



Maths

Number and Place Value

Need a coherently planned sequence of lessons to complement this resource?

Lesson Breakdown

Below is our suggestion for the most coherent and progressive sequence to teach this area of Year 6 Maths. Steps on the White Rose Maths scheme of learning although we have not aimed to mirror the exact order in which they are presented.

Read, write, order and compare numbers (1): Powers of 10 up to 1 Mill
Children identify the relationships between powers of 10 from one thousand to one million. They use their understanding of the relationships between powers of 10 to scale up and down by multiplying and dividing by powers of 10. This is also visually demonstrated using place value charts. The focus is on the relationships between powers of 10 and how they are used to solve problems.

NC Statement: Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.
Lesson Aim: To understand the relationship between powers of 10 from 1 hundredth to 10 million.

Read, write, order and compare numbers (2): Dividing Powers of 10 into smaller parts
Children identify the relationships between powers of 10 from one thousand to one million. They use their understanding of the relationships between powers of 10 to scale up and down by multiplying and dividing by powers of 10. This is also visually demonstrated using place value charts. The focus is on the relationships between powers of 10 and how they are used to solve problems.

NC Statement: Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.
Lesson Aim: To divide powers of 10 into 2, 4, 5 and 10 equal parts.

Introduction

In this unit, the children read and write numbers up to 10 000 000 and continue to identify the value of individual digits in a number. They revisit comparisons of numbers using the greater than and less than symbols and then further develop their skills by reasoning about numbers. Children will focus on rounding numbers to any given degree of accuracy and will also investigate reasoning problems based on rounding numbers. They will work with negative numbers, ordering and comparing them and calculating intervals across zero. They will use negative numbers in context to solve problems. Finally, children will have the opportunity to use all their number and place value skills to solve a range of problems.

Resources
Dice, Gattegno charts, place value charts, place value counters, whiteboards and markers.

Assessment Statements
By the end of this unit, children working towards the expected level will be able to:

- read and write numbers up to 1 000 000;
- identify the value of each digit in a number up to 1 000 000;
- identify the value of a digit in numbers with two decimal places;
- order numbers up to 1 000 000;
- compare numbers using the greater than and less than symbols;
- round numbers to a required degree of accuracy using a number line;
- calculate intervals across zero using a number line;
- compare and order negative numbers;
- solve simple problems involving negative numbers in context;
- solve simple reasoning problems using all of the above.

children working at the expected level will be able to:

- read and write numbers up to 10 000 000;
- identify the value of each digit in a number 000 000;
- identify the value of a digit in numbers decimal places;
- order numbers up to 10 000 000;
- compare numbers by working out calculated intervals across zero;
- solve problems involving negative numbers in context;
- solve reasoning problems using all of the above.

Number and Place Value
Maths | Year 6 | Skills to Progress Overview

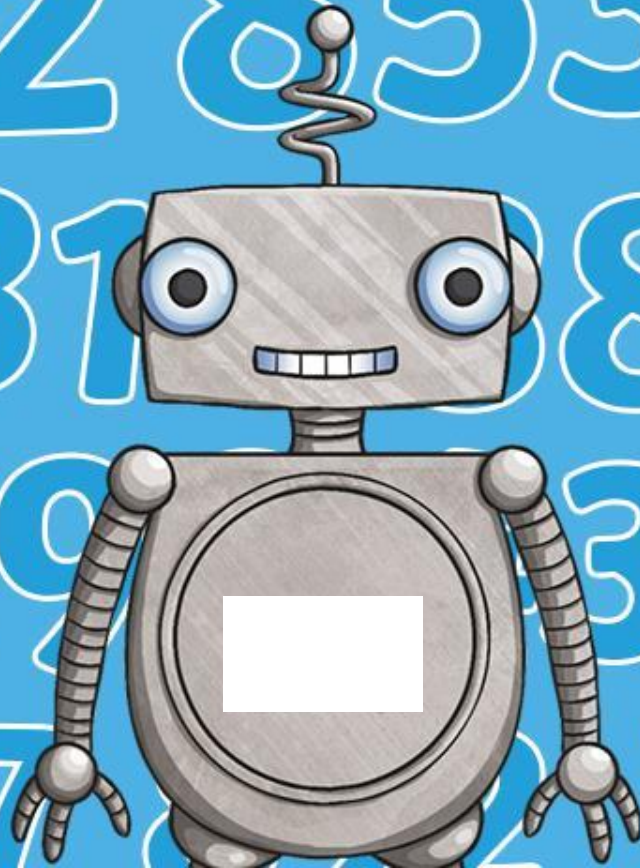
The aim of the overview is to support teachers using PlanIt Maths to show the most coherent and progressive sequence to teach each area of maths. We also want to fully support teachers who use the White Rose Maths scheme of learning to make full use of the resources available within PlanIt Maths. Wherever possible, lesson packs have been matched to each of the small steps on the White Rose Maths scheme of learning.

Yearly Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value			Number: Addition, Subtraction, Multiplication and Division							Ordering: Position and Direction	Consolidation
Spring	Number: Decimals		Number: Percentages		Number: Algebra		Measurement: Converting Units	Measurement: Perimeter, Area and Volume			Number: Ratio	Consolidation
Summer	Geometry: Properties of Shapes		Problem Solving			Statistics			Investigations			Consolidation

Powers of 10

Rounding



Aim

- To round numbers to a required degree of accuracy.

Success Criteria

- I can find the midpoint on a number line when rounding.
- I can use the midpoint to determine whether a number should be rounded up or down.
- I can identify which digits to round up and which digits to round down.

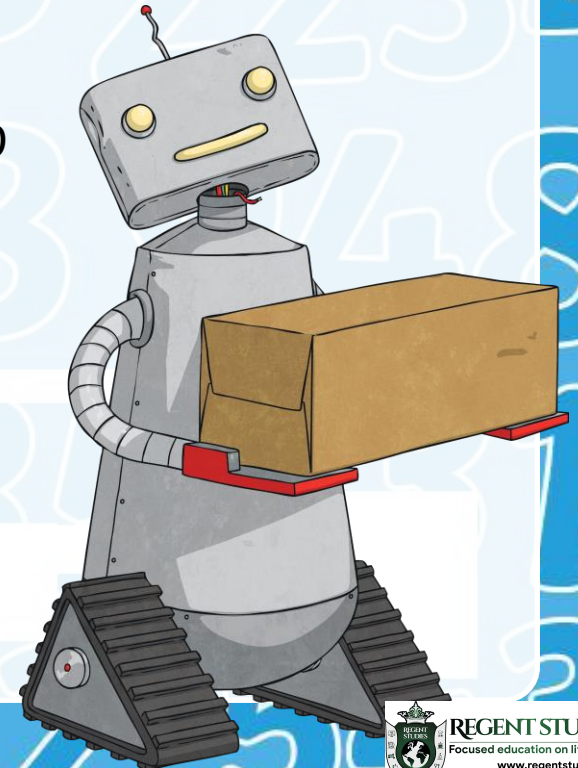
Remember It



Use each of these terms once to complete the calculations.

$\times 10$	$\times 100$	$\times 1000$
$\div 10$	$\div 100$	$\div 1000$

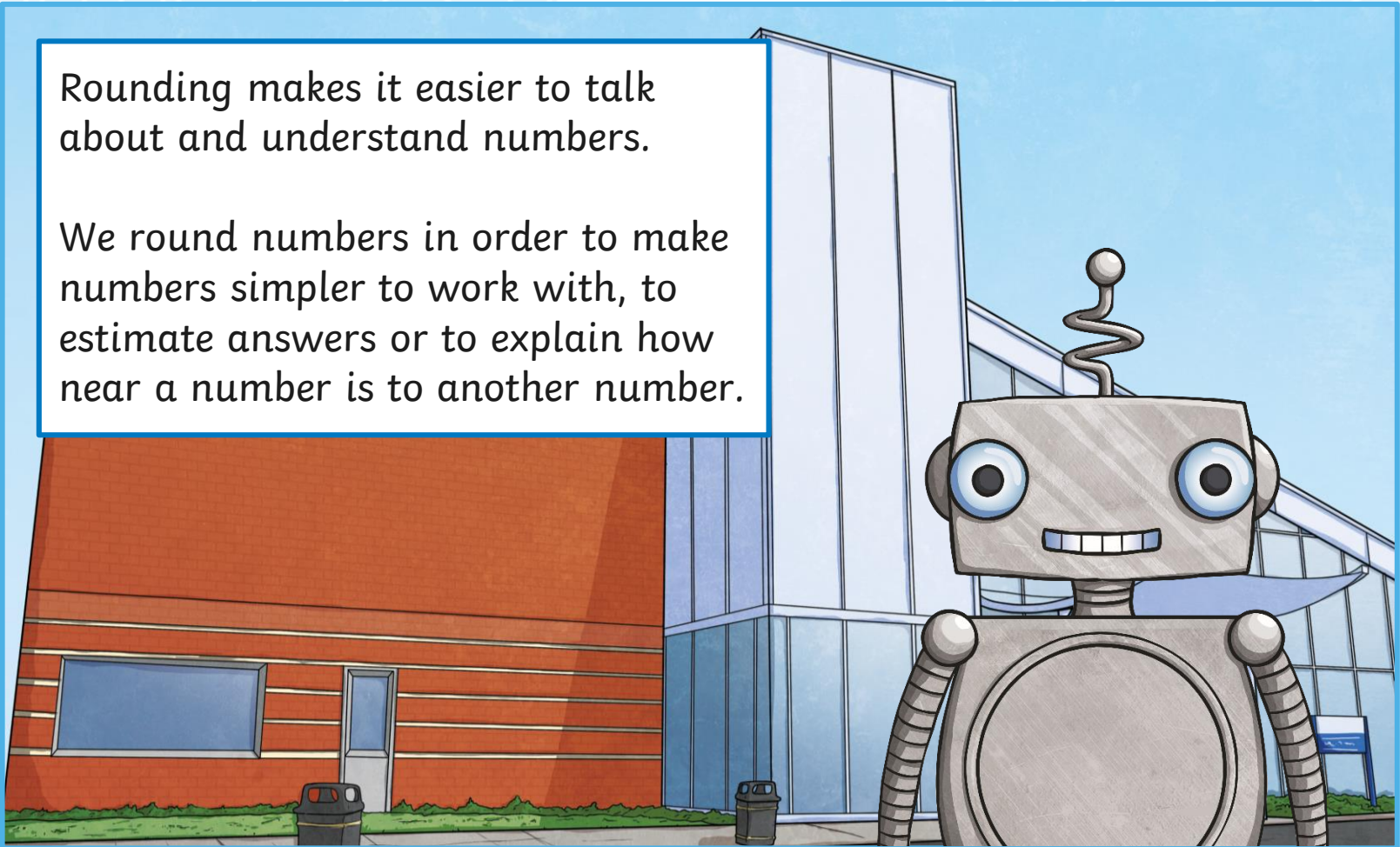
- 1 275 = 2.75
- 2 3 693 = 3 693 000
- 3 732 = 7 320
- 4 921 093 = 92 109.3
- 5 3 500 = 3.5
- 6 216 = 21 600



Rounding

Rounding makes it easier to talk about and understand numbers.

We round numbers in order to make numbers simpler to work with, to estimate answers or to explain how near a number is to another number.



Rounding Accurately

We can round numbers to different degrees of accuracy. Sometimes, it is useful to round a number to the nearest 10. Other times we may round a number to the nearest 100, 1000, 10 000, 100 000 or 1 000 000.

In order to round to a given degree of accuracy, we need to know which digit to consider to tell us whether to round up or round down.

The rule for identifying which digit to consider is to look at the digit in the place before the value we are rounding to.

We can then use a number line to help determine whether a number rounds up or down. **Let's look at some examples.**

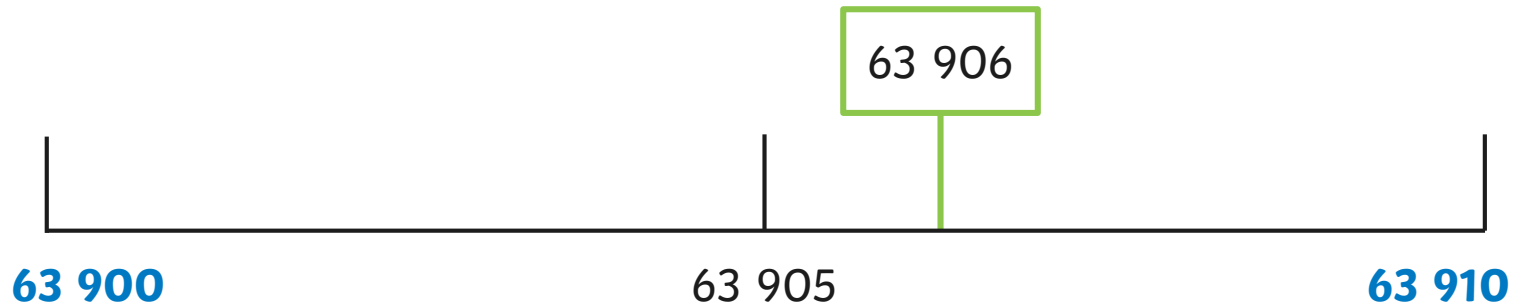


Rounding Accurately



Let's look at rounding 63 906 to the nearest 10.

The number is closer to 63 910 than 63 900. In this case, 63 906 rounds up to 63 910 when rounding to the nearest **10**.



Finding the midpoint helps to position the number on the number line.

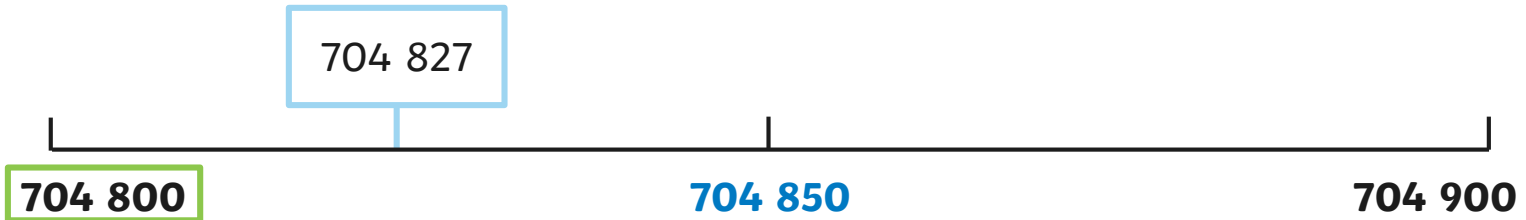
Rounding Accurately



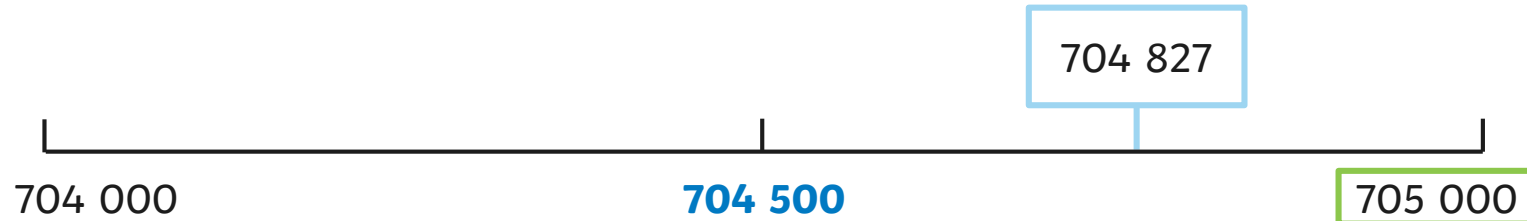
The same method works when rounding larger numbers.

What is **704 827** rounded to the nearest 100, 1 000, 10 000 and 100 000?

Rounded to the nearest 100



Rounded to the nearest 1 000



Rounding Accurately



Choose a section and try rounding these numbers.
Blank number lines might be helpful.

★ Round to the nearest 100 and 1 000	★★ Round to the nearest 100, 1 000 and 10 000	★★★ Round to the nearest 10, 100, 1 000, 10 000 and 100 000
205 6 738	15 603 593 039	999 901 801 999

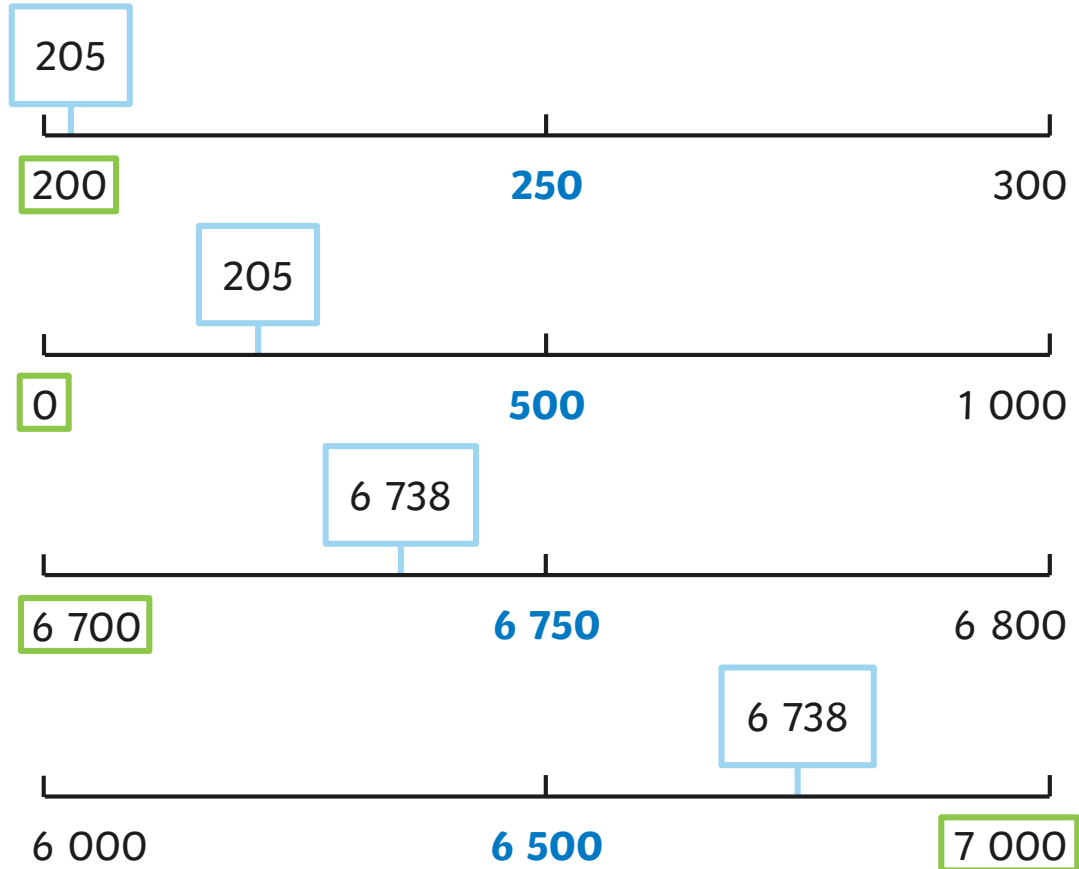
Rounding Accurately



Let's check to see how you got on.

★
Round to the nearest
100 and 1 000

205
6 738



Rounding Accurately



Let's check to see how you got on.

★★ Round to the nearest 100, 1 000 and 10 000	To the Nearest 100	To the Nearest 1 000	To the Nearest 10 000
15 603 593 039			

Rounding Accurately



Let's check to see how you got on.

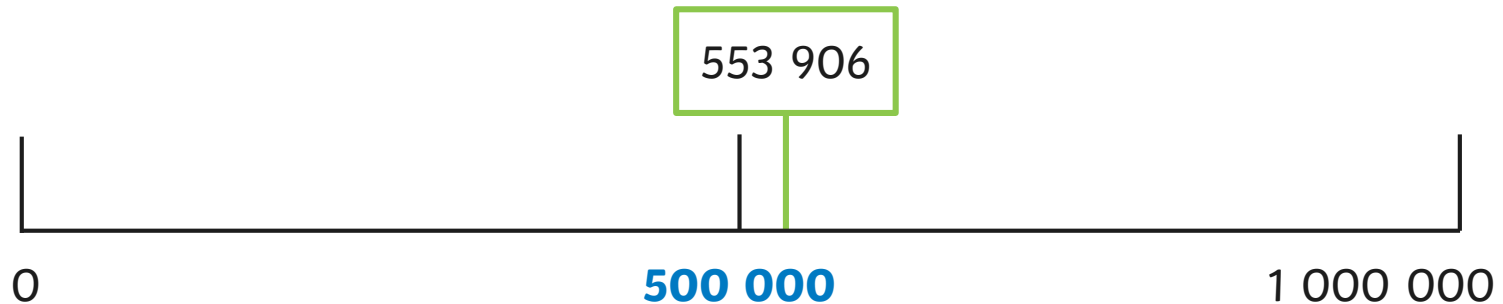
★★★ Round to the nearest 10, 100, 1 000, 10 000 and 100 000	To the Nearest 10	To the Nearest 100	To the Nearest 1 000	To the Nearest 10 000	To the Nearest 100 000
999 901					
801 999					

Rounding Accurately



We follow the same steps to round to the nearest 1 000 000.
What is 553 906 rounded to the nearest 1 000 000?

553 906 has been placed beyond the midpoint. In this case, 553 906 rounds up to 1 000 000 when rounding to the nearest 1 000 000.



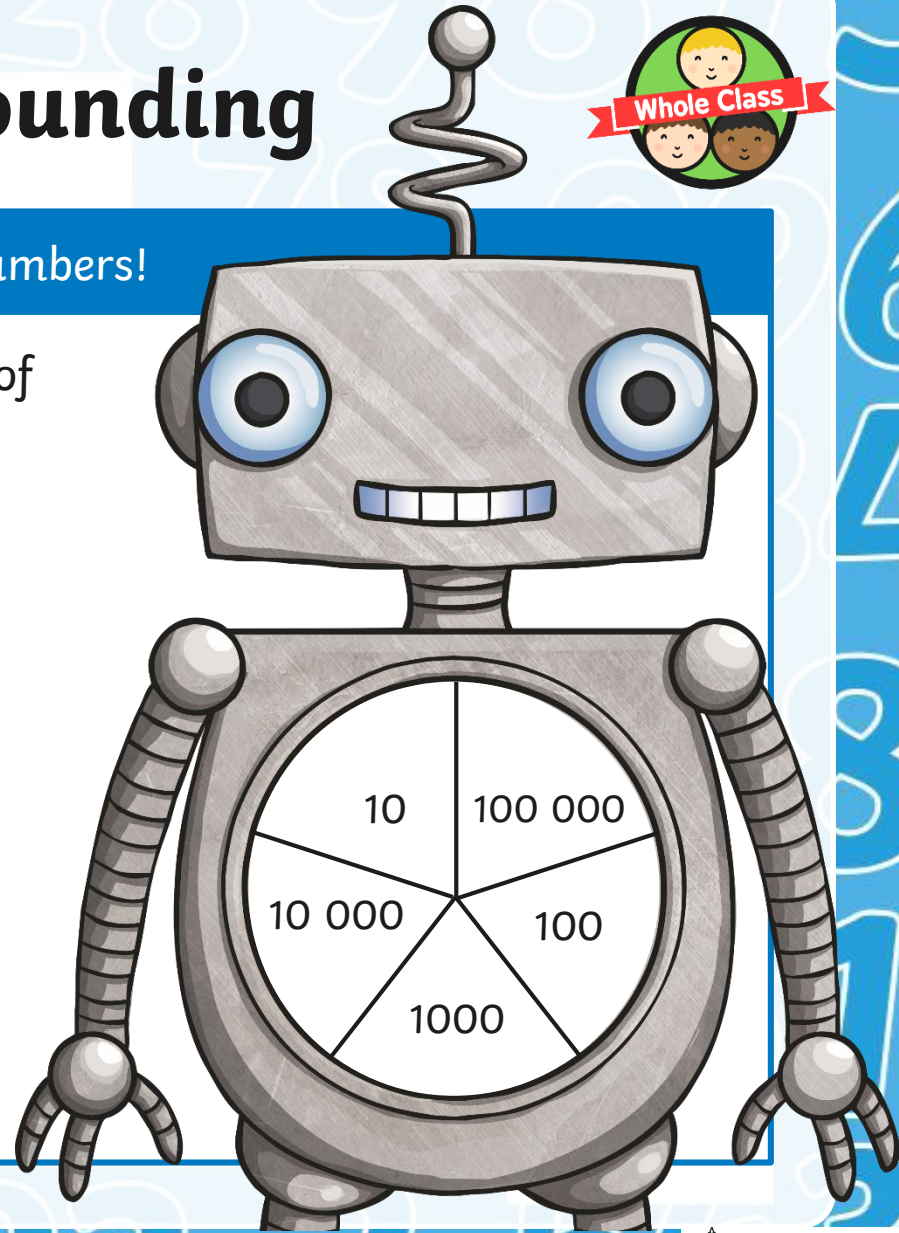
Robot Rounding



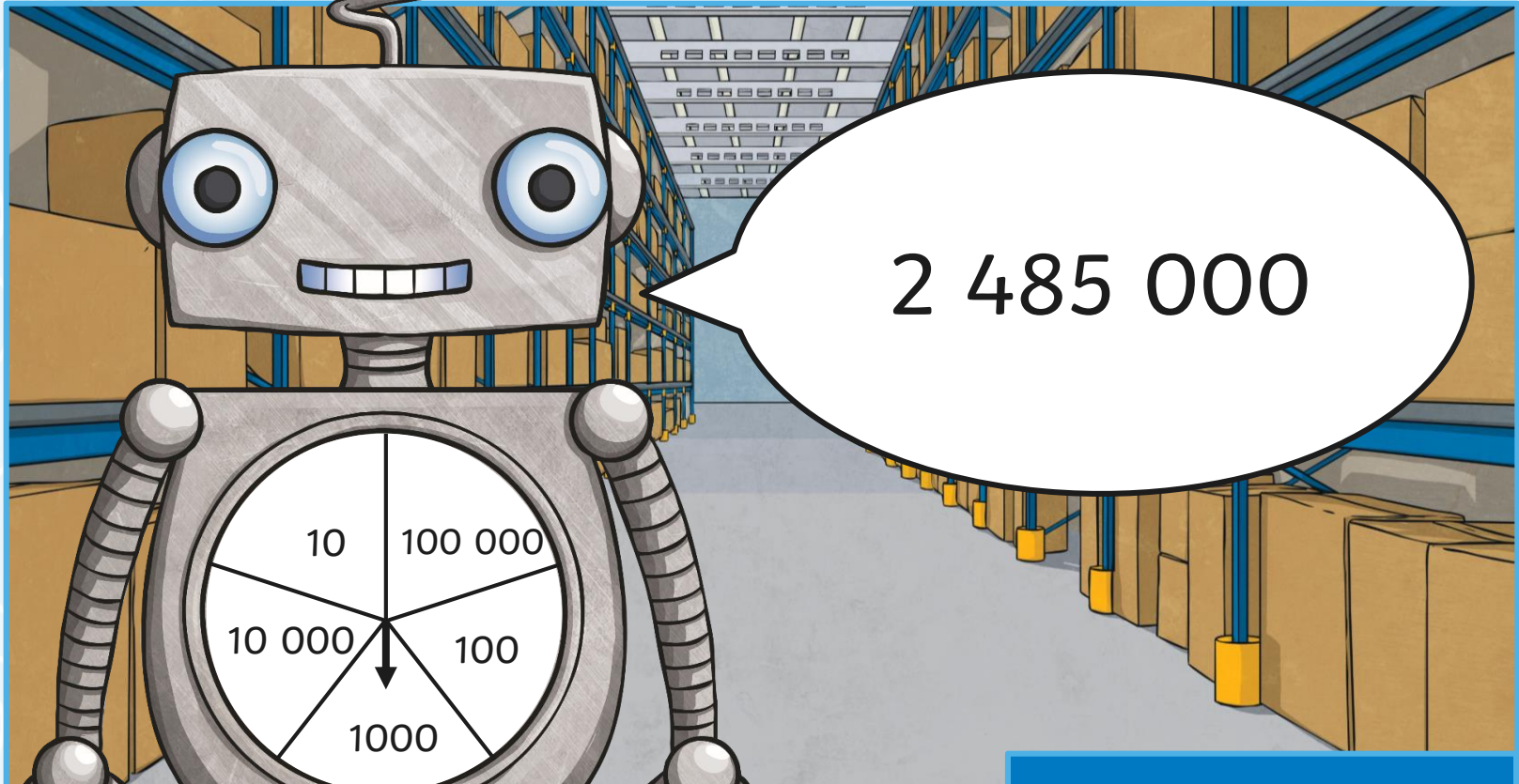
These robots are designed to round numbers!

The dial on the front sets the degree of accuracy. The robot takes a number and rounds it to the correct degree.

Can you give the number that each robot should say? Click the speech bubble to reveal the answer!



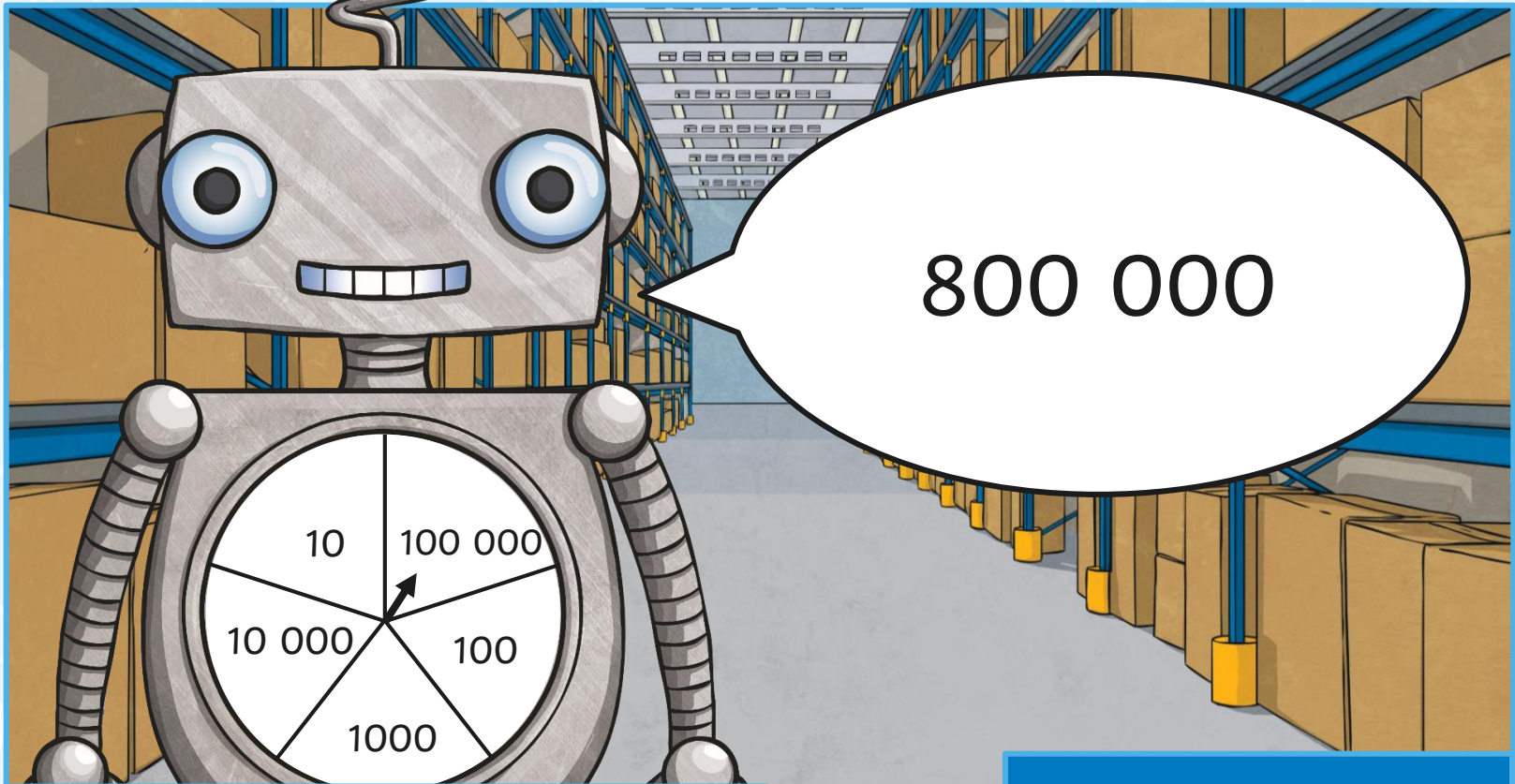
Robot Rounding



2 485 000

Click the robot to reveal the answer!

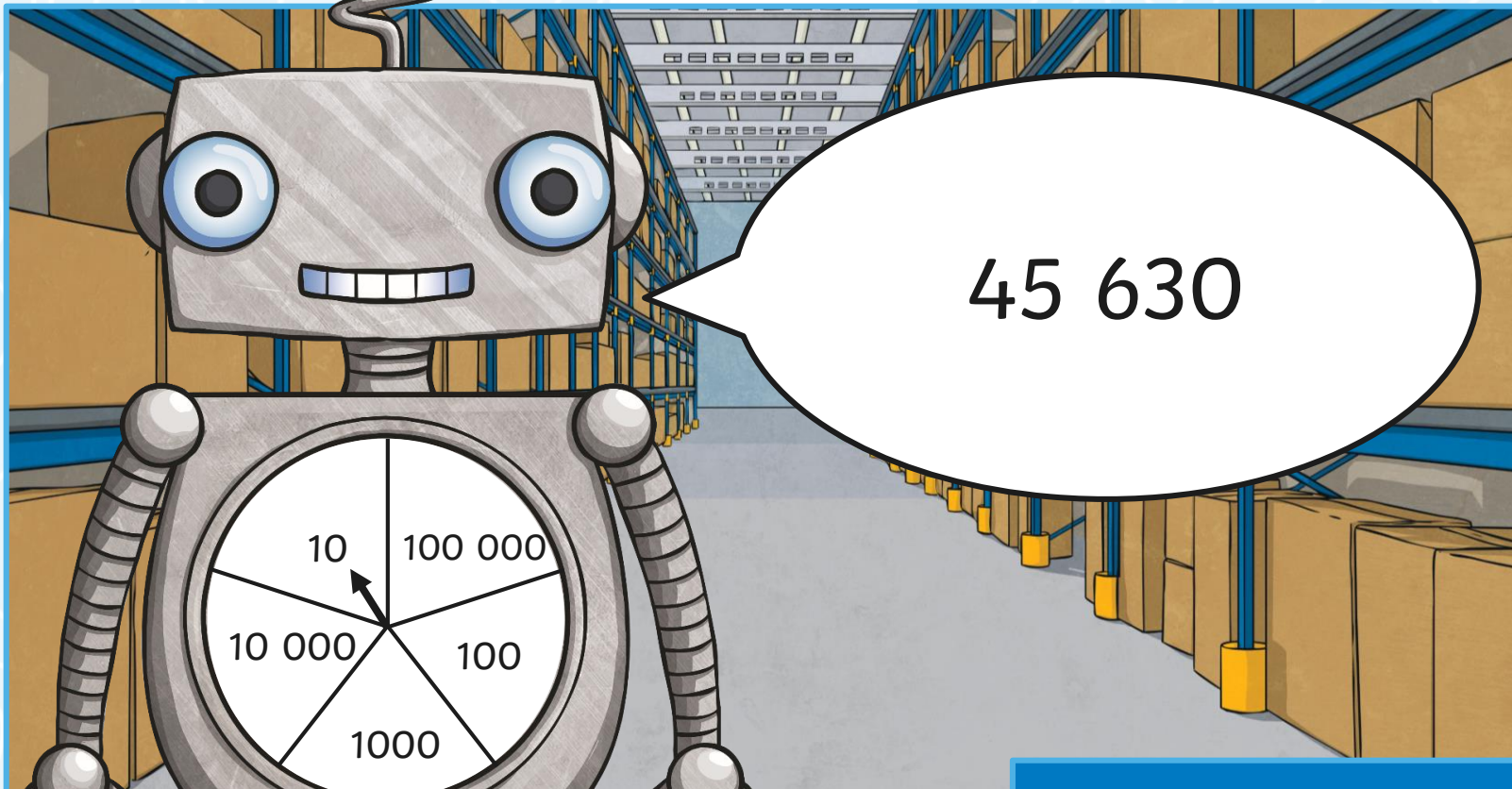
Robot Rounding



783 924

Click the robot to
reveal the answer!

Robot Rounding



45 628

Click the robot to
reveal the answer!

Robot Rounding Activity



Use the dial on your **Robot Rounding Activity Sheet** to play a rounding game with your partner.

To use the dial, place a paper clip in the centre of the dial. Place the point of your pencil inside the paper clip, on the exact centre of the dial. Spin the paper clip around the point of your pencil to play!

The aim of the game is to get the most points. You get one point for every number you round correctly.

Look at the first number in the 'Input' column. Spin the robot's dial to find the degree of accuracy. Record this in the 'Round to the Nearest...' column. Then round the number to the required degree of accuracy. Record your answer in the 'Output' column. Take turns to spin the dial and round each of the numbers in the 'Input' column.

Robot Rounding

To round numbers to a required degree of accuracy.

Player 1			Player 2		
Input	Round to the nearest...	Output	Input	Round to the nearest...	Output
427 813			65 284		
64 231			838 421		
73 453			748 621		
982 165			27 458		
534 891			384 721		
573 356			47 563		
48 274			472 274		

Robot Rounding

To round numbers to a required degree of accuracy.

Player 2		
Input	Round to the nearest...	Output
65 284		
838 421		
748 621		
27 458		
384 721		
47 563		
472 274		

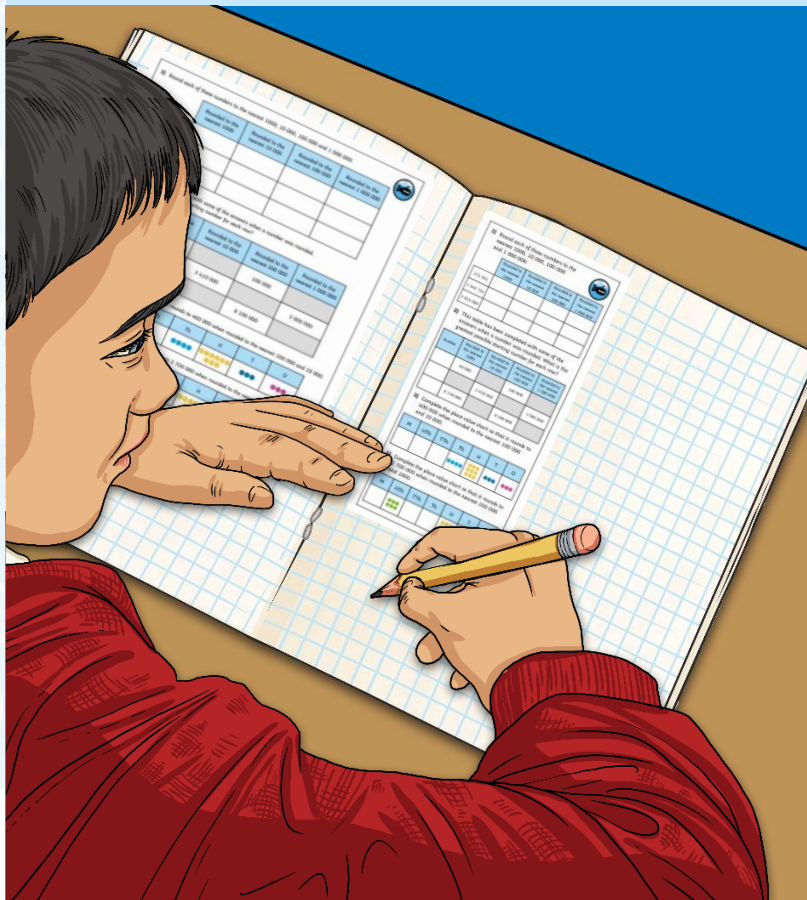
Robot Rounding

To round numbers to a required degree of accuracy.

Player 2		
Input	Round to the nearest...	Output
65 284		
838 421		
748 621		
27 458		
384 721		
47 563		
472 274		

Diving into Mastery

Dive in by completing your own activity!



1) Round each of these numbers to the nearest 1000, 10 000, 100 000 and 1 000 000.

	Rounded to the nearest 1000	Rounded to the nearest 10 000	Rounded to the nearest 100 000	Rounded to the nearest 1 000 000
275 691				
1 565 724				
3 813 089				

2) This table has been completed with some of the answers when a number was rounded. What is the greatest possible starting number for each row?

Number	Rounded to the nearest 1000	Rounded to the nearest 10 000	Rounded to the nearest 100 000	Rounded to the nearest 1 000 000
	50 000		100 000	
		3 410 000		3 000 000
	8 110 000		8 100 000	

3) Complete the place value chart so that it rounds to 400 000 when rounded to the nearest 100 000 and 10 000.

M	HTh	TTh	Th	H	T	O
			●●●●	●●●●●●	●●●	●●●

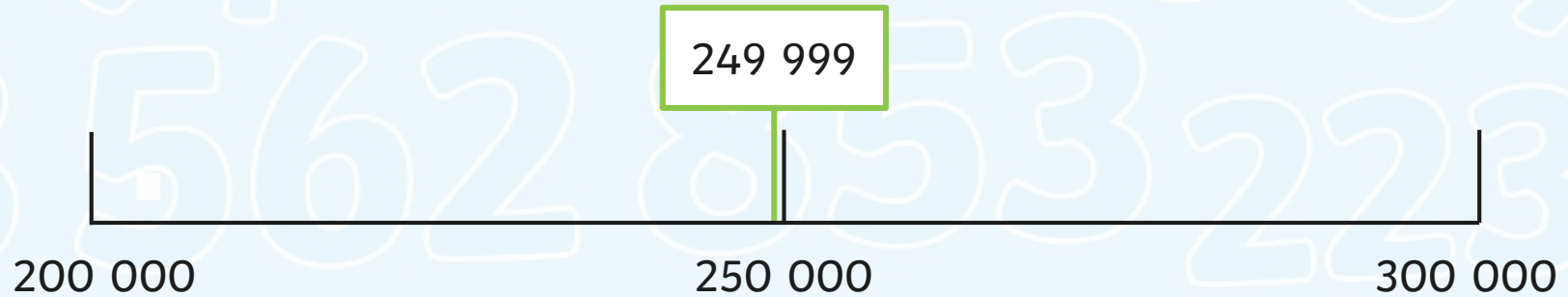
4) Complete the place value chart so that it rounds to 2 700 000 when rounded to the nearest 100 000 and 1000.

M	HTh	TTh	Th	H	T	O
●●●●●				●●●●●	●●●●	●●●●●

Rounding and Reasoning



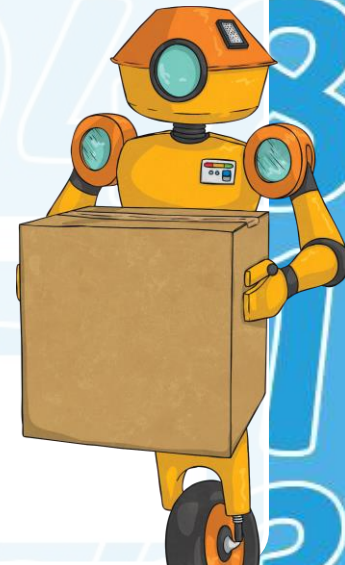
What is the largest whole number that rounds to 200 000 when rounded to the nearest 100 000?



200 000

249 999

349 999

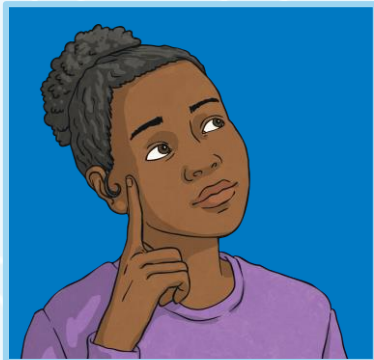


Rounding and Reasoning



Three children have rounded 390 908 to the nearest 10 000.

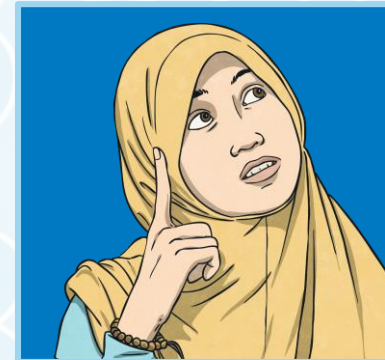
Which of the children do you agree with? **Explain your answer.**



390 900



390 000



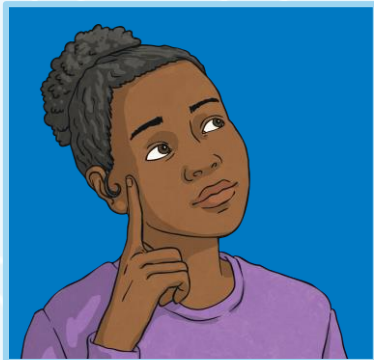
400 000

Can you explain the mistakes the other children have made?

Rounding and Reasoning



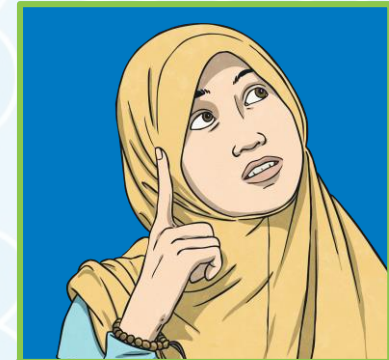
Three children have rounded 550 000 to the nearest 1 000 000.
Which of the children do you agree with? **Explain your answer.**



0



390 000



1 000 000

Can you explain the mistakes the other children have made?

Rounding and Reasoning



Is Jared's statement possible? **Explore and reason with a partner.**



My number is less than one million, but when rounded to the nearest 10, 100, 1 000, 10 000 and 100 000, **is** one million.

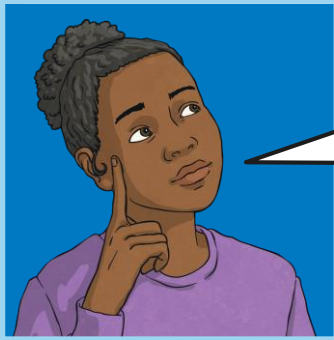
Yes. Jared's statement is possible. For example, 999 999 rounds to one million when rounded to the nearest 10, 100, 1 000, 10 000 and 100 000.

Additionally, the numbers 999 998, 999 997, 999 996 and 999 995 would prove Jared's statement to be correct.

Rounding and Reasoning



With a partner, prove Mercia's statement to be incorrect.
Use a number line to help justify your reasoning.



It is impossible to round numbers with decimals because you cannot find a midpoint on a number line.

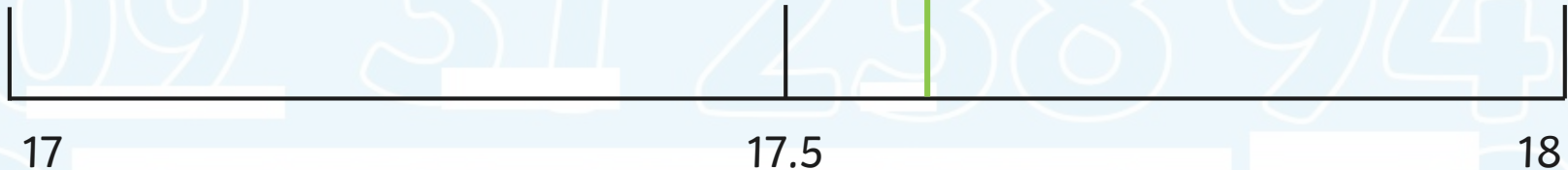
Rounding and Reasoning



Mercia's statement is incorrect. Numbers with decimals can also be rounded using a number line. In this example, 17.6 is rounded to the nearest whole number.



It is impossible to round numbers with decimals because you cannot find a midpoint on a number line.



17.5 is the midpoint between 17 and 18. As $\frac{6}{10}$ sits beyond $\frac{5}{10}$ on the number line, 17.6 rounds up to 18 when rounded to the nearest whole number.

Aim



- To round numbers to a required degree of accuracy.

Success Criteria

- I can find the midpoint on a number line when rounding.
- I can use the midpoint to determine whether a number should be rounded up or down.
- I can identify which digits to round up and which digits to round down.

765.395289873
991 6789 78 096
8 562 853 2234
309 31 238 948
9 5698 435 -31
63 567 892 2.543

