a tenth.  
 There are 10 thousandths in a hundredth.

2)

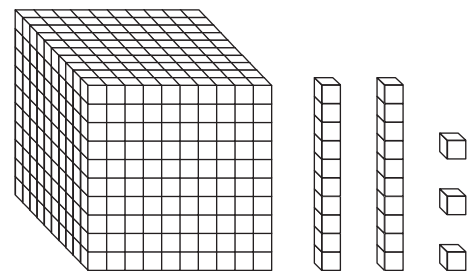


3)

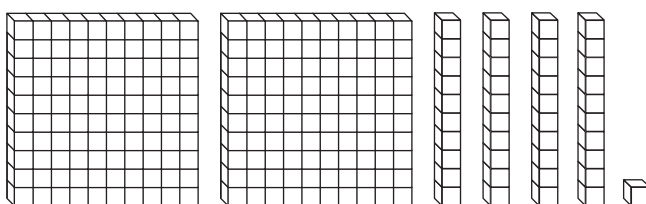
0.314



1 whole, 2 hundredths and 3 thousandths



$$\frac{2}{10} + \frac{4}{100} + \frac{1}{1000}$$

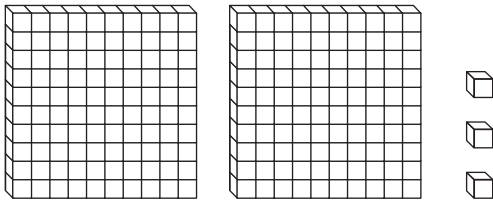






1) Remi and Jake have made mistakes.

Jake has represented 0.033 in his drawing. He should have drawn:



Remi has represented 0.302 in his drawing. He should have drawn:



Possible answers include the following:

$$\frac{2}{10} + \frac{3}{1000}$$

two-tenths and three-thousandths

$$0.2 + 0.003$$



1) There are three solutions:

0.251  
0.472  
0.693

2) Possible answers include:

0.321  
0.467  
0.589

0.378  
0.469  
0.521

0.398  
0.412  
0.567

3) 3.532, 3.533, 3.534, 3.535  
7.317, 7.318, 7.319, 7.32  
7.652, 7.653, 7.654, 7.655  
6.497, 6.498, 6.499, 6.5



1) This whole square has a value of 1.

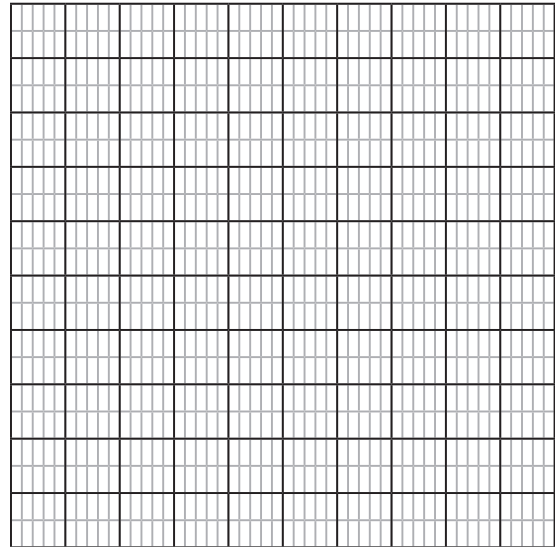
a) Choose 3 different colours and colour in 1 tenth, 1 hundredth and 1 thousandth.

b) Complete the sentences.

There are \_\_\_\_\_ thousandths in a whole.

There are \_\_\_\_\_ thousandths in a tenth.

There are \_\_\_\_\_ thousandths in a hundredth.



2) Match each decimal or fraction to the correct base ten representation.

= 1 whole      = 1 tenth      = 1 hundredth      = 1 thousandth

0.124 **A**

1.056 **B**

$\frac{37}{1000}$  **C**

3) Draw base ten representations to show these decimal numbers or fractions.

0.314

1 whole, 2 hundredths and 3 thousandths

$\frac{2}{10} + \frac{4}{100} + \frac{1}{1000}$

You will need some plain paper to do this.



= 1 whole      = 1 tenth      = 1 hundredth      = 1 thousandth

1) Trudy, Jake and Remi have drawn images to represent the decimal number **0.203**.

Trudy

Jake

Remi

Who has made an error? What should they have drawn?

2) Partition 0.203 in three different ways.

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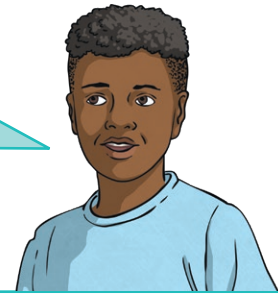
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1) Jerry has written a decimal number.

My number has no whole ones.  
 The tenths digit is double the thousandths digit.  
 The hundredths digit is 3 more than the tenths digit.



Find all possible solutions.

2) Using the digit cards only once, create 3 different decimal numbers with 3 decimal places. Each number must be greater than 0.3 but less than 0.6. Find all 3 possible sets of numbers.



0.\_\_\_\_

0.\_\_\_\_

0.\_\_\_\_

0.\_\_\_\_

0.\_\_\_\_

0.\_\_\_\_

0.\_\_\_\_

0.\_\_\_\_

0.\_\_\_\_

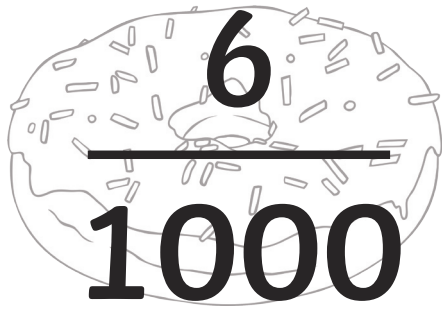
3) Counting in thousandths, write the next 3 consecutive numbers.

3.532    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

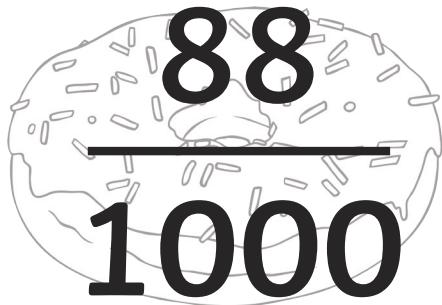
7.317    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

2.652    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_

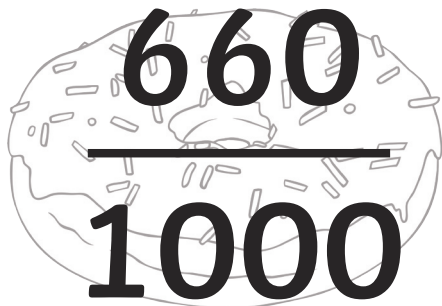
6.497    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_


$$\frac{6}{1000}$$

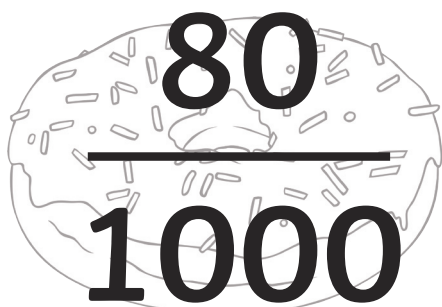

$$0.088$$


$$\frac{88}{1000}$$

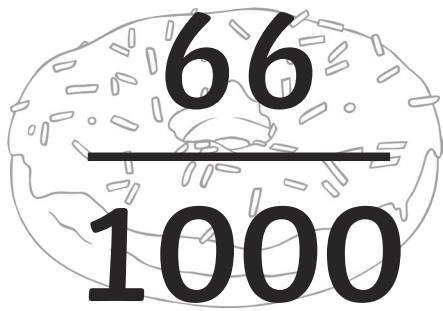

$$0.66$$


$$\frac{660}{1000}$$

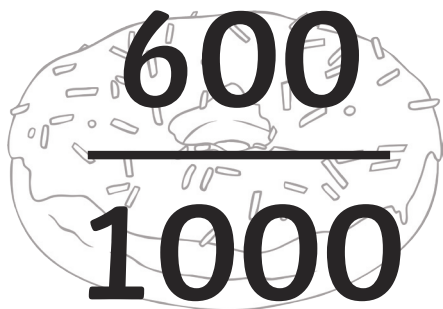

$$0.08$$


$$\frac{80}{1000}$$

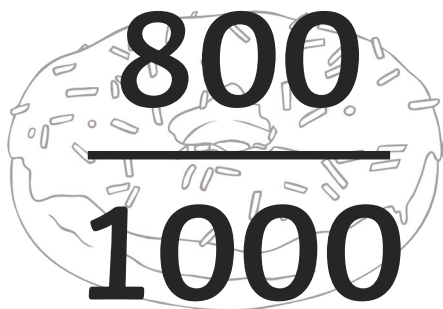

$$0.6$$


$$\frac{66}{1000}$$

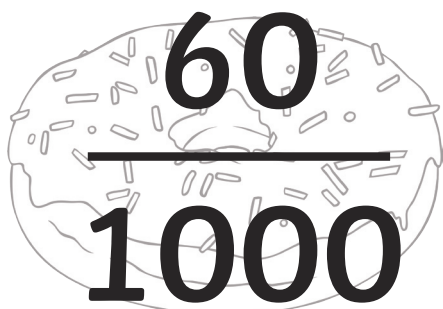

$$0.008$$


$$\frac{600}{1000}$$

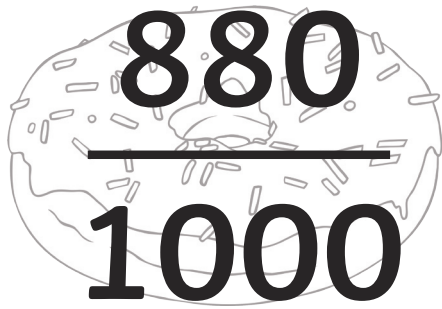

$$0.8$$


$$\frac{800}{1000}$$

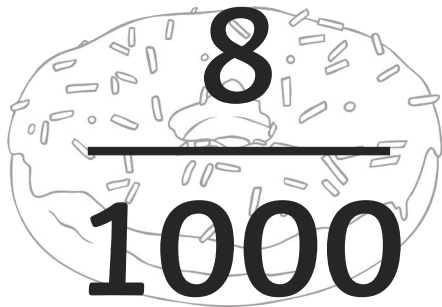

$$0.06$$


$$\frac{60}{1000}$$


$$0.88$$


$$\frac{880}{1000}$$


$$0.066$$


$$\frac{8}{1000}$$


$$0.006$$

### On the Beach Decimal Loop Cards - Answers

$$\frac{6}{1000} = 0.006$$

$$\frac{66}{1000} = 0.066$$

$$\frac{880}{1000} = 0.88$$

$$\frac{88}{1000} = 0.088$$

$$\frac{600}{1000} = 0.6$$

$$\frac{8}{1000} = 0.008$$

$$\frac{660}{1000} = 0.66$$

$$\frac{800}{1000} = 0.8$$

$$\frac{80}{1000} = 0.08$$

$$\frac{60}{1000} = 0.06$$

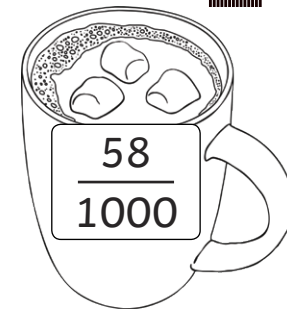
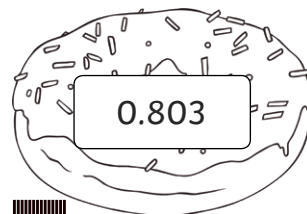
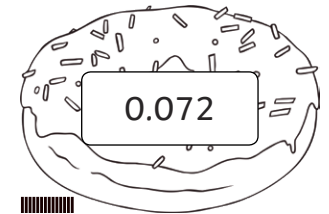
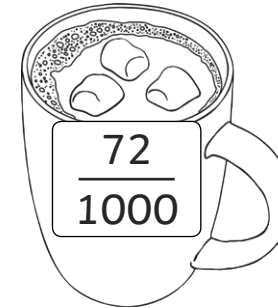
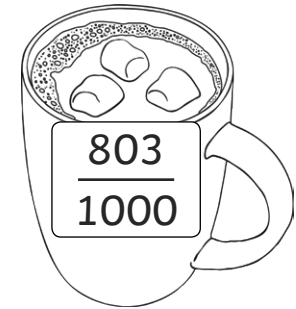
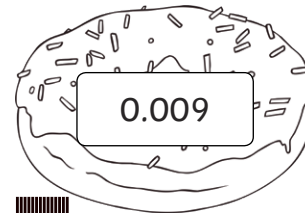
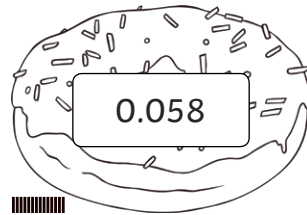


# Doughnut Decimals

I can recognise thousandths and use them as decimals and fractions.



Match the decimal numbers on the doughnuts to the equivalent fraction on a mug of hot chocolate.





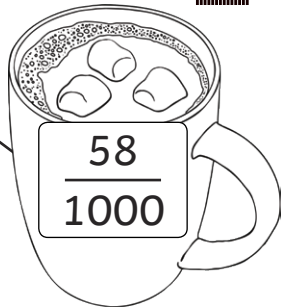
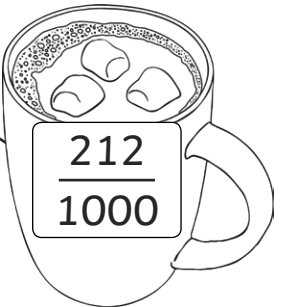
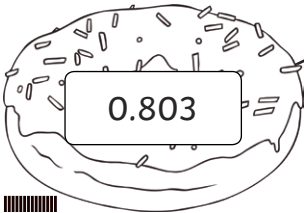
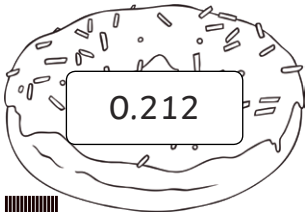
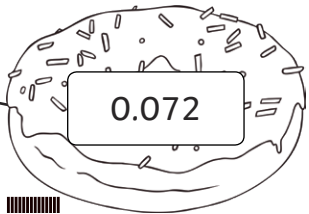
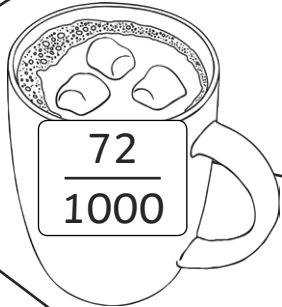
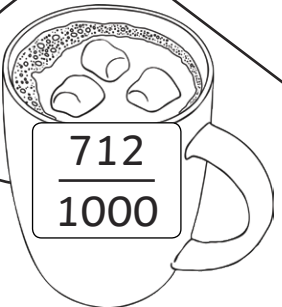
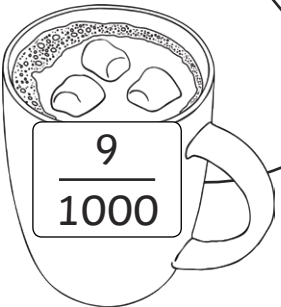
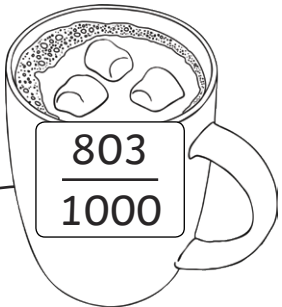
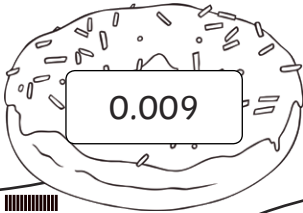
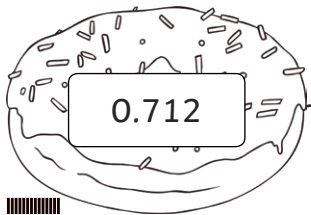


# Doughnut Decimals Answers

I can recognise thousandths and use them as decimals and fractions.



Match the decimal numbers on the doughnuts to the equivalent fraction on a mug of hot chocolate.





# Doughnut Decimals

I can recognise thousandths and use them as decimals and fractions.



Convert the fractions into decimals and then place them on the correct doughnut on the number line.

$$\frac{195}{1000} =$$

$$\frac{123}{1000} =$$

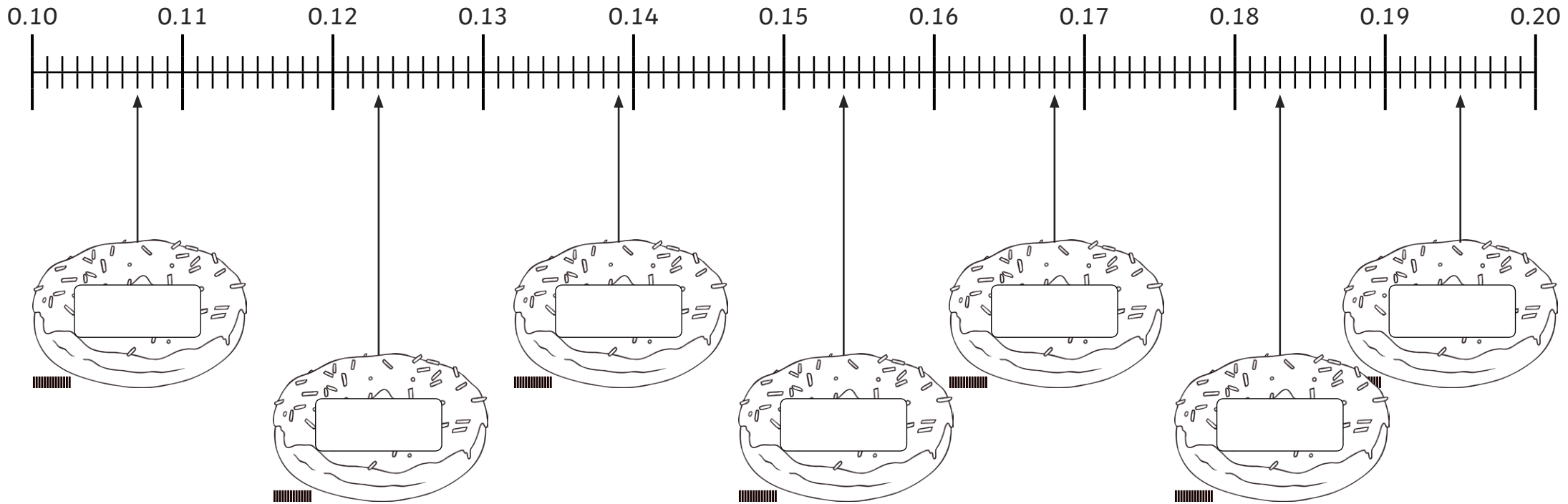
$$\frac{154}{1000} =$$

$$\frac{107}{1000} =$$

$$\frac{139}{1000} =$$

$$\frac{168}{1000} =$$

$$\frac{183}{1000} =$$





# Doughnut Decimals Answers

I can recognise thousandths and use them as decimals and fractions.



Convert the fractions into decimals and then place them on the correct doughnut on the number line.

$$\frac{195}{1000} = 0.195$$

$$\frac{123}{1000} = 0.123$$

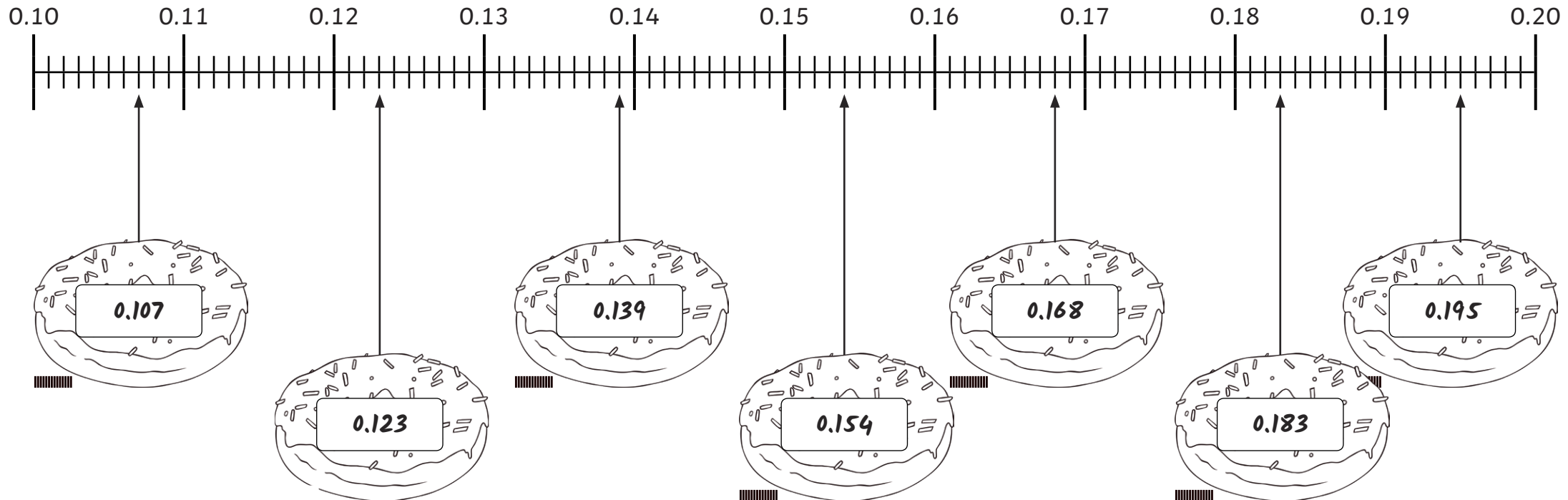
$$\frac{154}{1000} = 0.154$$

$$\frac{107}{1000} = 0.107$$

$$\frac{139}{1000} = 0.139$$

$$\frac{168}{1000} = 0.168$$

$$\frac{183}{1000} = 0.183$$












# Doughnut Decimals



I can recognise thousandths and use them as decimals and fractions.


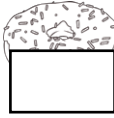






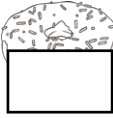
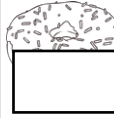
When added together, each row and column totals 1 which is equivalent to  $\frac{1000}{1000}$ . Write the missing decimals on the doughnuts and the missing fractions on the hot chocolates to complete each grid.






	0.319	
<input type="text"/>		<input type="text"/>
0.341	$\frac{343}{1000}$	
<input type="text"/>	<input type="text"/>	$\frac{258}{1000}$

$\frac{537}{1000}$		
<input type="text"/>		<input type="text"/>
	0.246	
0.173	<input type="text"/>	$\frac{492}{1000}$

	0.423	$\frac{541}{1000}$
<input type="text"/>		<input type="text"/>
0.705		0.103
<input type="text"/>	<input type="text"/>	<input type="text"/>

	0.152	
<input type="text"/>		<input type="text"/>
	0.546	0.381
<input type="text"/>	<input type="text"/>	<input type="text"/>
$\frac{173}{1000}$		
<input type="text"/>	<input type="text"/>	<input type="text"/>

	$\frac{271}{1000}$	
<input type="text"/>		<input type="text"/>
0.641		0.301
<input type="text"/>	<input type="text"/>	<input type="text"/>
$\frac{182}{1000}$		
<input type="text"/>	<input type="text"/>	<input type="text"/>

0.309	$\frac{371}{1000}$	
<input type="text"/>		<input type="text"/>
		
<input type="text"/>	<input type="text"/>	<input type="text"/>
0.208	0.511	
<input type="text"/>	<input type="text"/>	<input type="text"/>



# Doughnut Decimals Answers

I can recognise thousandths and use them as decimals and fractions.



When added together, each row and column totals 1 which is equivalent to  $\frac{1000}{1000}$ . Write the missing decimals on the doughnuts and the missing fractions on the hot chocolates to complete each grid.

$\frac{255}{1000}$	0.319	$\frac{426}{1000}$
0.341	$\frac{343}{1000}$	0.316
$\frac{404}{1000}$	0.338	$\frac{258}{1000}$

$\frac{537}{1000}$	0.419	$\frac{44}{1000}$
$\frac{290}{1000}$	0.246	0.464
0.173	0.335	$\frac{492}{1000}$

$\frac{36}{1000}$	0.423	$\frac{541}{1000}$
0.705	0.192	0.103
$\frac{259}{1000}$	0.385	0.356

0.754	0.152	$\frac{94}{1000}$
0.073	0.546	0.381
$\frac{173}{1000}$	0.302	$\frac{525}{1000}$

$\frac{177}{1000}$	$\frac{271}{1000}$	$\frac{552}{1000}$
0.641	0.058	0.301
$\frac{182}{1000}$	0.671	0.147

0.309	$\frac{371}{1000}$	$\frac{320}{1000}$
$\frac{483}{1000}$	0.118	0.399
0.208	0.511	$\frac{281}{1000}$

Fractions | Doughnut Decimals

<b>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</b>		
I can identify thousandths.		
I can write decimal numbers with thousandths as fractions using a denominator of one thousand.		

Fractions | Doughnut Decimals

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I can identify thousandths.		
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Fractions | Doughnut Decimals

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