Decimals

Master The Curriculum

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Fluency & Reasoning Teaching Slides

Adding Decimals within 1

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Fluency Teaching Slides

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Activity 1 Adding Decimals within 1

Use this place value chart to help answer the questions.

Ones	Tenths	Hundredths	Thousandths
	0.1 0.1 0.1 0.1	0.01	0.001 0.001

What number is 1 hundredth more? ☐

Add 0.3, what number do you have now? ☐

How many more thousandths can I add before the hundredths digit changes? ☐

?

What is the number represented on the place value chart?

Activity 1 Adding Decimals within 1

Use this place value chart to help answer the questions.

Ones	Tenths	Hundredths	Thousandths
	0.1 0.1 0.1 0.1	0.01	0.001 0.001

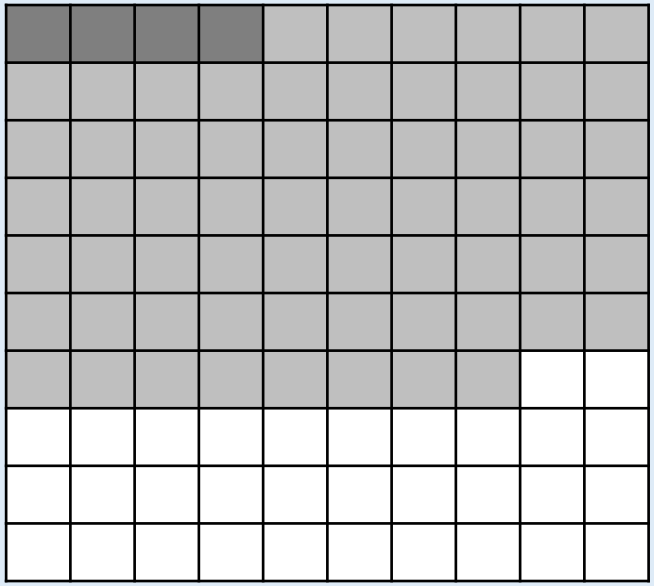
What number is 1 hundredth more? 0.422

Add 0.3, what number do you have now? 0.722

How many more thousandths can I add before the hundredths digit changes? 8

Activity 2 Adding Decimals within 1

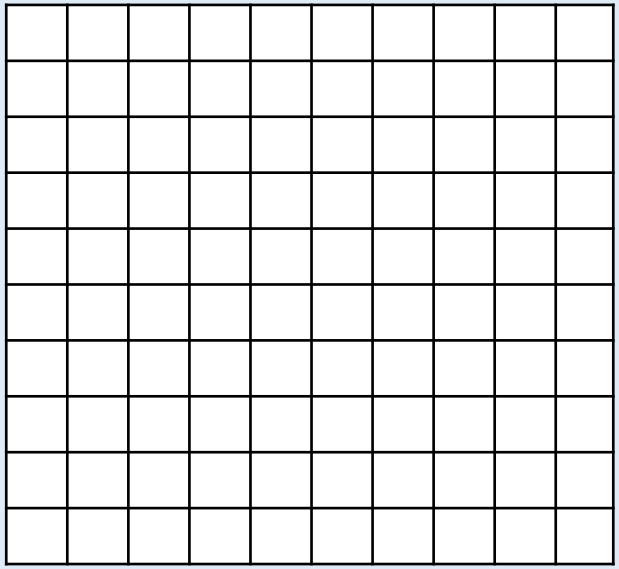
Each box represents 1 hundredth of the whole.
This square shows the calculation shaded and added.



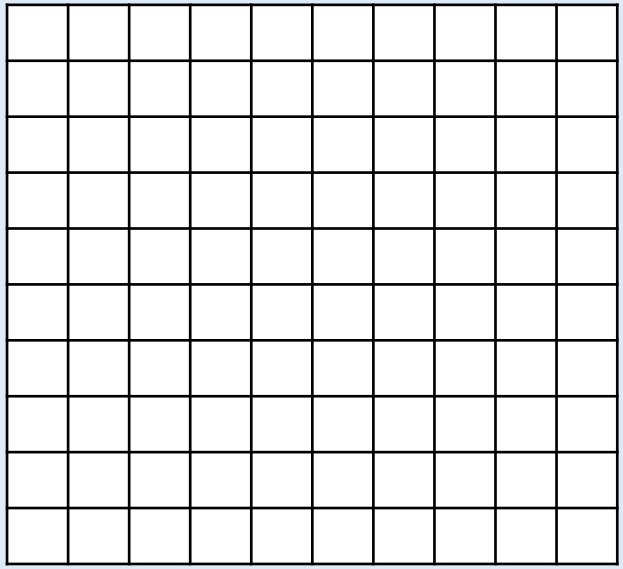
$$0.04 + 0.64 = 0.68$$

Activity 2 Adding Decimals within 1

Each box in this hundred square represents 1 hundredth of the whole. Use this to answer:



0.04 + 0.64



0.07 + 0.78

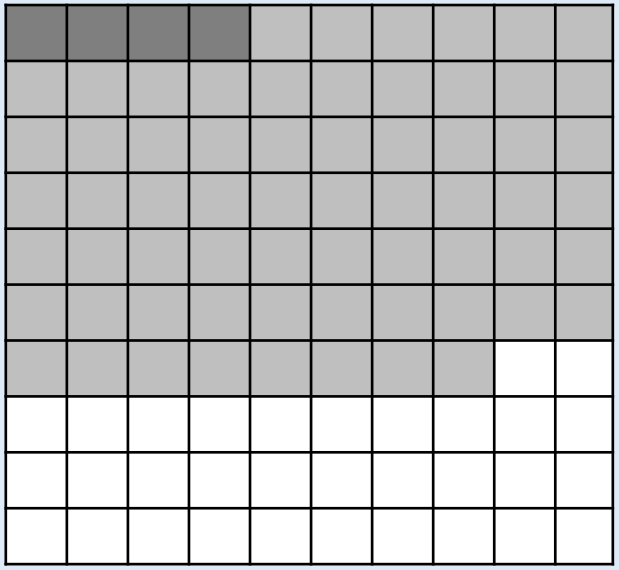
?

How can you shade in the hundred square to support your calculations?

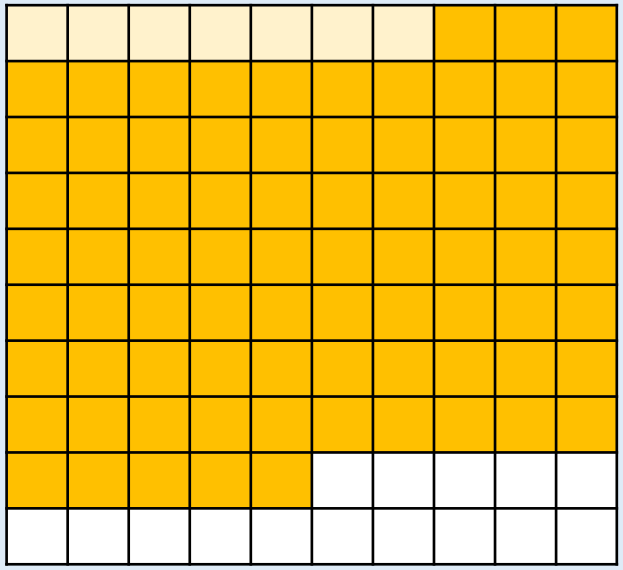
Activity 2

Adding Decimals within 1

Each box in this hundred square represents 1 hundredth of the whole. Use this to answer:



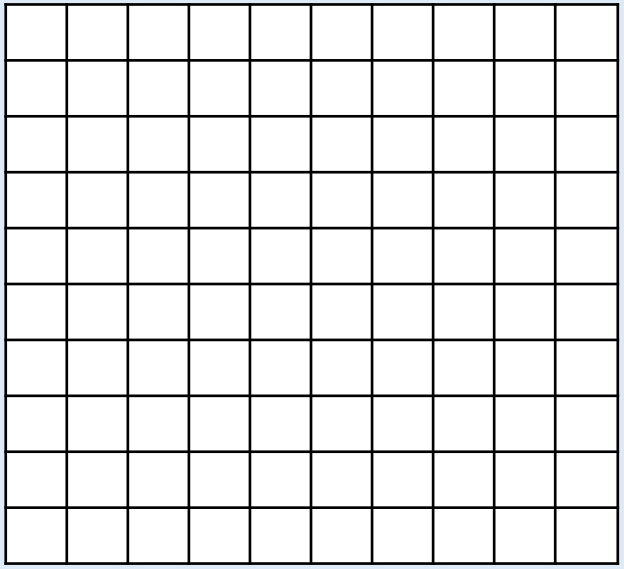
0.04 + 0.64



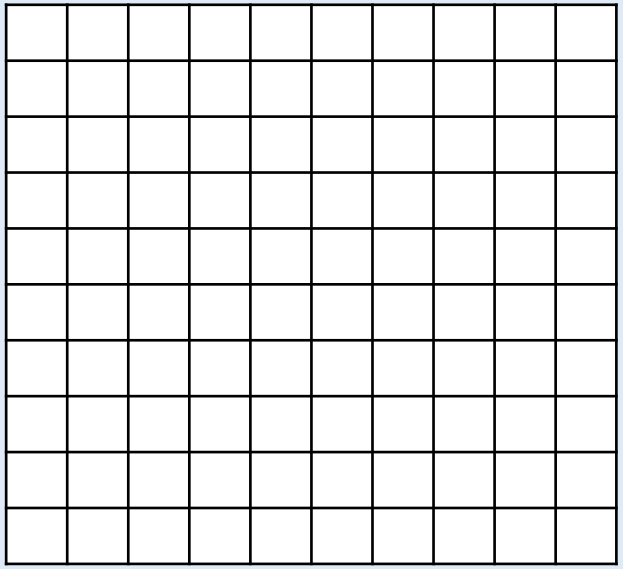
0.07 + 0.78

Activity 3 Adding Decimals within 1

Each box in this hundred square represents 1 hundredth of the whole. Use this to answer:



0.07 + 0.35

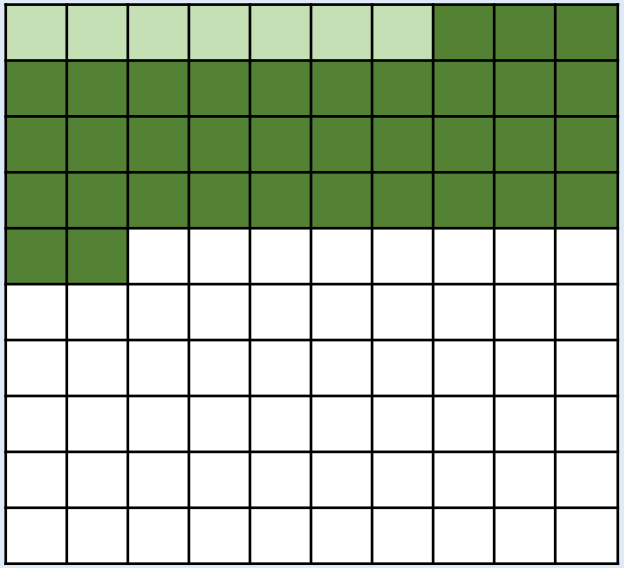


0.26 + 0.01

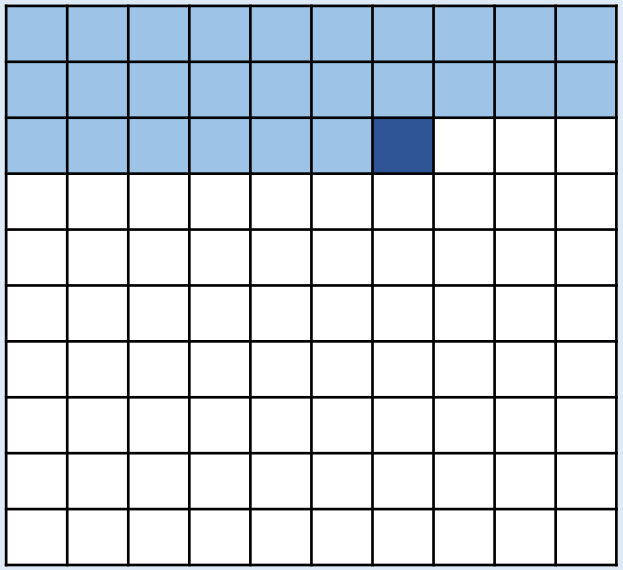
Activity 3

Adding Decimals within 1

Each box in this hundred square represents 1 hundredth of the whole. Use this to answer:



0.07 + 0.35



0.26 + 0.01

Activity 4 Adding Decimals within 1

Use the column method to complete the additions.

0.35 + 0.5

0.35 + 0.05

0.45 + 0.05

0.45 + 0.005

?

Why does using column addition support adding decimals?

Activity 4 Adding Decimals within 1

Use the column method to complete the additions.

0.35 + 0.5

$$\begin{array}{r} 0.35 \\ +\ 0.5 \\ \hline 0.85 \end{array}$$

0.35 + 0.05

$$\begin{array}{r} 0.35 \\ +\ 0.05 \\ \hline 0.40 \\ 1 \end{array}$$

0.45 + 0.05

$$\begin{array}{r} 0.45 \\ +\ 0.05 \\ \hline 0.50 \\ 1 \end{array}$$

0.45 + 0.005

$$\begin{array}{r} 0.45 \\ +\ 0.005 \\ \hline 0.455 \end{array}$$

Reasoning 1

Adding Decimals within 1

What mistake has Zach made?

Zach

0.41 + 0.3 = 0.413

Use at least two representations to show why he is incorrect.

Reasoning 1 Adding Decimals within 1

What mistake has Zach made?

Zach

0.41 + 0.3 = 0.413

Use at least two representations to show why he is incorrect.

Zach has put the 3 tenths in the thousandths place.

The correct answer is 0.71.

Reasoning 2 Adding Decimals within 1

Compare the number sentences using <, > or =.

$0.7 + 0.03 + 0.001$ ☐ $0.07 + 0.3 + 0.1$

$0.4 + 0.1 + 0.05$ ☐ $0.3 + 0.2 + 0.05$

$0.2 + 0.05 + 0.005$ ☐ $0.5 + 0.2 + 0.05$

Reasoning 2 Adding Decimals within 1

Compare the number sentences using <, > or =.

$0.7 + 0.03 + 0.001 \quad > \quad 0.07 + 0.3 + 0.1$

$0.4 + 0.1 + 0.05 \quad = \quad 0.3 + 0.2 + 0.05$

$0.2 + 0.05 + 0.005 \quad < \quad 0.5 + 0.2 + 0.05$

Reasoning 3 Adding Decimals within 1

Esin has some digit cards.

0	1	2	3	4	5

She uses each card once to make a number sentence.

$$\begin{array}{r} 0.\square\square\square \\ +\ 0.\square\square\square \\ \hline \square. \end{array}$$

What is the largest number she can make?

What is the smallest?

Reasoning 3 Adding Decimals within 1

Esin has some digit cards.

0 1 2 3 4 5

She uses each card once to make a number sentence.

$$0.531 + 0.420 = 0.951$$

What is the largest number she can make?

What is the smallest?

Largest

Reasoning 3 Adding Decimals within 1

Esin has some digit cards.

0	1	2	3	4	5

She uses each card once to make a number sentence.

$$\begin{array}{r} 0.135 \\ +\ 0.024 \\ \hline 0.159 \end{array}$$

What is the largest number she can make?

What is the smallest?

Smallest

Discuss

Adding Decimals within 1

What is the number represented on the place value chart?

What digit changes when I add a hundredth?

How many hundredths can I add before the tenths place changes? Explain why.

How can you shade in the hundred square to support your calculations?

Why does using column addition support adding decimals? What is the same and what is different?

Subtracting Decimals within 1

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Activity 1 Subtracting Decimals within 1

Here is a number.

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

What is 3 tenths less than the number?

Take away 0.02, what is your number now?

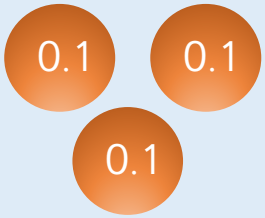
Subtract 5 thousandths. What is the final number?

?

What is the number represented on the place value chart?

Activity 1 Subtracting Decimals within 1

Here is a number.

Ones	Tenths	Hundredths	Thousandths
			

What is 3 tenths less than the number? 0.044

Take away 0.02, what is your number now? 0.024

Subtract 5 thousandths. What is the final number? 0.019

Activity 2 Subtracting Decimals within 1

Here is a number.

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

What is 2 hundredths less than the number?

Take away 0.005, what is your number now?

Subtract 6 thousandths. What is the final number?

Activity 2 Subtracting Decimals within 1

Here is a number.

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

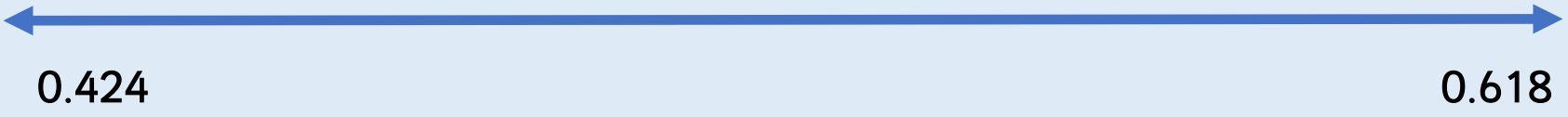
What is 2 hundredths less than the number? 0.216

Take away 0.005, what is your number now? 0.211

Subtract 6 thousandths. What is the final number? 0.205

Activity 3 Subtracting Decimals within 1

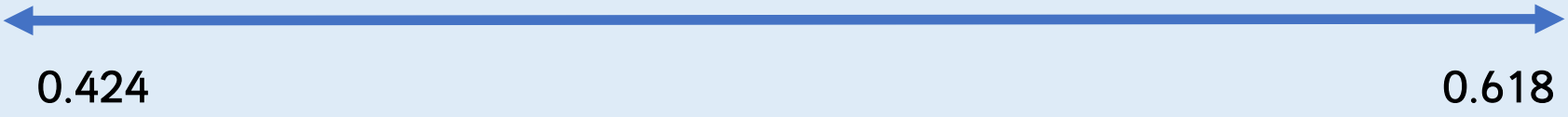
Find the difference between the two numbers using the number line.



$0.618 - 0.424 =$ ☐

Activity 3 Subtracting Decimals within 1

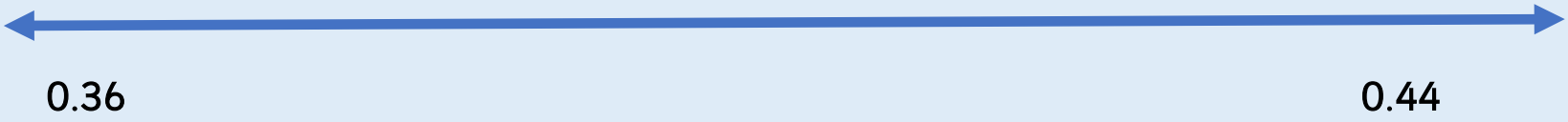
Find the difference between the two numbers using the number line.



0.618 – 0.424 = 0.194

Activity 4 Subtracting Decimals within 1

Find the difference between the two numbers using the number line.



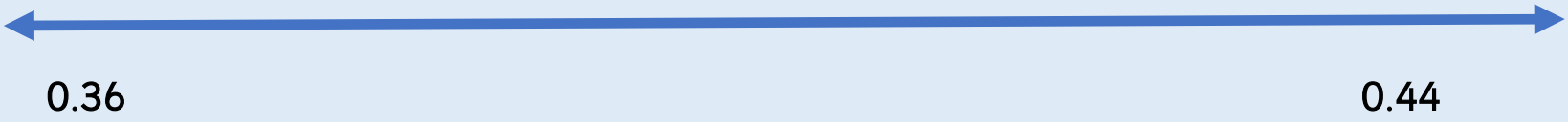
$0.44 - 0.36 =$ ☐

?

Can you explain how you have used the number line?

Activity 4 Subtracting Decimals within 1

Find the difference between the two numbers using the number line.



$0.44 - 0.36 =$ 0.08

Activity 5 Subtracting Decimals within 1

Calculate.

0.345 – 0.121	=		0.289 – 0.132	=	
0.685 – 0.255	=		0.582 – 0.159	=	
0.678 – 0.282	=		0.67 – 0.08	=	

?

What is 1 hundredth less than 1?

Activity 5 Subtracting Decimals within 1

Calculate.

0.345 – 0.121	=	0.224
0.685 – 0.255	=	0.43
0.678 – 0.282	=	0.396
0.289 – 0.132	=	0.157
0.582 – 0.159	=	0.423
0.67 – 0.08	=	0.59

Reasoning 1 Subtracting Decimals within 1

Here are four calculations.
Which one is the easiest to answer?
Which one is the trickiest to answer?
Explain your choice of order.

0.45 – 0.3 = ☐

0.45 – 0.15 = ☐

0.45 – 0.23 = ☐

0.45 – 0.18 = ☐

Reasoning 1 Subtracting Decimals within 1

Here are four calculations.
Which one is the easiest to answer?
Which one is the trickiest to answer?
Explain your choice of order.

0.45 – 0.3	=	0.15
0.45 – 0.15	=	0.3
0.45 – 0.23	=	0.22
0.45 – 0.18	=	0.27

Possible order:

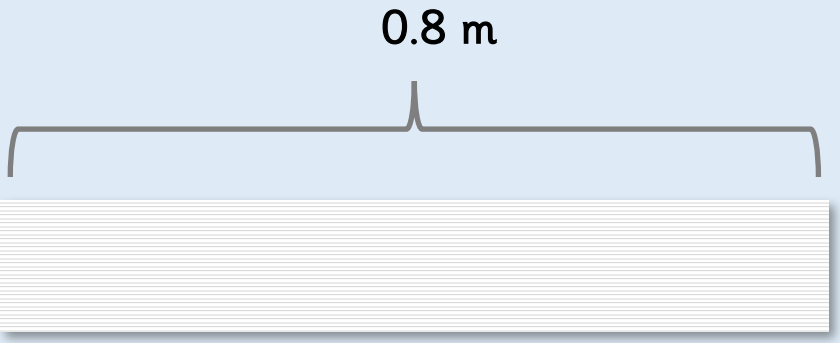
0.45 – 0.23 = 0.22
(no exchange)

0.45 – 0.15 = 0.3
(no exchange with 0)

0.45 – 0.3 = 0.15
(no exchange, different decimal place)

0.45 – 0.18 = 0.27
(exchange)

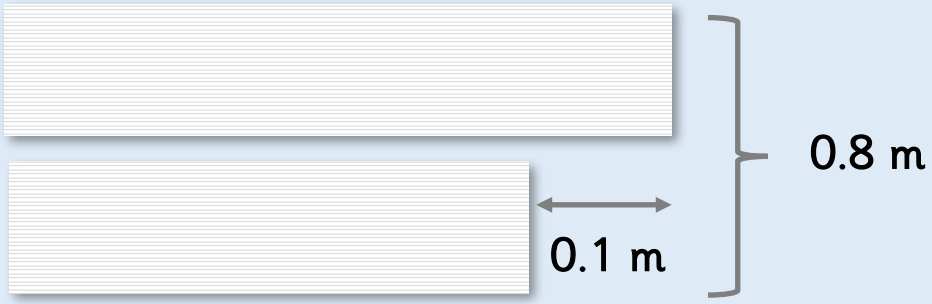
Reasoning 2 Subtracting Decimals within 1



The strip of paper is 0.8 m long.

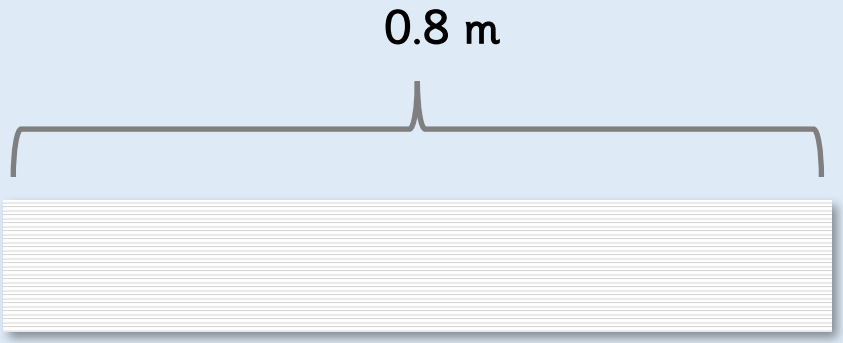
It is cut into two unequal parts.

The difference in lengths between the two strips of paper is 0.1 m.



How long are the two strips of paper?

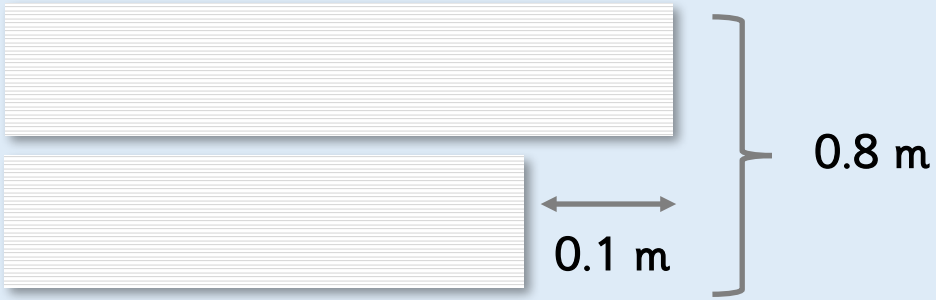
Reasoning 2 Subtracting Decimals within 1



The strip of paper is 0.8 m long.

It is cut into two unequal parts.

The difference in lengths between the two strips of paper is 0.1 m.



How long are the two strips of paper?

Strip 1: 0.45 m
Strip 2: 0.35 m

Discuss

Subtracting Decimals within 1

What is the number represented on the place value chart?

What is 1 tenth less than one?

What is 1 hundredth less than one?
Show me how you know.

If I'm taking away tenths, which digit will be affected?
Is this always the case?

How many hundredths can I take away before the tenths place is affected?

Complements to 1

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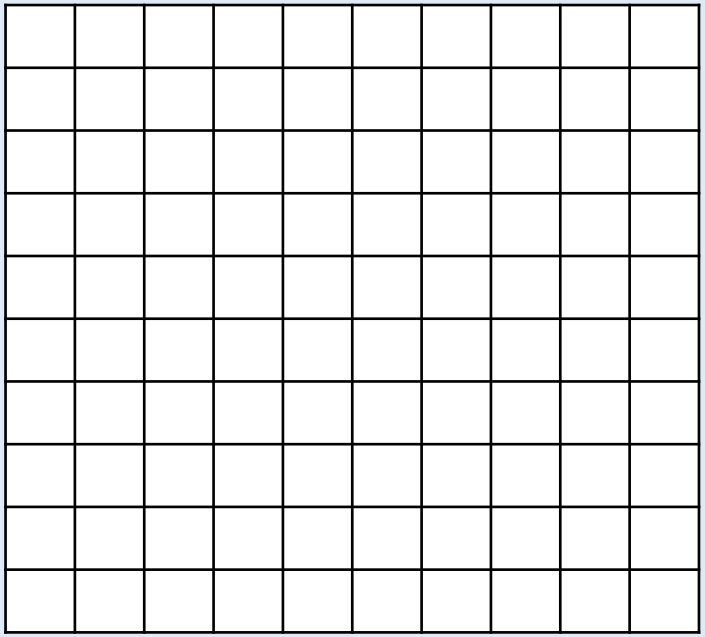
Activity 1 Complements to 1

Using a blank hundred square, where each square represents 1 hundredth, find the complements to 1 for these numbers.



$0.37 + \square = 1$

$\square + 0.65 = 1$

$1 = 0.25 + \square$

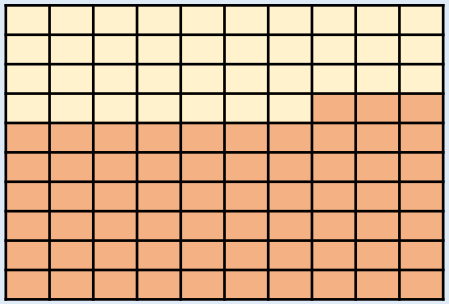
$0.82 + 0.08 + \square = 1$

?

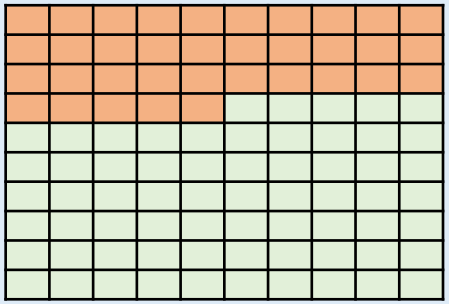
How can shading the hundred square help you find the complement to 1?

Activity 1 Complements to 1

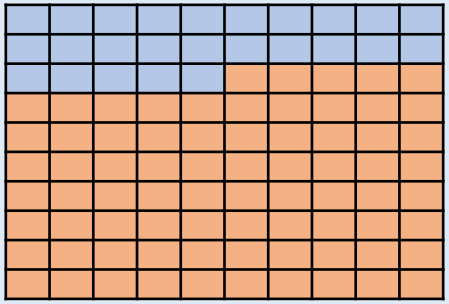
Using a blank hundred square, where each square represents 1 hundredth, find the complements to 1 for these numbers.



$0.37 + \boxed{0.63} = 1$



$\boxed{0.35} + 0.65 = 1$

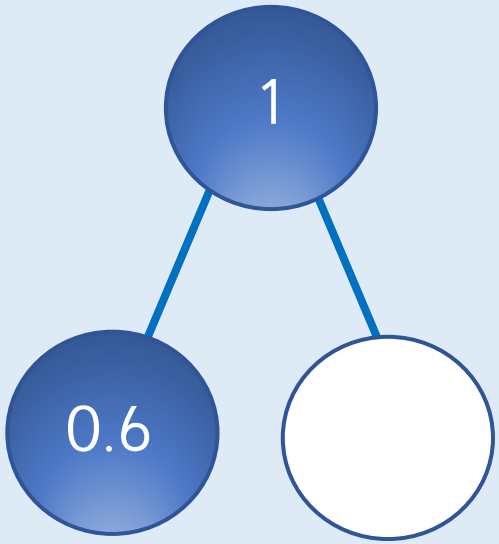


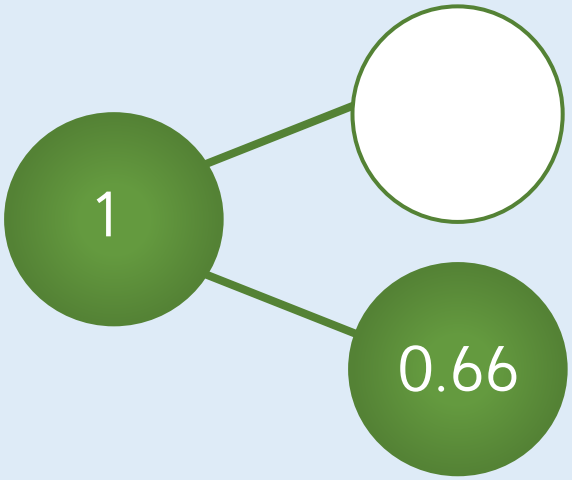
$1 = 0.25 + \boxed{0.75}$

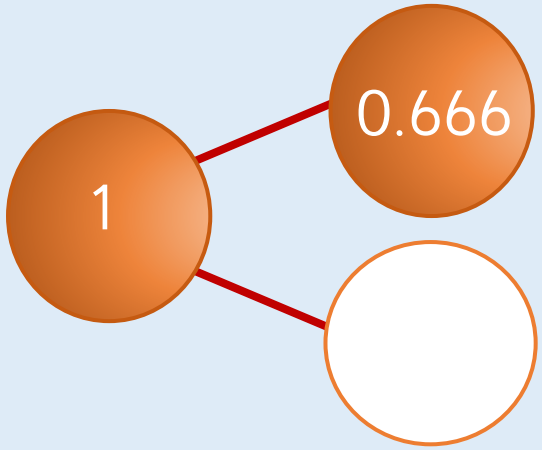
$0.82 + 0.08 + \boxed{0.10} = 1$

Activity 2 Complements to 1

Complete the part-whole models.





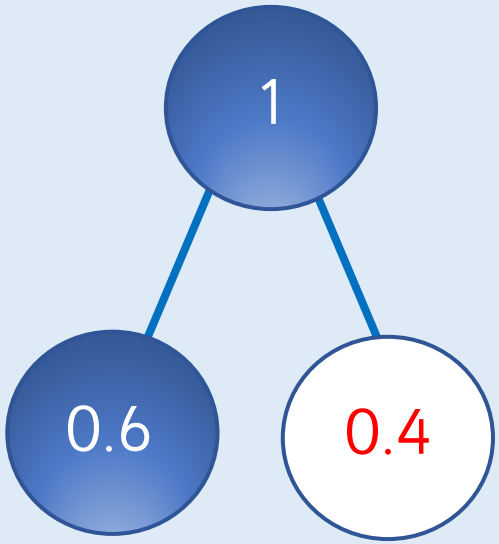


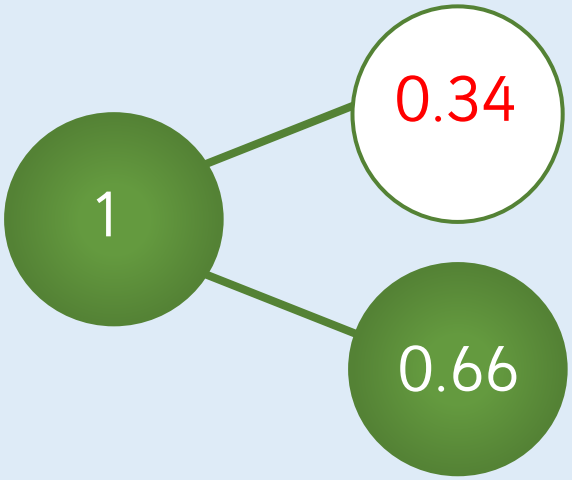
?

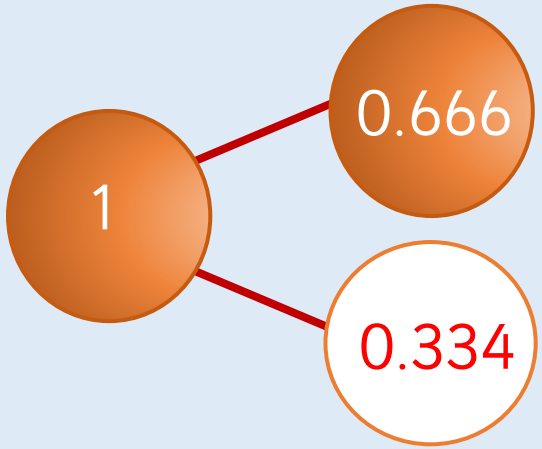
How many different ways can you make 1? How many ways do you think there are?

Activity 2 Complements to 1

Complete the part-whole models.

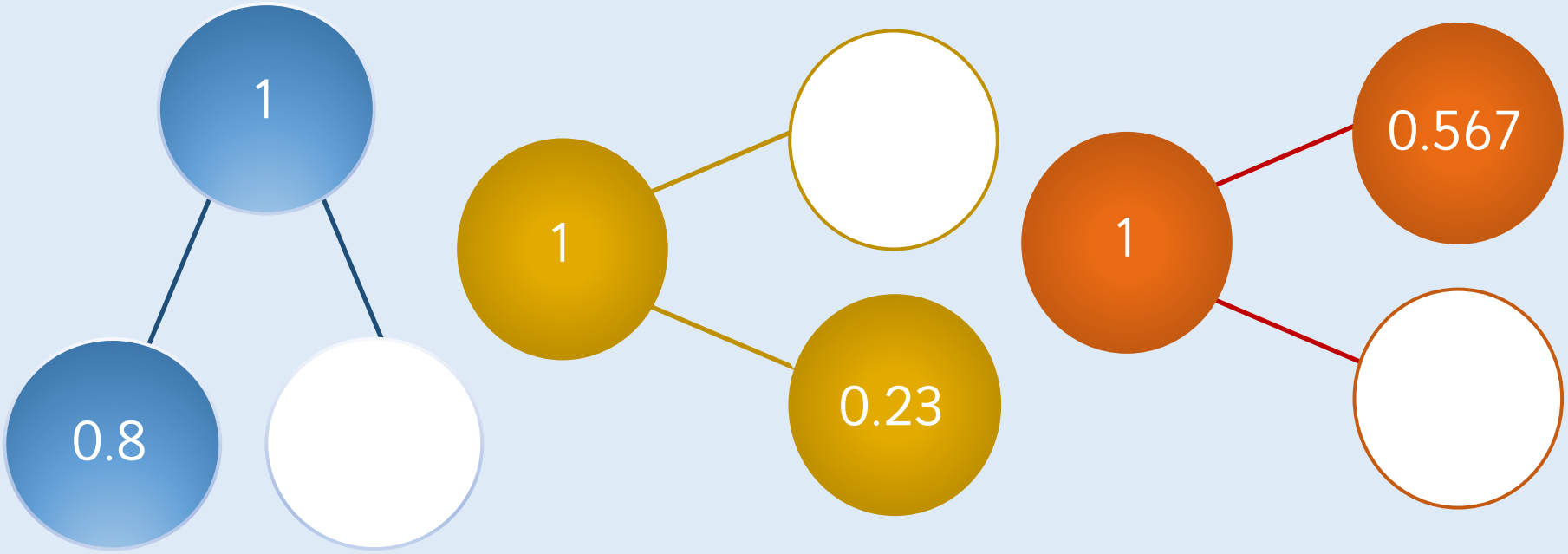






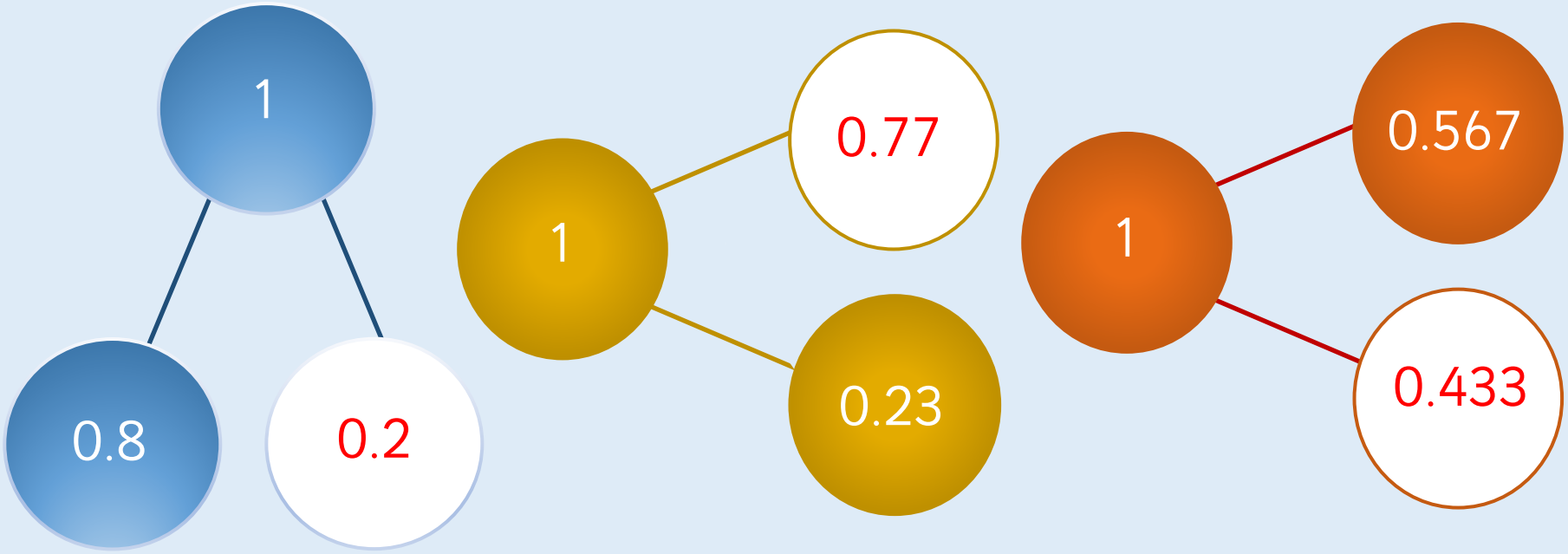
Activity 3 Complements to 1

Complete the part-whole models.



Activity 3 Complements to 1

Complete the part-whole models.



Activity 4 Complements to 1

Use the number line to find the complements to 1.

0.235 1

0.372 1

0.849 1

Activity 4 Complements to 1

Use the number line to find the complements to 1.

Reasoning 1 Complements to 1

$$0.33 + \square = 1$$

I think the answer is 0.777
because
0.3 + 0.7 = 1
0.03 + 0.07 = 0.1
0.003 + 0.007 = 0.01

Do you agree with Rosie?
Can you explain what her mistake was?

Reasoning 1 Complements to 1

$$0.33 + \boxed{0.67} = 1$$

I think the answer is 0.777 because

0.3 + 0.7 = 1

0.03 + 0.07 = 0.1

0.003 + 0.007 = 0.01

Do you agree with Rosie? Can you explain what her mistake was?

Rosie has forgotten that when you have 10 in a place value column, you need to use your rules of exchanging.

e.g.

10 tenths = 1 one

10 hundredths = 1 tenth

10 thousandths = 1 hundredth

The correct answer is 0.67.

Reasoning 2 Complements to 1

How many different ways can you find a path through the maze, adding each number at a time, to make a total of 1?

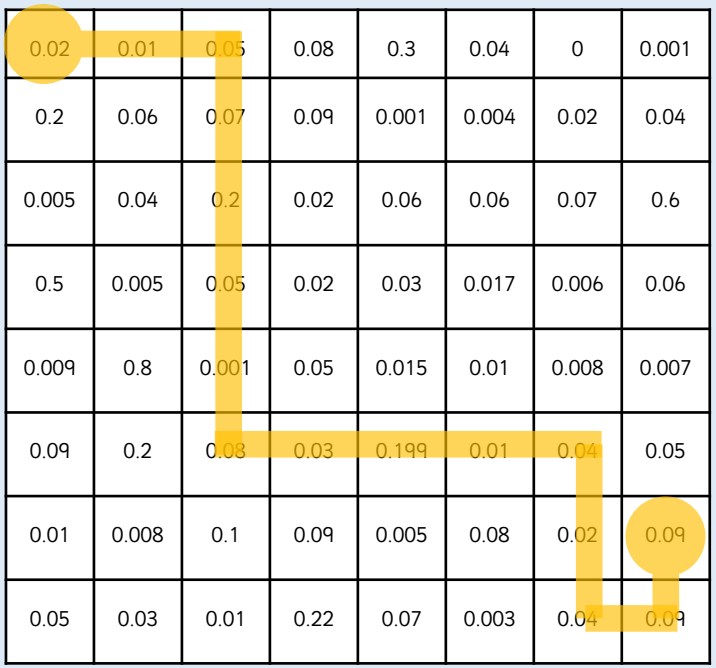
0.02	0.01	0.05	0.08	0.3	0.04	0	0.001
0.2	0.06	0.07	0.09	0.001	0.004	0.02	0.04
0.005	0.04	0.2	0.02	0.06	0.06	0.07	0.6
0.5	0.005	0.05	0.02	0.03	0.017	0.006	0.06
0.009	0.8	0.001	0.05	0.015	0.01	0.008	0.007
0.09	0.2	0.08	0.03	0.199	0.01	0.04	0.05
0.01	0.008	0.1	0.09	0.005	0.08	0.02	0.02
0.05	0.03	0.01	0.22	0.07	0.003	0.04	0..09

Once you have found a way, can you design your own smaller maze for others to solve?

Reasoning 2 Complements to 1

How many different ways can you find a path through the maze, adding each number at a time, to make a total of 1?

0.02	0.01	0.05	0.08	0.3	0.04	0	0.001
0.2	0.06	0.07	0.09	0.001	0.004	0.02	0.04
0.005	0.04	0.2	0.02	0.06	0.06	0.07	0.6
0.5	0.005	0.05	0.02	0.03	0.017	0.006	0.06
0.009	0.8	0.001	0.05	0.015	0.01	0.008	0.007
0.09	0.2	0.08	0.03	0.199	0.01	0.04	0.05
0.01	0.008	0.1	0.09	0.005	0.08	0.02	0.09
0.05	0.03	0.01	0.22	0.07	0.003	0.04	0.09



Once you have found a way, can you design your own smaller maze for others to solve?

Discuss

Complements to 1

What number bonds can you use to help you?

How can shading the hundred square help you find the complement to 1?

How many ways can you make 1? How many ways do you think there are?

If I add _____, which place will change? How many can I add to change the tenths/hundredths place?

Adding - Crossing the Whole

5

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Activity 1 Adding – Crossing the Whole

Use the place value grid to answer 0.435 + 0.652.

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

?

How would partitioning a number help us?

Activity 1 Adding – Crossing the Whole

$0.435 + 0.652 = 1.087$

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

1

0.01 0.01 0.01 0.01 0.001 0.001 0.001 0.001

0.01 0.01 0.01 0.01 0.001 0.001 0.001

Activity 2 Adding – Crossing the Whole

Use the place value grid to answer 0.531 + 0.782.

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

Activity 2 Adding – Crossing the Whole

$$0.531 + 0.782 = 1.313$$

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

Activity 3 Adding – Crossing the Whole

Leanna is using complements to 1 to add decimals.

0.55 + 0.72 =

This makes 1

0.45 0.27

0.55 + 0.45 + 0.27 = 1.27

Use Leanna's method to solve:

0.89 + 0.85 = ☐

0.56 + 0.78 = ☐

0.79 + 3.42 = ☐

?

How do you decide which number to partition?

Activity 3 Adding – Crossing the Whole

Leanna is using complements to 1 to add decimals.

Use Leanna's method to solve:

$0.89 + 0.85 = 1.74$

0.11 0.74

$0.89 + 0.11 + 0.74 = 1.74$

$0.56 + 0.78 = 1.34$

0.44 0.34

$0.56 + 0.44 + 0.34 = 1.34$

$0.79 + 3.42 = 4.21$

0.21 3.21

$0.79 + 0.21 + 3.21 = 4.21$

Activity 4 Adding – Crossing the Whole

Use the column method to solve the additions.

0.35 + 0.9 = ☐

0.522 + 0.9 = ☐

0.87 + 0.76 = ☐

0.543 + 0.5 = ☐

?

What complement to 1 would I use to answer this question?

Activity 4 Adding – Crossing the Whole

Use the column method to solve the additions.

0.35 + 0.9 = 1.25

$$\begin{array}{r} 0.35 \\ +\ 0.9 \\ \hline 1.25 \\ 1 \end{array}$$

0.87 + 0.76 = 1.63

$$\begin{array}{r} 0.87 \\ +\ 0.76 \\ \hline 1.63 \\ 1\ \ 1 \end{array}$$

0.522 + 0.9 = 1.422

$$\begin{array}{r} 0.522 \\ +\ 0.9 \\ \hline 1.422 \\ 1 \end{array}$$

0.543 + 0.5 = 1.043

$$\begin{array}{r} 0.543 \\ +\ 0.5 \\ \hline 1.043 \\ 1 \end{array}$$

Reasoning 1 Adding – Crossing the Whole

A place value grid is used to solve:

0.7 + 0.5

Zach thinks the answer is 0.12.

Ones	Tenths
	0.1 0.1 0.1 0.1 0.1 0.1 0.1
	0.1 0.1 0.1 0.1 0.1

Reasoning 1 Adding – Crossing the Whole

A place value grid is used to solve:

0.7 + 0.5

Zach thinks the answer is 0.12.

Ones	Tenths
	0.1 0.1 0.1 0.1 0.1 0.1 0.1
	0.1 0.1 0.1 0.1 0.1

Ten lots of 1 tenth is one whole. There are 12 tenths so Zach needs to make an exchange. He should exchange 0 tenths for 1 one.

The correct answer is **1.2**

Reasoning 2 Adding – Crossing the Whole

You will need a partner and a six-sided dice for this game.

0.□□□

Take it in turns rolling the dice twice and placing the digits in the blank spaces above. Record the number in a table.

Swap over with your partner.

Roll the dice again and add your new number to the first number. The winner is the person who, after adding four numbers, is the closest to 1.5 without going over.

Reasoning 2 Adding – Crossing the Whole

You will need a partner and a six-sided dice for this game.

0.□□

Take it in turns rolling the dice twice and placing the digits in the blank spaces above. Record the number in a table.

Swap over with your partner.

Roll the dice again and add your new number to the first number. The winner is the person who, after adding four numbers, is the closest to 1.5 without going over.

Player 1 rolls a 1 and a 4. 0.14

Player 1 then rolls a 2 and a 6. 0.26

0.14 + 0.26 = 0.38

Player	Player 2
0.14	0.64
0.38	1.23
0.69	1.49
1.24	1.60

Discuss

Adding – Crossing the Whole

What happens when we have 10 in a place value column?

How would partitioning a number help us?
How do you decide which number to partition?

Why is partitioning 0.67 into 0.55 and 0.12 more helpful than 0.6 and 0.07?

What complement to 1 would I use to answer this question?

Adding Same Decimal Places

5

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Activity 1 Adding Same Decimal Places

Use the place value chart to add 4.51 and 5.48.

Ones	Tenths	Hundredths
1 1 1 1	0.1 0.1 0.1 0.1 0.1	0.01
1 1 1 1 1	0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01

$$\begin{array}{r} 4.51 \\ +\ 5.48 \\ \hline \end{array}$$

?

Why is it important to line up the columns?

Activity 1 Adding Same Decimal Places

Use the place value chart to add 4.51 and 5.48.

Ones	Tenths	Hundredths
1 1 1 1	0.1 0.1 0.1 0.1 0.1	0.01
1 1 1 1 1	0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01

$$\begin{array}{r} 4.51 \\ +\ 5.48 \\ \hline 9.99 \end{array}$$

Activity 2 Adding Same Decimal Places

Use the place value chart to add 3.43 and 1.44.

Ones	Tenths	Hundredths
1 1 1	0.1 0.1 0.1 0.1	0.01 0.01 0.01
1	0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01

$$\begin{array}{r} 3.43 \\ +\ 1.44 \\ \hline \end{array}$$

Activity 2 Adding Same Decimal Places

Use the place value chart to add 3.43 and 1.44.

Ones	Tenths	Hundredths
1 1 1	0.1 0.1 0.1 0.1	0.01 0.01 0.01
1	0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01

$$\begin{array}{r} 3.43 \\ +\ 1.44 \\ \hline 4.87 \end{array}$$

Activity 3 Adding Same Decimal Places

Use the column method to solve these additions.

$$\begin{array}{r} 2.25 \\ +\ 5.63 \\ \hline \end{array}$$

$$\begin{array}{r} 1.92 \\ +\ 1.52 \\ \hline \end{array}$$

$$\begin{array}{r} 6.03 \\ +\ 2.04 \\ \hline \end{array}$$

$$\begin{array}{r} 6.07 \\ +\ 6.28 \\ \hline \end{array}$$

?

Why is the position of the decimal point important?

Activity 3 Adding Same Decimal Places

Use the column method to solve these additions.

$$\begin{array}{r} 2.25 \\ +\ 5.63 \\ \hline 7.88 \end{array}$$

$$\begin{array}{r} 1.92 \\ +\ 1.52 \\ \hline 3.44 \end{array}$$

$$\begin{array}{r} 6.03 \\ +\ 2.04 \\ \hline 8.07 \end{array}$$

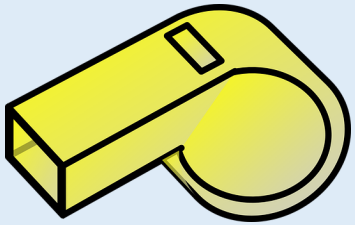
$$\begin{array}{r} 6.07 \\ +\ 6.28 \\ \hline 12.35 \end{array}$$

Activity 3

Adding Same Decimal Places

Zach goes to the shop. He buys three items. What is the most he could pay? What is the least he could pay?

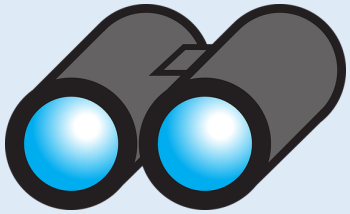
Zach



£1.56

£2.89

£4.08



£3.90

Activity 3

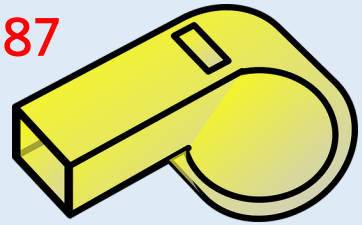
Adding Same Decimal Places

Zach goes to the shop. He buys three items. What is the most he could pay? What is the least he could pay?

The least he could pay = £8.35

The most he could pay = £10.87

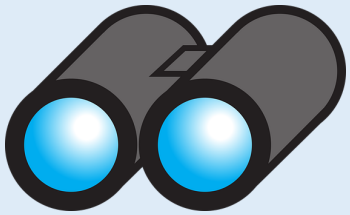
Zach



£1.56

£2.89

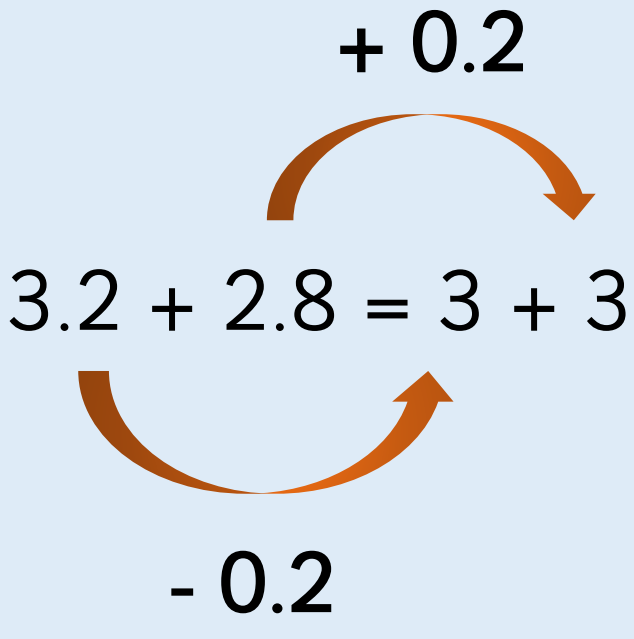
£4.08

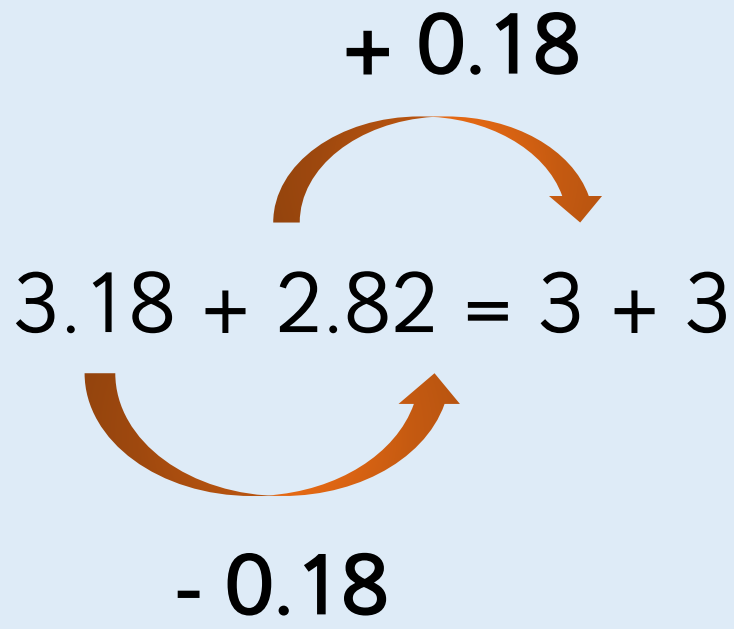


£3.90

Reasoning 1 Adding Same Decimal Places

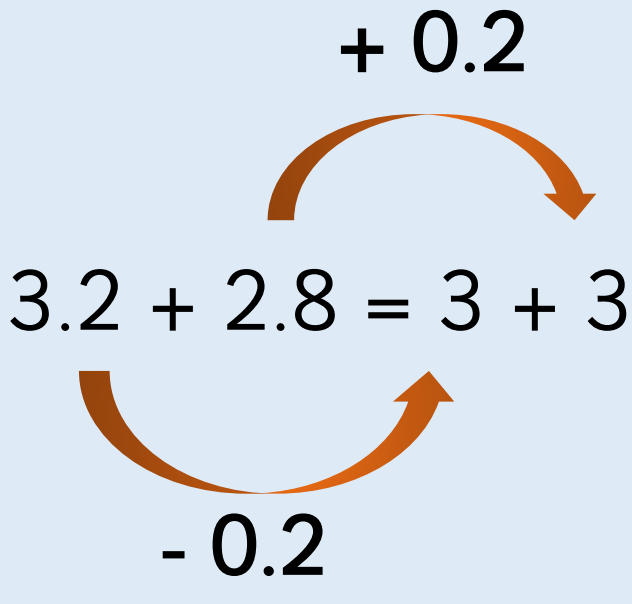
Using these strategies, can you find more number sentences which have the same total as 3 + 3?

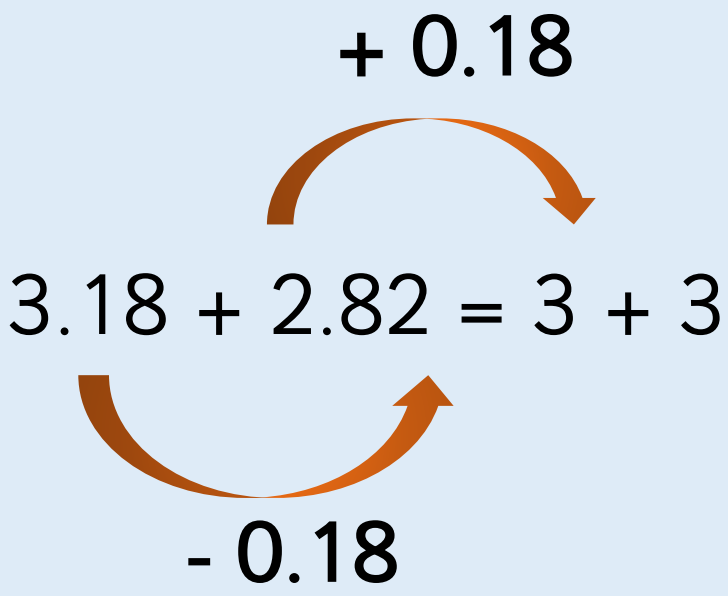




Reasoning 1 Adding Same Decimal Places

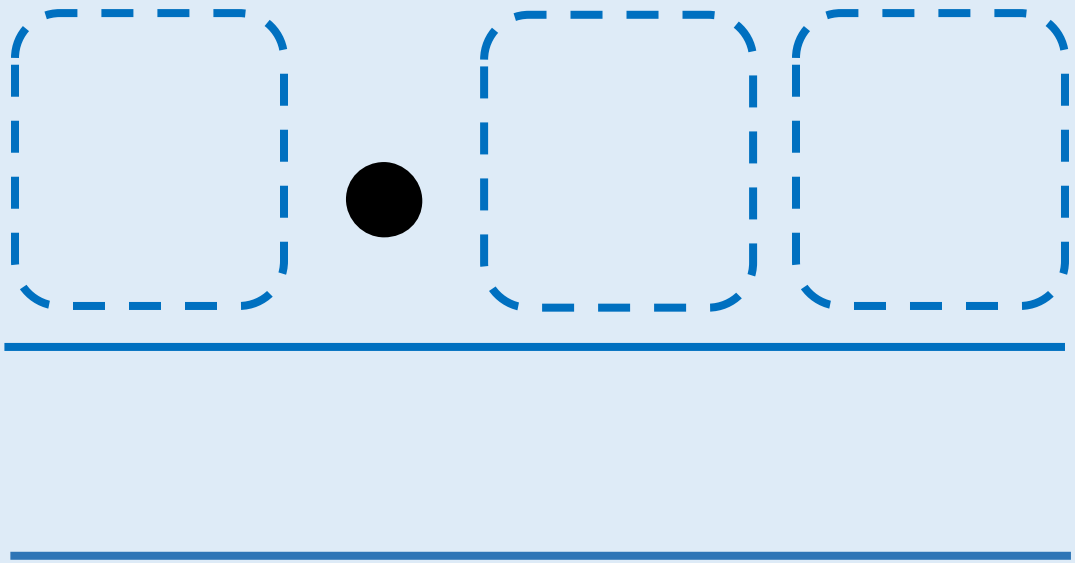
Using these strategies, can you find more number sentences which have the same total as 3 + 3?





Children may find a range of answers. The important teaching point is to highlight that you have added the same to one number as you have taken away from the other.

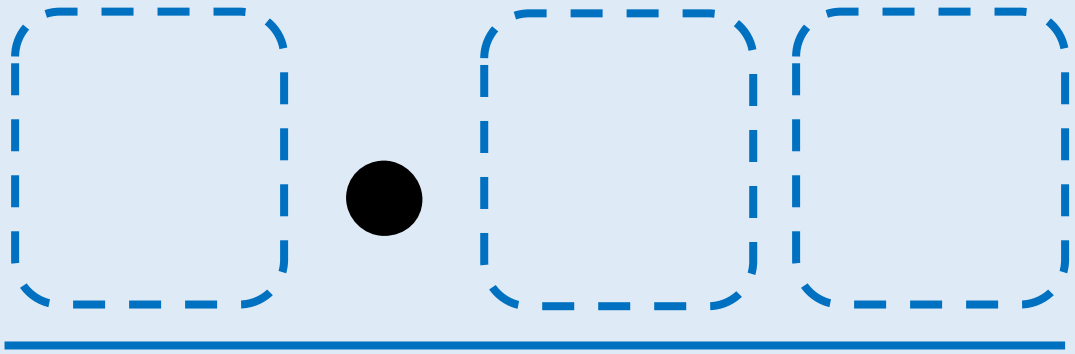
Reasoning 2 Adding Same Decimal Places



Using the digits 0 – 9 only once in each of the spaces above, what is:

- The largest sum possible
- The smallest sum possible
- Is there more than one way of creating each total?

Reasoning 2 Adding Same Decimal Places



Using the digits 0 – 9 only once in each of the spaces above, what is:

- The largest sum possible
- The smallest sum possible
- Is there more than one way of creating each total?

Largest

9.75 + 8.64

9.65 + 8.74

9.64 + 8.75

9.74 + 8.65

Smallest

0.24 + 1.35

0.25 + 1.34

0.34 + 1.25

0.35 + 1.24

Discuss

Adding Same Decimal Places

Why is it important to line up the columns?

What happens when there are a total of ten counters in a place value column?

Why is the position of the decimal point important?

Subtract Same Decimal Places

5

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Activity 1 Subtract Same Decimal Places

Use the place value chart to find the answer to 4.57 – 1.23.

Ones	Tenths	Hundredths
1 1 1 1	0.1 0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01 0.01 0.01 0.01
1	0.1 0.1	0.01 0.01 0.01

$$\begin{array}{r} 4.57 \\ -\ 1.23 \\ \hline \end{array}$$

Activity 1 Subtract Same Decimal Places

Use the place value chart to find the answer to 4.57 – 1.23.

Ones	Tenths	Hundredths
1 1 1 1	0.1 0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01 0.01 0.01 0.01
1	0.1 0.1	0.01 0.01 0.01

$$\begin{array}{r} 4.57 \\ -\ 1.23 \\ \hline 3.34 \end{array}$$

Activity 2 Subtract Same Decimal Places

Use the place value chart to find the answer to 3.33 – 2.14.

Ones	Tenths	Hundredths
1 1 1	0.1 0.1 0.1	0.01 0.01 0.01
1 1	0.1	0.01 0.01 0.01 0.01

$$\begin{array}{r} 3.33 \\ -\ 2.14 \\ \hline \end{array}$$

?

What happens when you need to subtract a greater digit from a smaller digit?

Activity 2 Subtract Same Decimal Places

Use the place value chart to find the answer to 3.33 – 2.14.

Ones	Tenths	Hundredths
1 1 1	0.1 0.1 0.1	0.01 0.01 0.01
1 1	0.1	0.01 0.01 0.01 0.01

$$\begin{array}{r} 3.33 \\ -\ 2.14 \\ \hline 1.19 \end{array}$$

Activity 3

Subtract Same Decimal Places

Use the column method to answer these questions.

$$\begin{array}{r} 6.78 \\ -\ 5.04 \\ \hline \end{array}$$

$$\begin{array}{r} 5.07 \\ -\ 4.34 \\ \hline \end{array}$$

$$\begin{array}{r} 2.58 \\ -\ 1.21 \\ \hline \end{array}$$

$$\begin{array}{r} 6.07 \\ -\ 2.28 \\ \hline \end{array}$$

?

Do we only ever make one exchange in a subtraction calculation?

Activity 3 Subtract Same Decimal Places

Use the column method to answer these questions.

$$\begin{array}{r} 6.78 \\ -\ 5.04 \\ \hline 1.74 \end{array}$$

$$\begin{array}{r} 2.58 \\ -\ 1.21 \\ \hline 1.37 \end{array}$$

$$\begin{array}{r} {}^{4}\cancel{5}\,.\,{}^{1}0\,7 \\ -\ 4.34 \\ \hline 0.73 \end{array}$$

$$\begin{array}{r} {}^{5}\cancel{6}\,.\,{}^{1}0\,7 \\ -\ 2.28 \\ \hline 3.79 \end{array}$$

Activity 4 Subtract Same Decimal Places

How much money does he have left?

Zach

Zach has £12.54 in his wallet.
He buys a football which costs £5.82.

Activity 4 Subtract Same Decimal Places

How much money does he have left?

Zach

Zach has £12.54 in his wallet.
He buys a football which costs £5.82.

£6.72

Reasoning 1

Subtract Same Decimal Places

Malachi and Leanna
have some money.

Malachi has £3.45 more than Leanna.

They have £12.45 altogether.
How much money does
Leanna have?

Reasoning 1

Subtract Same Decimal Places

Malachi and Leanna have some money.

Malachi has £3.45 more than Leanna.

They have £12.45 altogether.
How much money does Leanna have?

Leanna has £4.50.

Reasoning 2 Subtract Same Decimal Places

How much money does she have left?

Esin has £13.62 in her purse.
She buys a rugby ball which cost £4.70.

Reasoning 2

Subtract Same Decimal Places

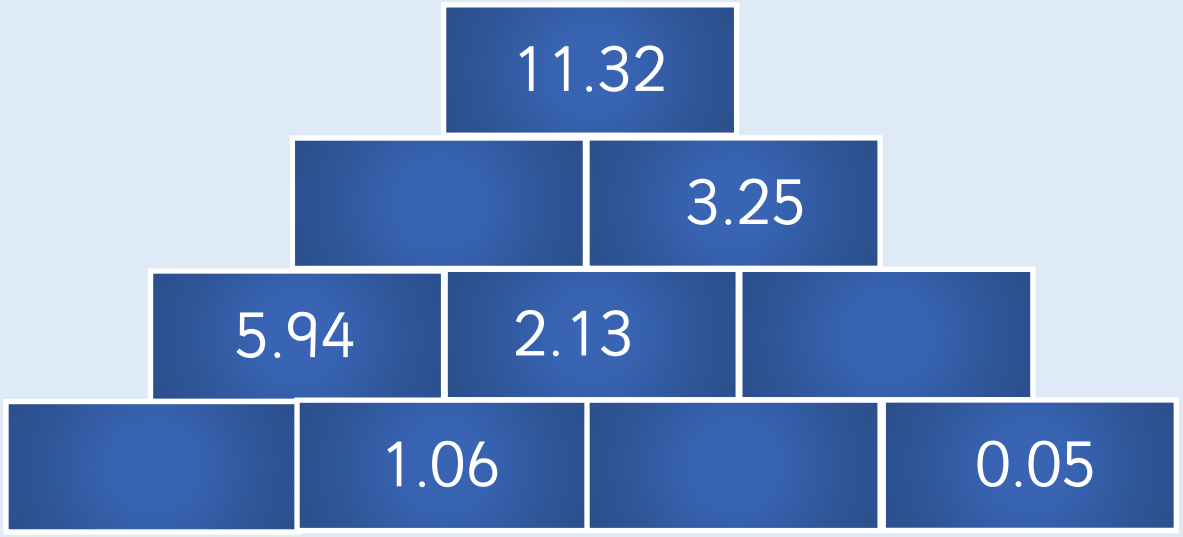
How much money does she have left?

Esin has £13.62 in her purse.
She buys a rugby ball which cost £4.70.

£ 8.92

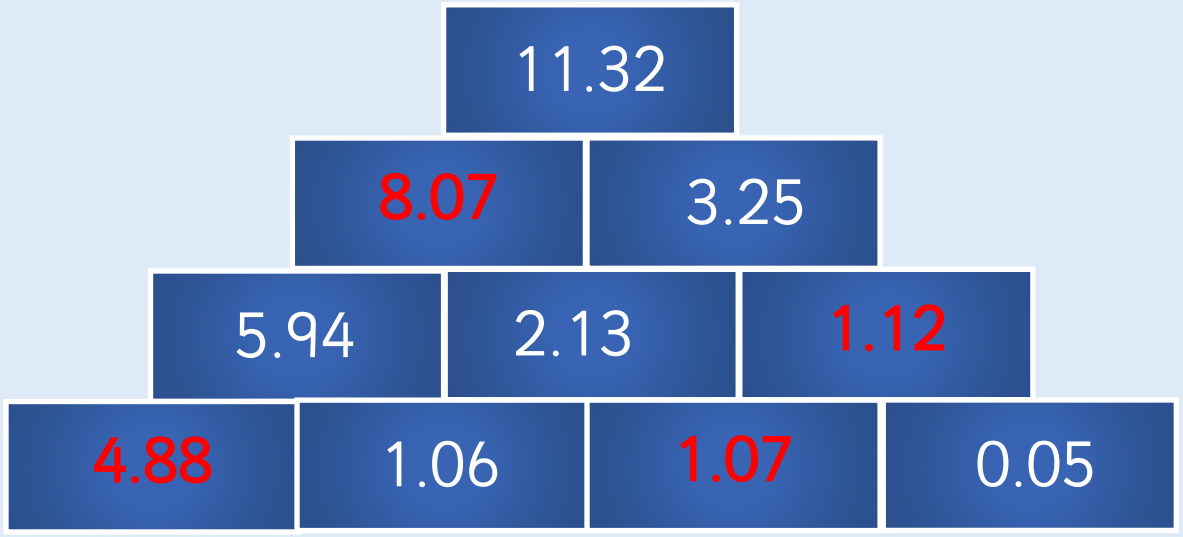
Reasoning 3 Subtract Same Decimal Places

In this number pyramid, each number is calculated by adding the two numbers underneath.



Reasoning 3 Subtract Same Decimal Places

In this number pyramid, each number is calculated by adding the two numbers underneath.



Discuss

Subtract Same Decimal Places

What happens when you need to subtract a greater digit from a smaller digit, e.g. 3 hundredths minus 4 hundredths?

How many tenths are equivalent to 1 hundredth?

Do we only ever make one exchange in a subtraction calculation?

Which of these numbers will need exchanging?

Can you predict what the answer might be?

How could you check your answer?

Adding Different Decimal Places

5

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Activity 1 Adding Different Decimal Places

Use the place value grid to add 4.5 and 4.46.

Ones	Tenths	Hundredths
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	0.01 0.01 0.01 0.01 0.01 0.01

$$\begin{array}{r} 4.5 \\ +\ 4.46 \\ \hline \end{array}$$

?

What would a sensible estimate be?

Activity 1 Adding Different Decimal Places

Use the place value grid to add 4.5 and 4.46.

Ones	Tenths	Hundredths
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	0.01 0.01 0.01 0.01 0.01 0.01

$$\begin{array}{r} 4.5 \\ +\ 4.46 \\ \hline 8.96 \end{array}$$

Activity 2 Adding Different Decimal Places

Use the place value grid to add 1.3 and 3.52.

Ones	Tenths	Hundredths
1	0.1 0.1 0.1	
1 1 1	0.1 0.1 0.1 0.1 0.1	0.01 0.01

$$\begin{array}{r} 1 . 3 \\ + \quad 3 . 5 2 \\ \hline \end{array}$$

Activity 2 Adding Different Decimal Places

Use the place value grid to add 1.3 and 3.52.

Ones	Tenths	Hundredths
1	0.1 0.1 0.1	
1 1 1	0.1 0.1 0.1 0.1 0.1	0.01 0.01

$$\begin{array}{r} 1 . 3 \\ + \quad 3 . 5 2 \\ \hline 4 . 8 2 \end{array}$$

Activity 3 Adding Different Decimal Places

Use the column method to answer these questions.

$$\begin{array}{r} 2.2 \\ +\ 5.63 \\ \hline \end{array}$$

$$\begin{array}{r} 6.03 \\ +\ 2.3 \\ \hline \end{array}$$

$$\begin{array}{r} 1.9 \\ +\ 1.526 \\ \hline \end{array}$$

$$\begin{array}{r} 6.075 \\ +\ 2.28 \\ \hline \end{array}$$

?

What would a sensible estimate be?

Activity 3 Adding Different Decimal Places

Use the column method to answer these questions.

$$\begin{array}{r} 2.2 \\ +\ 5.63 \\ \hline 7.83 \end{array}$$

$$\begin{array}{r} 6.03 \\ +\ 2.3 \\ \hline 8.33 \end{array}$$

$$\begin{array}{r} 1.9 \\ +\ 1.526 \\ \hline 3.426 \\ 1 \end{array}$$

$$\begin{array}{r} 6.075 \\ +\ 2.28 \\ \hline 8.355 \\ 1 \end{array}$$

Activity 4 Adding Different Decimal Places

Billy is cycling in a race.
He has cycled 4.232 km and now has 2.5 km left.

What is the total distance of the race?

Activity 4 Adding Different Decimal Places

Billy is cycling in a race.
He has cycled 4.232 km and now has 2.5 km left.

What is the total distance of the race?

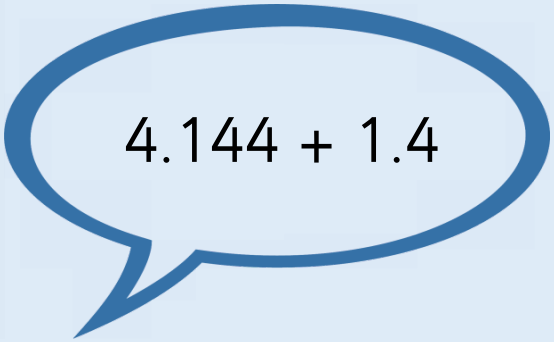
Total distance of the race is 6.732.

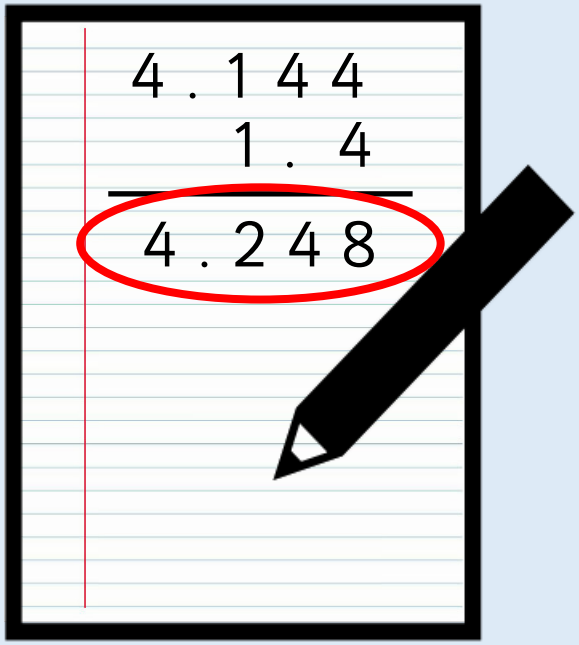
Reasoning 1 Adding Different Decimal Places

Work out the correct answer.

Leanna is trying to find the answer to

Leanna





Can you spot and explain her error?

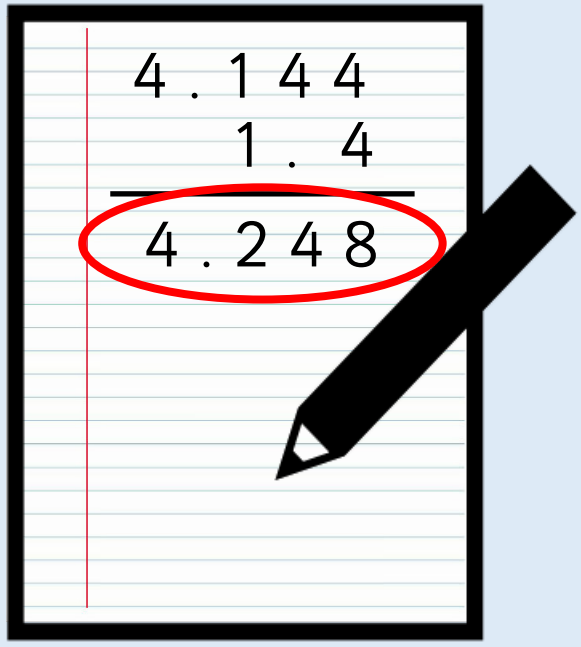
Reasoning 1 Adding Different Decimal Places

Work out the correct answer.

Leanna is trying to find the answer to

Leanna

4.144 + 1.4



Can you spot and explain her error?

The digits are lined up incorrectly.
Leanna needs to line up the decimal point.
The correct answer is **5.544**

Reasoning 2 Adding Different Decimal Places

Place the calculations in the correct column in the table.

9.99 + 0.1

9.99 + 1

9.99 + 0.001

9.99 + 0.01

Some calculations might need to go in more than one place.

No Exchange	Exchange in the ones column	Exchange in the tenths column	Exchange in the hundredths column	Exchange in the thousandths column

Reasoning 2 Adding Different Decimal Places

Place the calculations in the correct column in the table.

9.99 + 0.1

9.99 + 1

9.99 + 0.001

9.99 + 0.01

Some calculations might need to go in more than one place.

No Exchange	Exchange in the ones column	Exchange in the tenths column	Exchange in the hundredths column	Exchange in the thousandths column
9.99 + 0.001	9.99 + 1 9.99 + 0.1 9.99 + 0.01	9.99 + 0.1 9.99 + 0.01	9.99 + 0.01	

Discuss

Adding Different Decimal Places

Why is the decimal point important when we are reading and writing a number?

What would a sensible estimate be?

Is this a sensible answer? Why/why not?

What advice would you give to someone struggling with recording their numbers in the correct place?

Subtracting Different Decimal Places

5

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Activity 1 Subtracting Different Decimal Places

Use the place value grid to help subtract 1.4 from 4.54.

Ones	Tenths	Hundredths
1 1 1 1	0.1 0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01
1	0.1 0.1 0.1 0.1	

$$\begin{array}{r} 4.54 \\ -\ 1.4 \\ \hline \end{array}$$

?

Are there more efficient methods for this question?

Activity 1 Subtracting Different Decimal Places

Use the place value grid to help subtract 1.4 from 4.54.

Ones	Tenths	Hundredths
1 1 1 1	0.1 0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01
1	0.1 0.1 0.1 0.1	

$$\begin{array}{r} 4.54 \\ -\ 1.4 \\ \hline 3.14 \end{array}$$

Activity 2 Subtracting Different Decimal Places

Use the place value grid to help subtract 2.3 from 4.55.

Ones	Tenths	Hundredths
1 1 1 1	0.1 0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01 0.01
1 1	0.1 0.1 0.1	

$$\begin{array}{r} 4.55 \\ -\ 2.3 \\ \hline \end{array}$$

Activity 2 Subtracting Different Decimal Places

Use the place value grid to help subtract 2.3 from 4.55.

Ones	Tenths	Hundredths
1 1 1 1	0.1 0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01 0.01
1 1	0.1 0.1 0.1	

$$\begin{array}{r} 4.55 \\ -\ 2.3 \\ \hline 2.25 \end{array}$$

Activity 3 Subtracting Different Decimal Places

Use the column method to answer these questions.

$$\begin{array}{r} 6.06 \\ -\ 3.7 \\ \hline \end{array}$$

$$\begin{array}{r} 6.78 \\ -\ 5.046 \\ \hline \end{array}$$

$$\begin{array}{r} 4.7 \\ -\ 3.825 \\ \hline \end{array}$$

$$\begin{array}{r} 2.5 \\ -\ 1.214 \\ \hline \end{array}$$

What does it mean if there is nothing in a place value column?
How can we represent this in the formal written method?

Activity 3 Subtracting Different Decimal Places

Use the column method to answer these questions.

$$\begin{array}{r} {}^{5}\cancel{6}\,.\,{}^{1}0\;6 \\ -\;\;3\;.\;7 \\ \hline 2\;.\;3\;6 \end{array}$$

$$\begin{array}{r} 6\;.\;7\;{}^{7}\cancel{8}\;{}^{1}0 \\ -\;\;5\;.\;0\;4\;6 \\ \hline 1\;.\;7\;3\;4 \end{array}$$

$$\begin{array}{r} {}^{3}\cancel{4}\,.\,{}^{16}\cancel{1}\,{}^{9}\cancel{0}\;{}^{1}0 \\ -\;\;3\;.\;8\;2\;5 \\ \hline 0\;.\;8\;7\;5 \end{array}$$

$$\begin{array}{r} 2\;.\;{}^{4}\cancel{5}\;{}^{9}\cancel{0}\;{}^{1}0 \\ -\;\;1\;.\;2\;1\;4 \\ \hline 1\;.\;2\;8\;6 \end{array}$$

Activity 4

Subtracting Different Decimal Places

How much change would I get from £10 if I bought a basket of strawberries costing £4.27?

Activity 4

Subtracting Different Decimal Places

How much change would I get from £10 if I bought a basket of strawberries costing £4.27?

Change is £5.73.

Reasoning 1

Subtracting Different Decimal Places

Leanna

If there are 5 hundredths and I subtract it from nothing, then there are still 5 hundredths.

$$\begin{array}{r} 4.9 \\ -\ 3.85 \\ \hline 1.15 \end{array}$$

Do you agree with Leanna?
Explain your answer.

Reasoning 1 Subtracting Different Decimal Places

Leanna

If there are 5 hundredths and I subtract it from nothing, then there are still 5 hundredths.

$$\begin{array}{r} 4.9 \\ -\ 3.85 \\ \hline 1.15 \end{array}$$

Do you agree with Leanna?
Explain your answer.

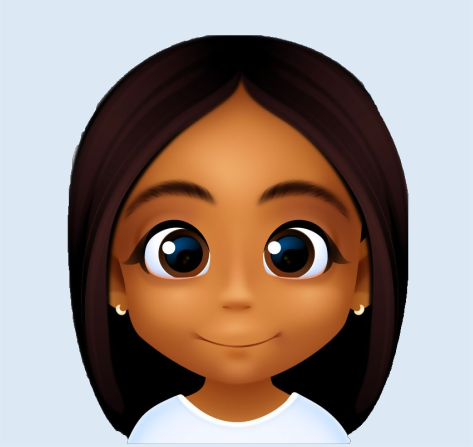
Leanna is not correct. She needs to use zero as a place value holder in the hundredths column of 4.9 and then exchange.

Encourage children to explore more efficient mental strategies as well as correcting the formal method.

The correct answer is 1.05.

Reasoning 2

Subtracting Different Decimal Places



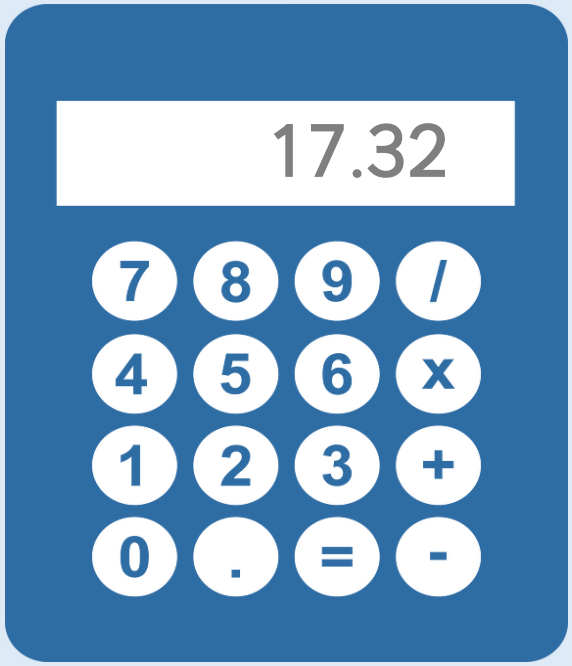
Rosie used a calculator to solve:

31.4 – 1.408

When she looked at her answer of 17.32, she realised she'd made a mistake.

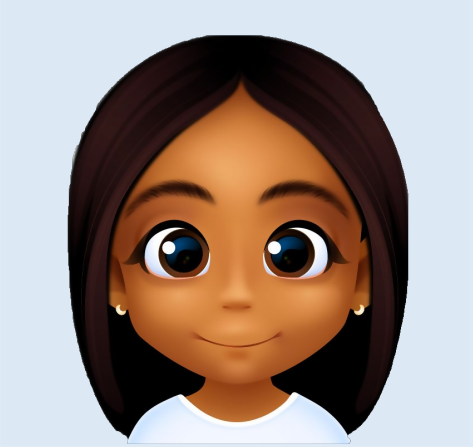
She had typed in all the correct digits.

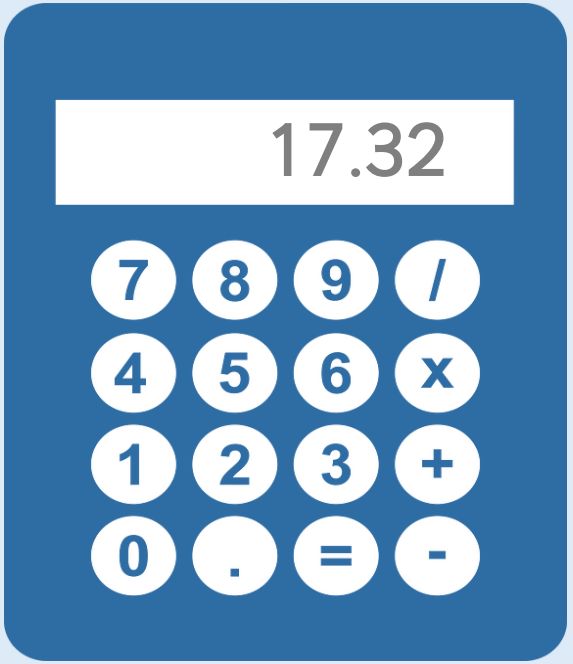
Can you spot her mistake?
What should the correct answer be?



Reasoning 2

Subtracting Different Decimal Places





Rosie used a calculator to solve:

31.4 – 1.408

When she looked at her answer of 17.32, she realised she'd made a mistake.

She had typed in all the correct digits.

Can you spot her mistake?
What should the correct answer be?

Rosie placed the decimal point after 4 making 14.08 instead of 1.408. The correct answer is 29.992.

Discuss

Subtracting Different Decimal Places

What does it mean if there is nothing in a place value column?

How can we represent this in the formal written method?

What do you notice about 4.7 – 3.825 and 4.699 – 3.824?
Is one of them more difficult than the other? Why?

Are there more efficient methods for this question?

Wholes and Decimals

5

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Activity 1 Wholes and Decimals

Use the place value grid to help subtract 143 and 1.45.

Hundreds	Tens	Ones	Tenths	Hundredths
100	10 10 10 10	1 1 1		
		1	0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01 0.01

$$\begin{array}{r} 1\ 4\ 3 \\ -\quad 1\ .\ 4\ 5 \\ \hline \end{array}$$

Activity 1 Wholes and Decimals

Use the place value grid to help subtract 143 and 1.45.

Hundreds	Tens	Ones	Tenths	Hundredths
100	10 10 10 10	1 1 1		
		1	0.1 0.1 0.1 0.1	0.01 0.01 0.01 0.01 0.01

$$\begin{array}{r} 1\ 4\ \overset{2}{\cancel{3}}\ .\ \overset{9}{\overset{1}{\cancel{0}}}\ \overset{1}{0} \\ -\quad 1\ .\ 4\ 5 \\ \hline 1\ 4\ 1\ .\ 5\ 5 \end{array}$$

? *Which is the most efficient method for this calculation? Explain why.*

Activity 2 Wholes and Decimals

Use the place value grid to help add 241 and 1.22.

Hundreds	Tens	Ones	Tenths	Hundredths
100 100	10 10 10 10	1		
		1	0.1 0.1	0.01 0.01

$$\begin{array}{r} 2\ 4\ 1 \\ +\quad 1\ .\ 2\ 2 \\ \hline \end{array}$$

Activity 2 Wholes and Decimals

Use the place value grid to help add 241 and 1.22.

Hundreds	Tens	Ones	Tenths	Hundredths
100 100	10 10 10 10	1		
		1	0.1 0.1	0.01 0.01

$$\begin{array}{r} 241 \\ +\ \ 1.22 \\ \hline 242.22 \end{array}$$

Activity 2 Wholes and Decimals

Use the place value grid to help work out the values below.

Hundreds	Tens	Ones	Tenths	Hundredths
	10 10	1 1 1		

$$\begin{array}{r} 2\ 3 \\ -\quad 1\ .\ 5 \\ \hline \end{array}$$

Hundreds	Tens	Ones	Tenths	Hundredths
	10	1 1		

$$\begin{array}{r} 1\ 2 \\ -\quad 1\ .\ 2 \\ \hline \end{array}$$

Activity 2 Wholes and Decimals

Use the place value grid to help work out the values below.

Hundreds	Tens	Ones	Tenths	Hundredths
	10 10	1 1 1		

$$\begin{array}{r} 2\,\overset{2}{\cancel{3}}\,.\,{}^{1}0 \\ -\quad 1\,.\,5 \\ \hline 2\,1\,.\,5 \end{array}$$

Hundreds	Tens	Ones	Tenths	Hundredths
	10	1 1		

$$\begin{array}{r} 1\,\overset{1}{\cancel{2}}\,.\,{}^{1}0 \\ -\quad 1\,.\,2 \\ \hline 1\,0\,.\,8 \end{array}$$

Activity 3 Wholes and Decimals

Find the most efficient method to solve this calculations.

43 – 2.14 + 0.86 =	19 – 0.25 =
23 + 4.105 =	19 – 17.37 =

Can you use different methods? (Number line, column subtraction, mentally).

Activity 3 Wholes and Decimals

Find the most efficient method to solve this calculations.

43 – 2.14 + 0.86	=	41.72	19 – 0.25	=	18.75
23 + 4.105	=	27.105	19 – 17.37	=	1.63

What are the missing digits in the calculation?

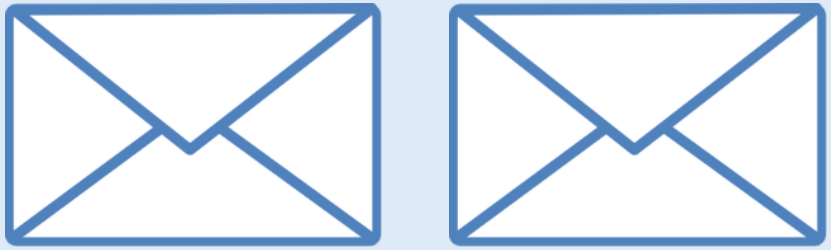
$$\begin{array}{r} 31.?0 \\ -\ ?.37 \\ \hline 29.63 \end{array}$$

Wholes and Decimals

What are the missing digits in the calculation?

$$\begin{array}{r} 31.00 \\ -\ 1.37 \\ \hline 29.63 \end{array}$$

What are the missing digits in the calculation?



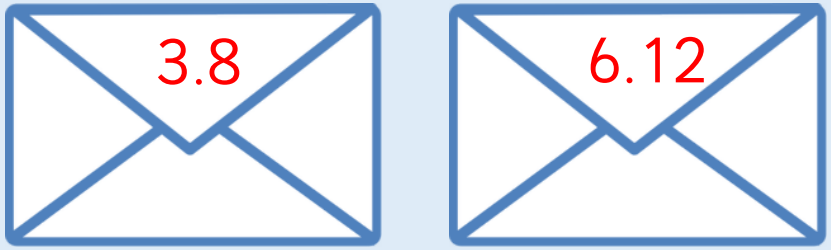
Two envelopes contain two different numbers.

- The sum of the numbers is 9.92
- The difference between the numbers is 2.32

What numbers are inside the envelopes?

How can this bar model help?

What are the missing digits in the calculation?



Two envelopes contain two different numbers.

- The sum of the numbers is 9.92
- The difference between the numbers is 2.32

What numbers are inside the envelopes?

How can this bar model help?

Discuss

Wholes and Decimals

What is a whole number/integer?

Where can we add a decimal point to the number 143 so that its value stays the same?

What's the same and what's different about 10 and 10.0?

Can you use different methods? (Number line, column subtraction, mentally).

Which method is most efficient for this calculation? Explain why

Decimal Sequences

5

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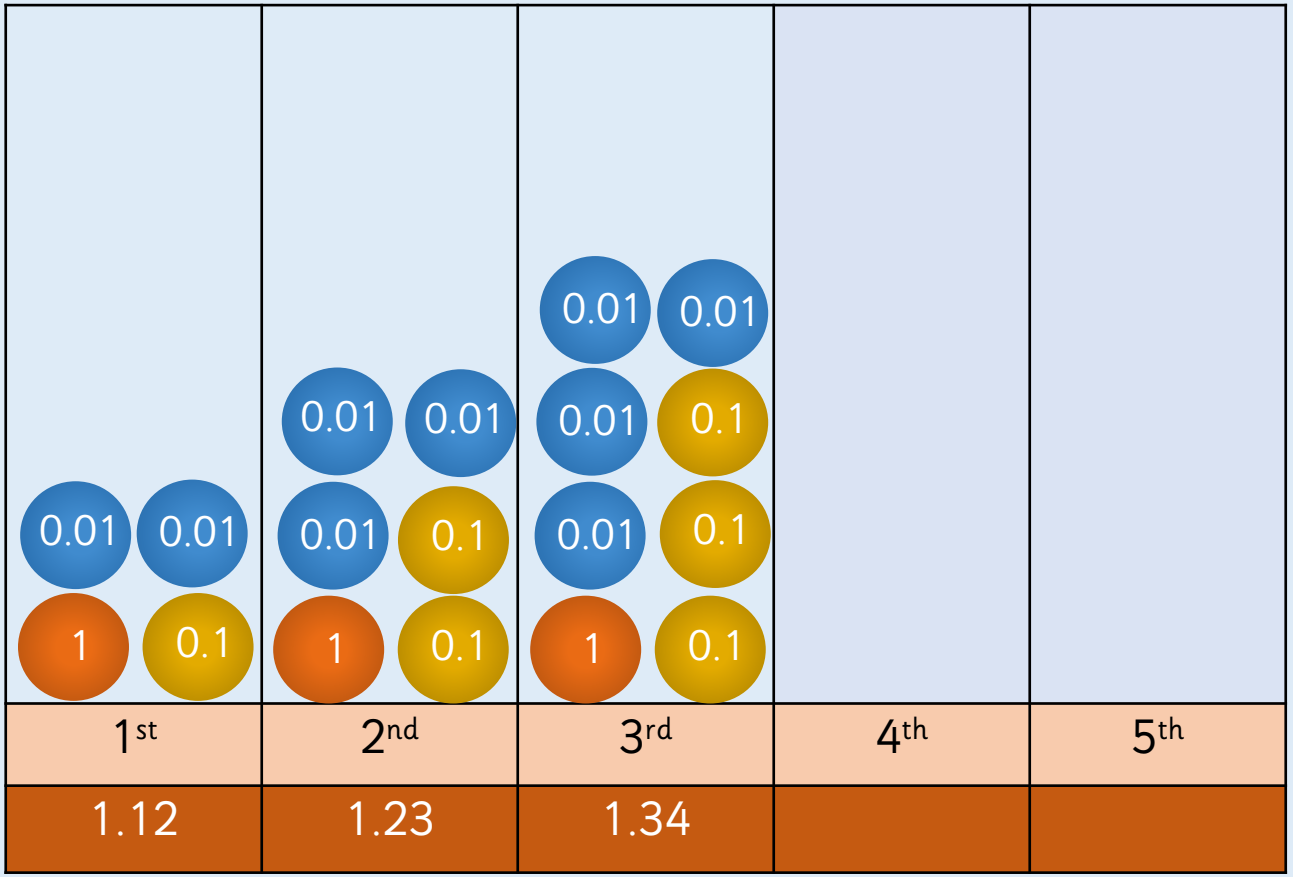
Activity 1 Decimal Sequences

Complete the sequence.

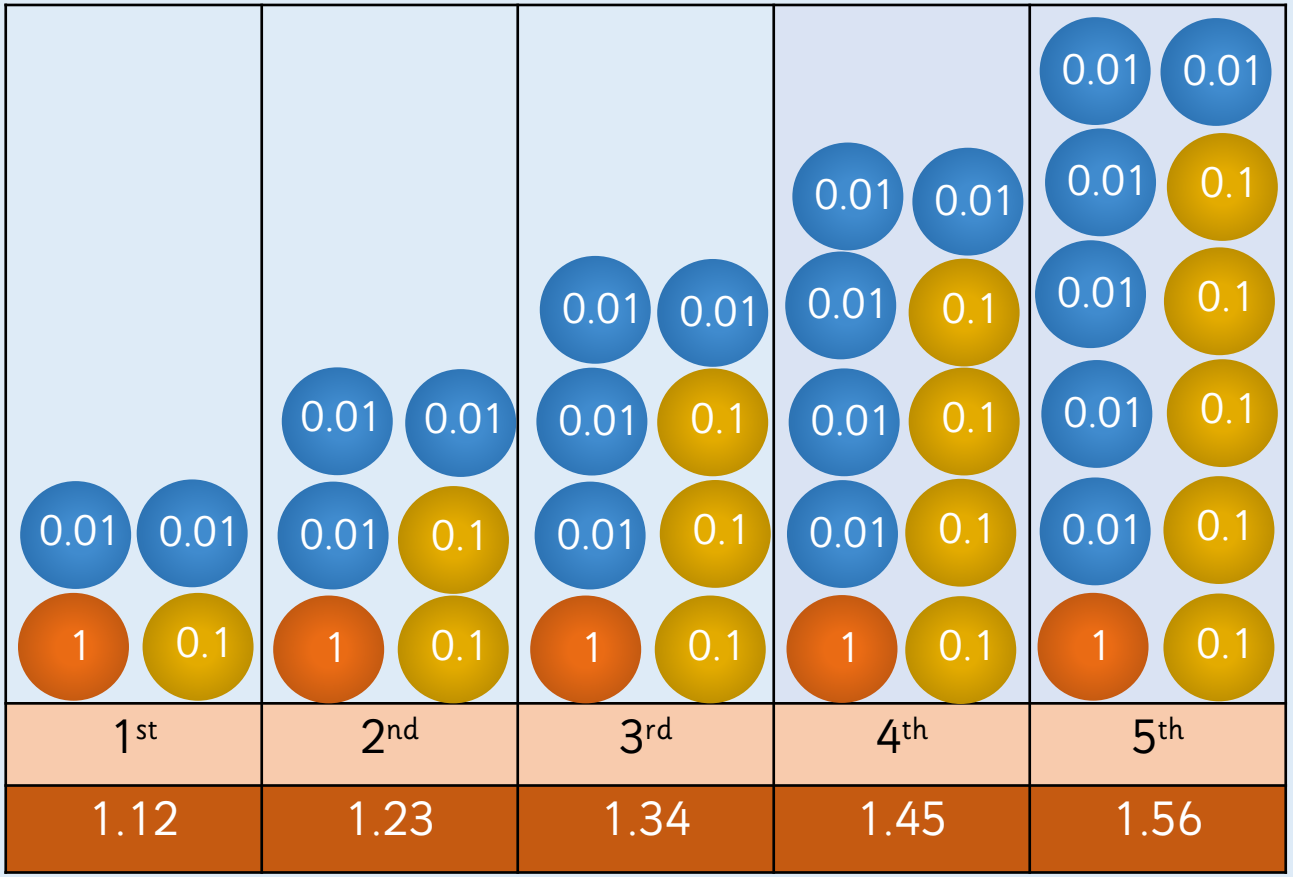


?

What do the terms 'increasing' and 'decreasing' mean?

Activity 1 Decimal Sequences

Complete the sequence.



Activity 2 Decimal Sequences

Write the rules for each sequence.

0.45, 0.6, 0.75, 0.9

The rule is ☐.

1.25, 2.5, 3.75, 5, 6.25

The rule is ☐.

?

Is the sequence increasing by the same amount each time? By how much?

Activity 2 Decimal Sequences

Write the rules for each sequence.

0.45, 0.6, 0.75, 0.9

The rule is 0.15 .

1.25, 2.5, 3.75, 5, 6.25

The rule is 1.25 .

Activity 3 Decimal Sequences

Generate the first five terms of this sequence.

The 1st term is 1.45.
The sequence decreases by 0.12 each time.

1.45				

The 1st term is 0.13.
The sequence increases by 0.50 each time.

0.13				

?

Is the sequence increasing by the same amount each time? By how much?

Activity 3 Decimal Sequences

Generate the first five terms of this sequence.

The 1st term is 1.45
The sequence decreases by 0.12 each time.

1.45, 1.33, 1.21, 1.09, 0.97

The 1st term is 0.13
The sequence increases by 0.50 each time.

0.13, 0.63, 1.13, 1.63, 2.13

Reasoning 1 Decimal Sequences

9.48 9.52 9.56 9.6 ...

Zach

The number 9.7 will be in this sequence.

Do you agree with Zach?
Explain your answer.

Reasoning 1 Decimal Sequences

9.48 9.52 9.56 9.6 ___

The number 9.7 will be in this sequence.

Do you agree with Zach? Explain your answer.

Zach is incorrect, 9.68 and 9.72 will be in the sequence but not 9.7.

The terms are increasing by 0.04, therefore 9.7 will not be in the sequence.

Reasoning 2

Decimal Sequences

	1st Sequence	Relationship →	2nd Sequence
1st term	0.1		1
2nd term	0.2		2
3rd term	0.3		3
4th term	0.4		4
5th term			

I wonder what the differences would be between sequences that go up in + 0.01 and +1 sequence...

Tia compared the two sequences above.
What do you notice about the differences between the terms in the two sequences?
Investigate Tia's sequences and explain your thinking.

Reasoning 2 Decimal Sequences

	1st Sequence	Relationship →	2nd Sequence
1st term	0.1		1
2nd term	0.2		2
3rd term	0.3		3
4th term	0.4		4
5th term			

I wonder what the differences would be between sequences that go up in + 0.01 and +1 sequence...

The difference between the terms is increasing by 0.9 each time e.g.
1st+ 0.9
2nd+ 1.8
3rd+ 2.7
4th+ 3.6

The differences would increase by 0.99 each time.

Discuss

Decimal Sequences

What do the terms ‘increasing’ and ‘decreasing’ mean?

Is the sequence increasing by the same amount each time?
By how much?

What is the same about each term?
What is changing in each term?

What will the next term in the sequence be?

Multiply by 10, 100 and 1,000

5

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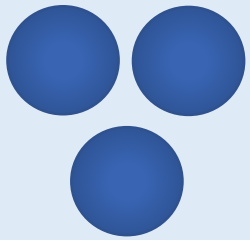
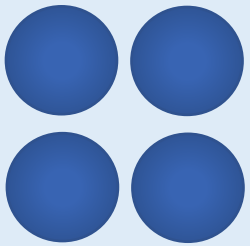
Activity 1 Multiply by 10, 100 and 1,000

Use the place value grid to multiply 3.24 by 10, 100 and 1,000.

Hundreds	Tens	Ones	Tenths	Hundredths
				

When you multiply by _____, you move the counters

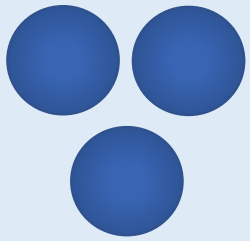
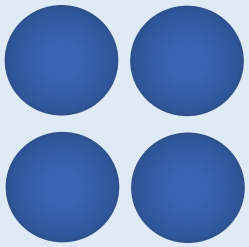
_____ place(s) to the left.

?

What is the value of each digit? Where would these digits move to if I multiplied the number by 10?

Activity 1 Multiply by 10, 100 and 1,000

Use the place value grid to multiply 3.24 by 10, 100 and 1,000.

Hundreds	Tens	Ones	Tenths	Hundredths
				

When you multiply by 10, you move the counters one place(s) to the left.

3.24 x 10 = 32.4 3.24 x 100 = 324 3.24 x 1000 = 3,240

Activity 2 Multiply by 10, 100 and 1,000

Use a place value grid to multiply these decimals by 10, 100 and 1,000.

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths

3.67

56.6

Activity 2 Multiply by 10, 100 and 1,000

Use a place value grid to multiply these decimals by 10, 100 and 1,000

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths

3.67

3.67 x 10 = 36.7
3.67 x 100 = 367
3.67 x 1000 = 3,670

56.6

56.6 x 10 = 566
56.6 x 100 = 5,660
56.6 x 1000 = 56,600

Activity 3 Multiply by 10, 100 and 1,000

Complete the table below.

	x 10	x 100	x 1,000
5.61			
0.456			
		213	
			5,679
1.45			

?

What do you notice about the numbers you are multiplying in the table?

Activity 3 Multiply by 10, 100 and 1,000

Complete the table below.

	x 10	x 100	x 1,000
5.61	56.1	561	5,610
0.456	4.56	45.6	456
2.13	21.3	213	2,130
5.679	56.79	567.9	5,679
1.45	14.5	145	1,450

Reasoning 1

Multiply by 10, 100 and 1,000

Tia

Multiplying by 1,000 is the same as doing $10 \times 10 \times 10$.

Do you agree with Tia? Explain your answer.

Reasoning 1

Multiply by 10, 100 and 1,000

Tia

Multiplying by 1,000 is the same as doing $10 \times 10 \times 10$.

Do you agree with Tia?
Explain your answer.

Tia is correct, as you move the digits three places to the left in both cases.

Reasoning 1

Multiply by 10, 100 and 1,000

Using the digits 0-9, create a number with up to three decimal places, for example, 3.451. Cover the number using counters on your Gattegno chart.

10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009

Explore what happens when you multiply your number by 10, then 100, then 1,000.

What patterns do you notice?

Reasoning 1

Multiply by 10, 100 and 1,000

Using the digits 0-9, create a number with up to three decimal places, for example, 3.451. Cover the number using counters on your Gattegno chart.

10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009

Explore what happens when you multiply your number by 10, then 100, then 1,000
What patterns do you notice?

Children will be able to see how the counter will move up a row for multiplying by 10, two rows for 100 and three rows for 1,000. They can see that this happens to each digit regardless of the value. For example, 3.451 × 10 becomes 34.51. Each counter moves up a row but stays in the same column.

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Discuss

Multiply by 10, 100 and 1,000

What is the value of each digit? Where would these digits move to if I multiplied the number by 10?

Why is the zero important in this number? Could we just take it out to make it easier for ourselves? Why/why not?

What do you notice about the numbers you are multiplying in the table?

Divide by 10, 100 and 1,000

5

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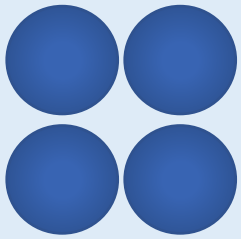
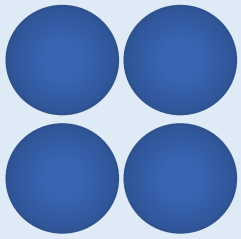
Activity 1 — Divide by 10, 100 and 1,000

Use the place value grid to divide 14.4 by 10, 100 and 1,000.

H	T	O	Tths	Hths	Thths
					

When you divide by _____, you move the counters

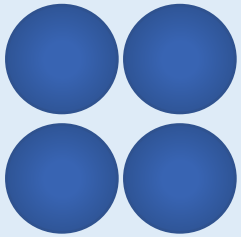
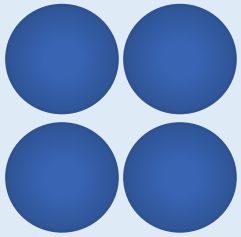
_____ place(s) to the right.

?

What is the value of each digit? Where would these digits move to if I divided the number by 10?

Activity 1 Divide by 10, 100 and 1,000

Use the place value grid to divide 14.4 by 10, 100 and 1,000.

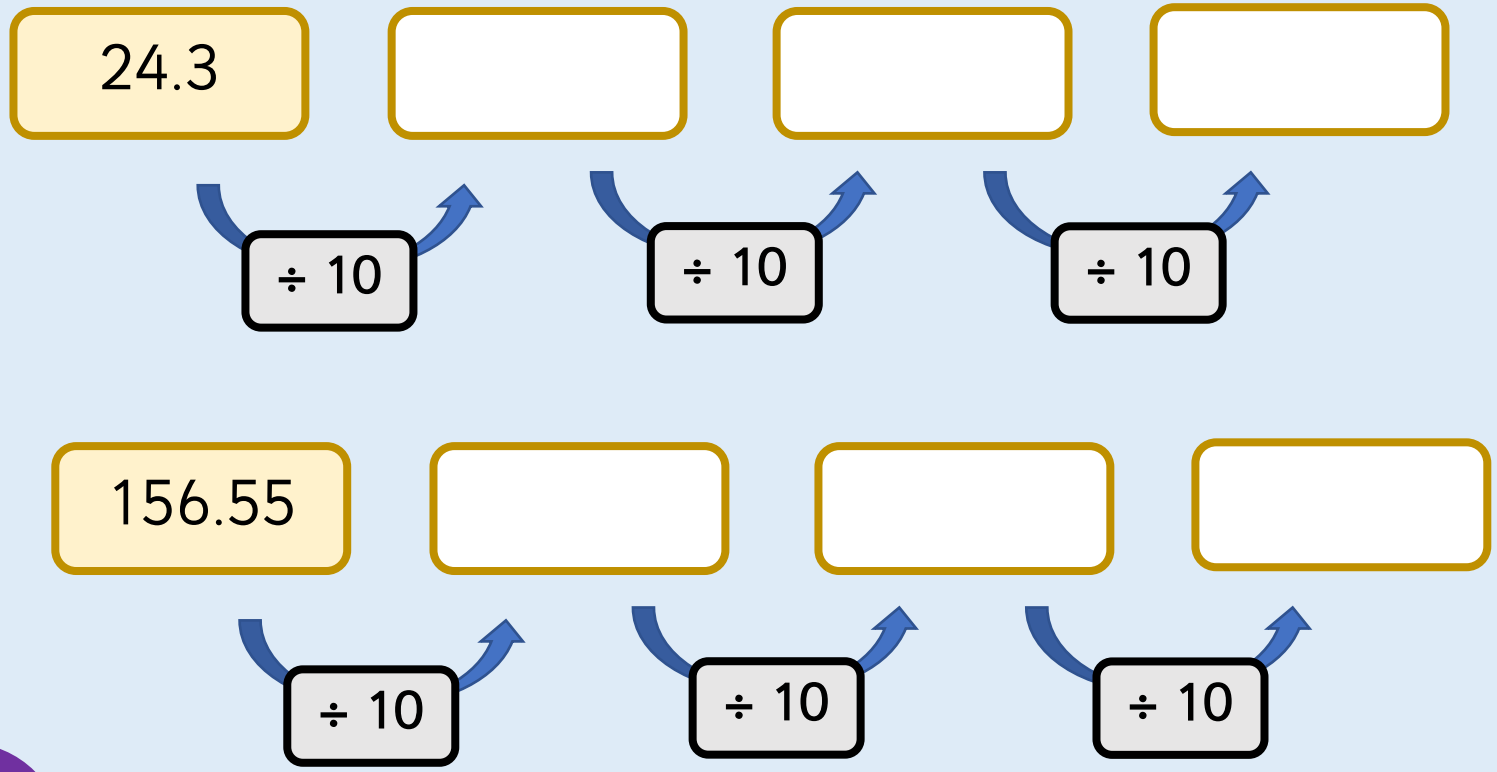
H	T	O	Tths	Hths	Thths
					

When you divide by 10, you move the counters 1 place(s) to the right.

14.4 ÷ 10 = 1.44 14.4 ÷ 100 = 0.144 14.4 ÷ 1000 = 0.0144

Activity 2 Divide by 10, 100 and 1,000

Fill in the missing numbers in the diagram.

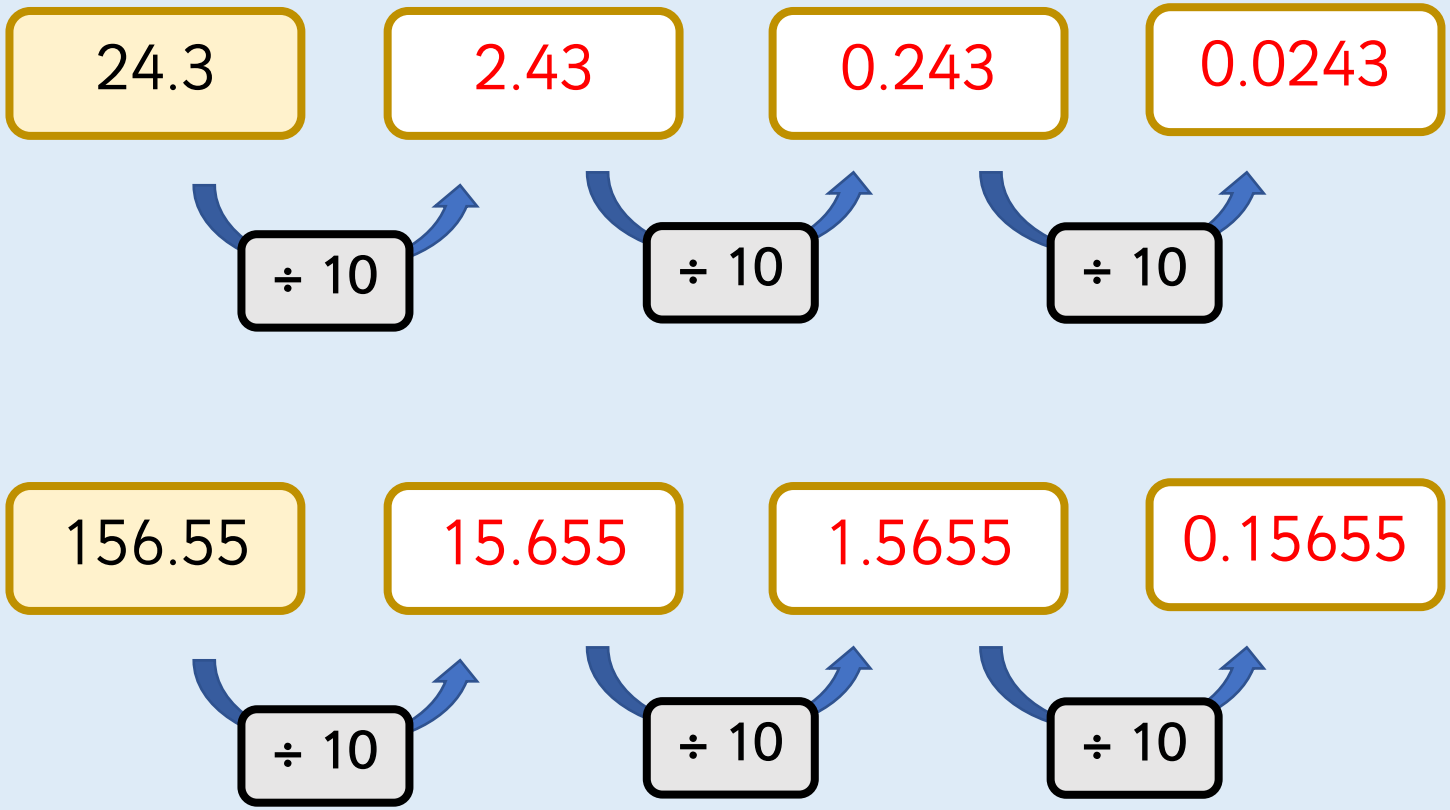


?

Which direction do I move the digits of the number when dividing by 10, 100 and 1,000?

Activity 2 Divide by 10, 100 and 1,000

Fill in the missing numbers in the diagram.



Activity 3 Divide by 10, 100 and 1,000

Fill in the missing numbers in these calculations.

$34.2 \div \square = 0.342$

$\square \div 10 = 54.1$

$\square \div 10 = 1.93$

Activity 3 — Divide by 10, 100 and 1,000

Fill in the missing numbers in these calculations.

$34.2 \div$ 100 $= 0.342$

541 $\div 10 = 54.1$

19.3 $\div 10 = 1.93$

Reasoning 1

Divide by 10, 100 and 1,000

If you multiply a number by 1,000, you can just divide the answer by 1,000 to get back to your original number.

Rosie

That's not true, you would need to divide the answer by 10 three times.

Leanna

Who do you agree with?
Explain your thinking.

Reasoning 1

Divide by 10, 100 and 1,000

Rosie

If you multiply a number by 1,000, you can just divide the answer by 1,000 to get back to your original number.

That's not true, you would need to divide the answer by 10 three times.

Leanna

Who do you agree with?
Explain your thinking.

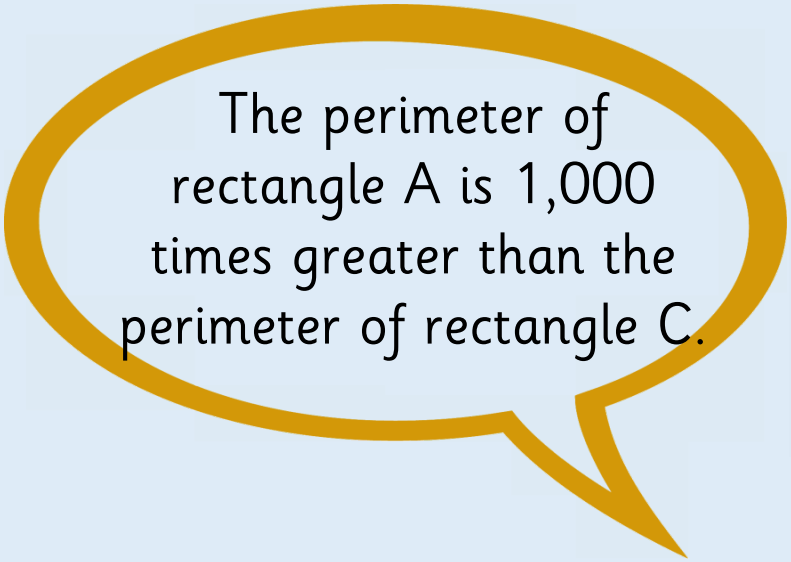
Both girls are correct, as dividing by 1,000 is the same as dividing by 10 three times.

Reasoning 2 Divide by 10, 100 and 1,000

Here are three rectangles.

The lengths of rectangle B are 10 times larger than rectangle A.
The lengths of rectangle C are 100 times smaller than rectangle B.

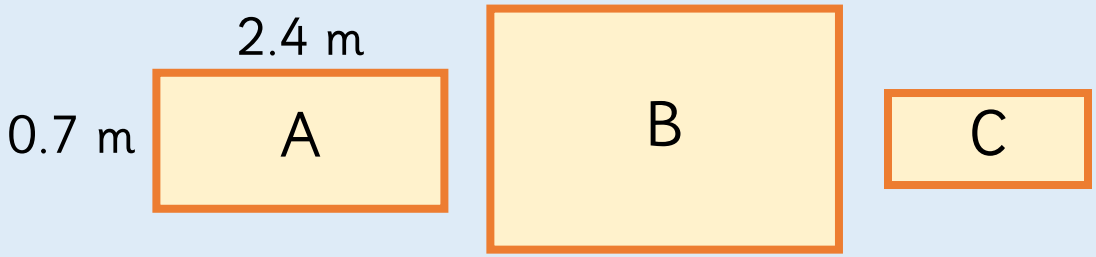
Do you agree with Malachi?
Explain your thinking.



Malachi

Reasoning 2 Divide by 10, 100 and 1,000

Here are three rectangles.



The lengths of rectangle B are 10 times larger than rectangle A.
The lengths of rectangle C are 100 times smaller than rectangle B.

Do you agree with Malachi?
Explain your thinking.

Malachi is incorrect.

He has multiplied 10 and 100 to get 1,000 times greater.

The perimeter of rectangle A is only 10 times greater than rectangle C.

Children may calculate the perimeters of each rectangle or may just notice the relationship between each.

Discuss

Divide by 10, 100 and 1,000

What is the value of each digit? Where would these digits move to if I divided the number by 10?

Which direction do I move the digits of the number when dividing by 10, 100 and 1,000?