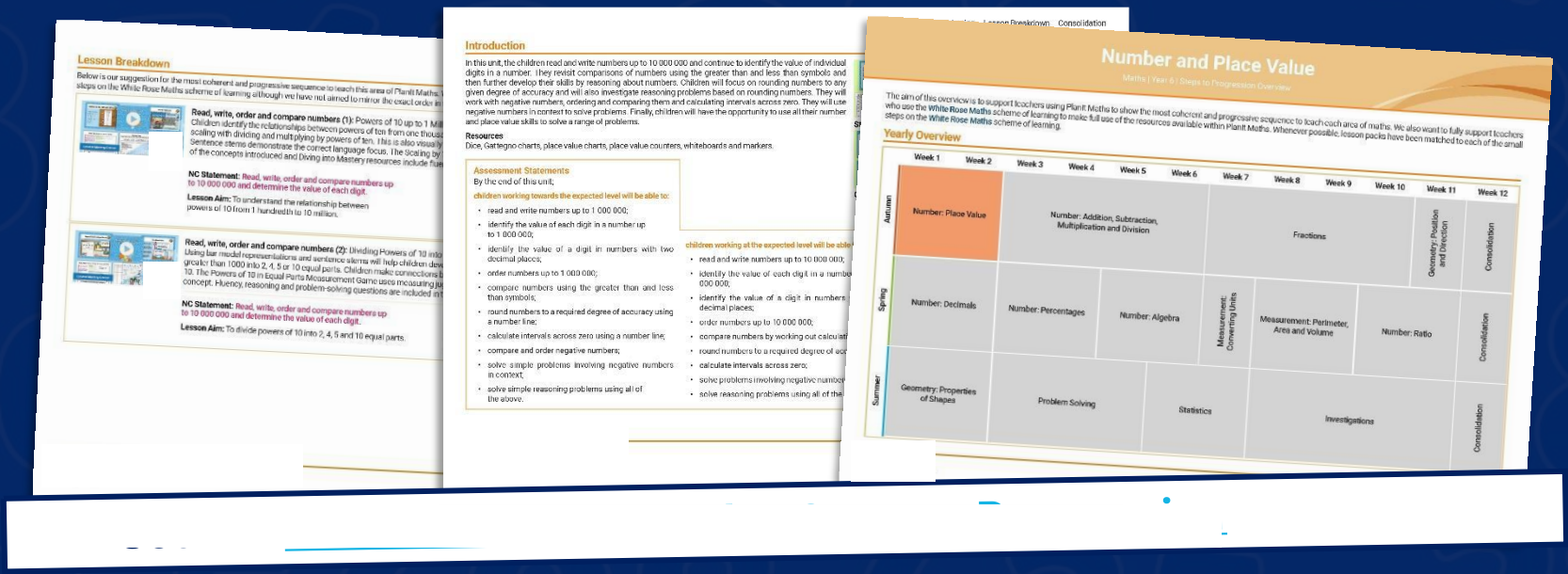
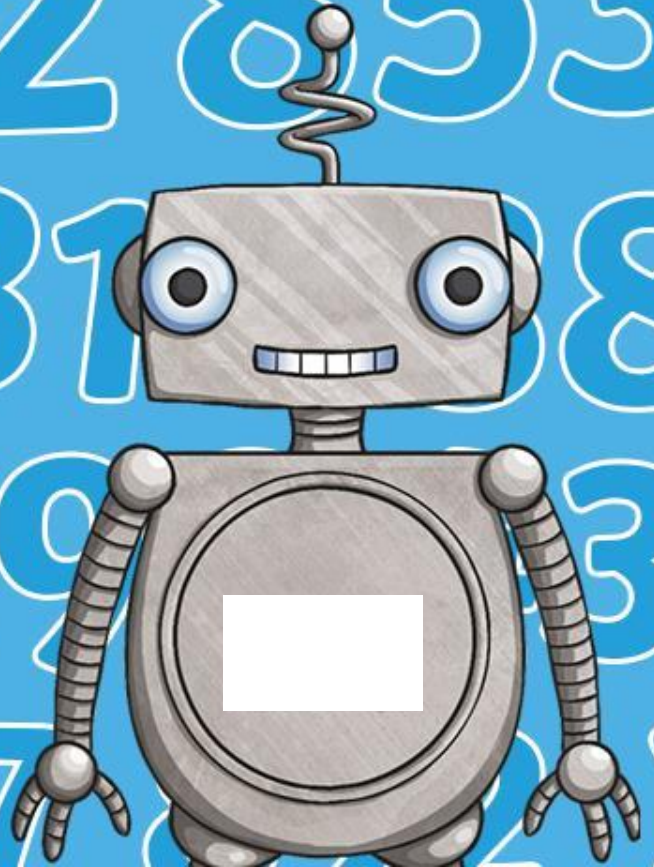
Maths

Number and Place Value

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



Powers of 10
Rounding



Aim

- To round numbers to a required degree of accuracy.

Success Criteria

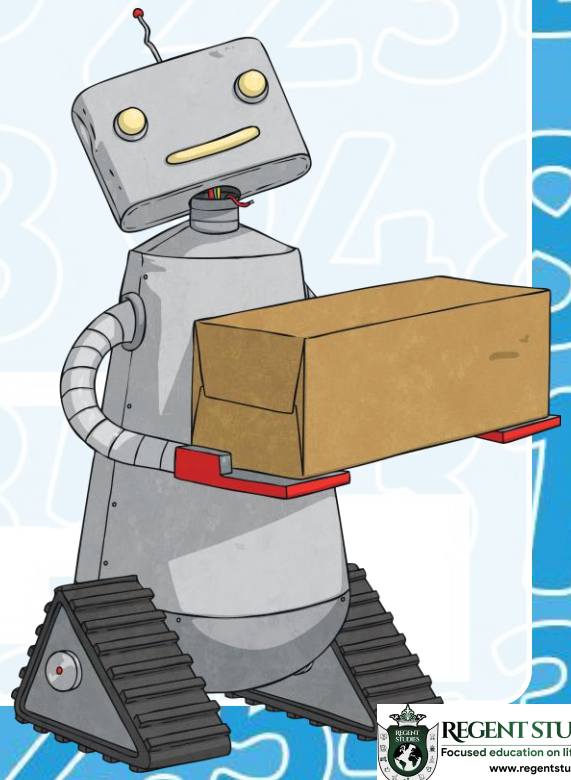
- I can find the midpoint on a number line when rounding.
- I can use the midpoint to determine whether a number should be rounded up or down.
- I can identify which digits to round up and which digits to round down.

Remember It

Use each of these terms once to complete the calculations.

× 10	× 100	× 1000
÷ 10	÷ 100	÷ 1000

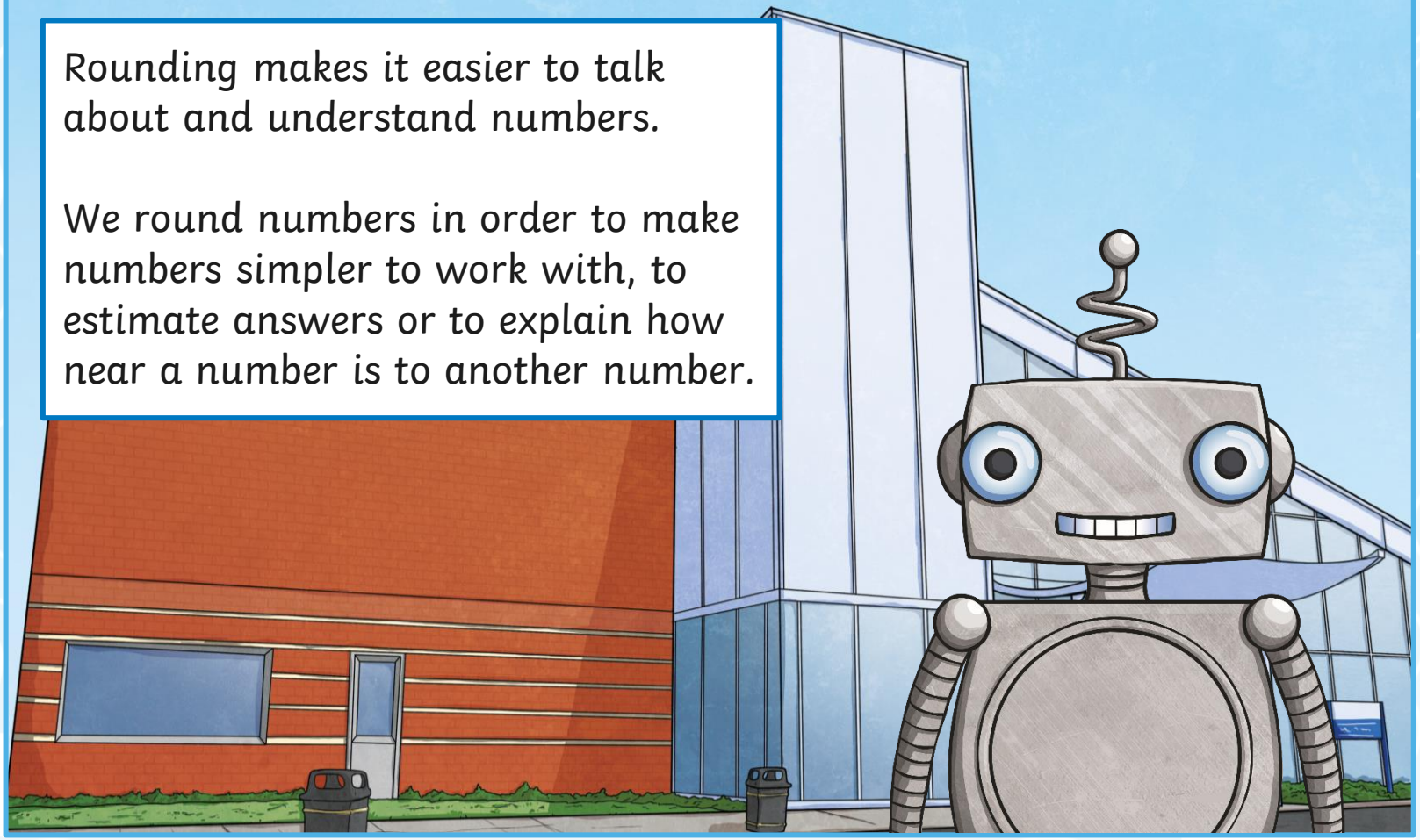
1. 275 ☐ = 2.75
2. 3 693 ☐ = 3 693 000
3. 732 ☐ = 7 320
4. 921 093 ☐ = 92 109.3
5. 3 500 ☐ = 3.5
6. 216 ☐ = 21 600



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.

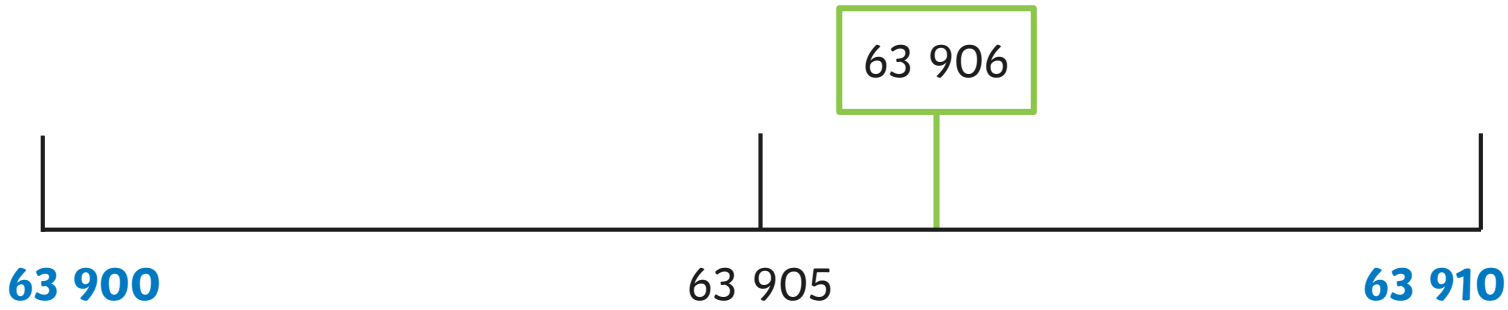
The rule for identifying which digit to consider is to look at the digit in the place before the value we are rounding to.

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**.

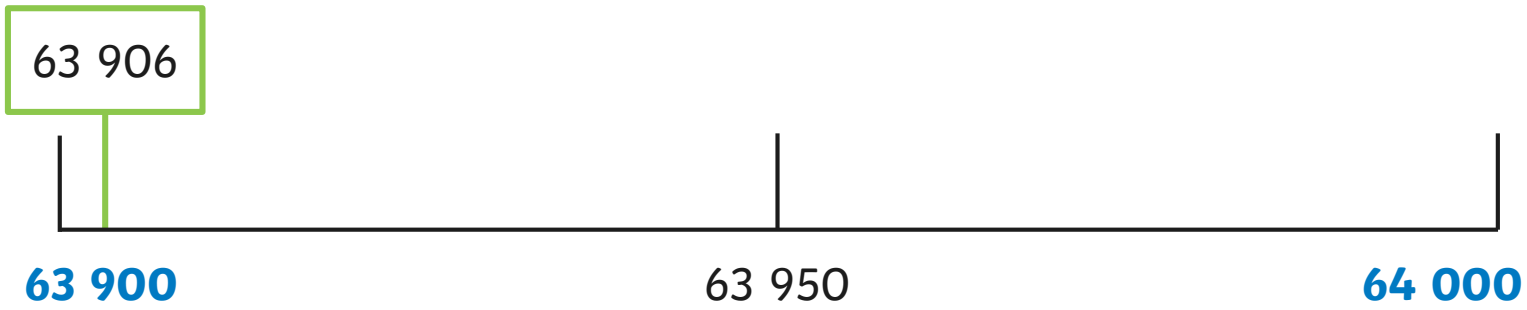


Finding the midpoint helps to position the number on the number line.

Rounding Accurately

Now, we can try rounding 63 906 to the nearest 100.

The number is closer to 63 900 than 64 000. In this case, 63 906 rounds down to 63 900 when rounding to the nearest **100**.

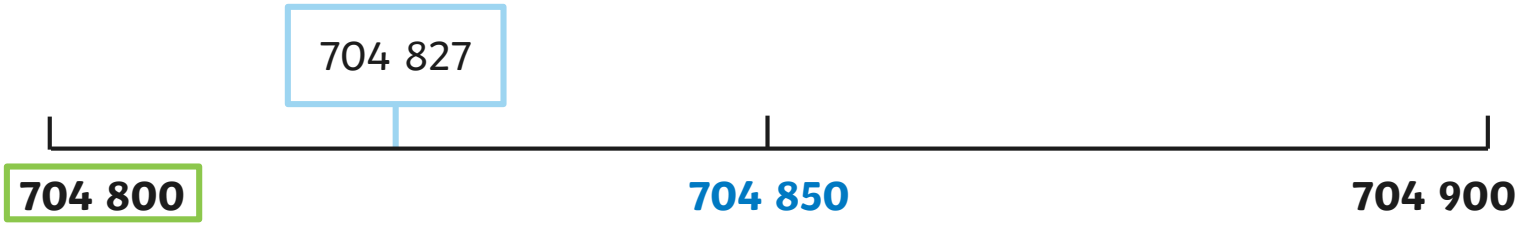


Finding the midpoint helps to position the number on the number line.

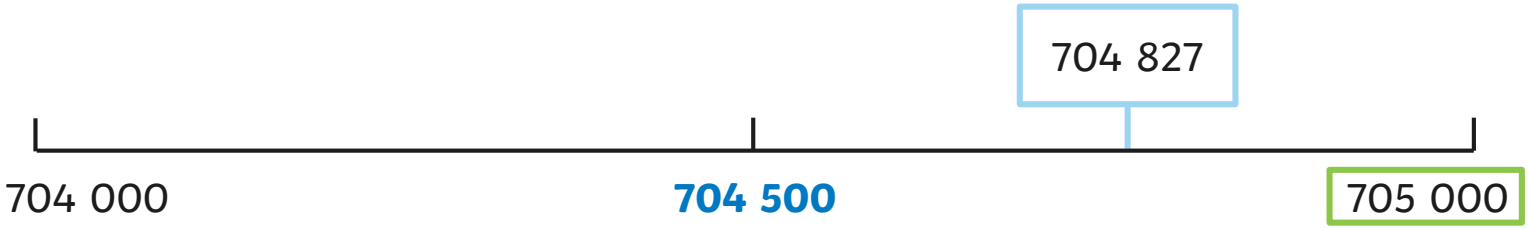
Rounding Accurately

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



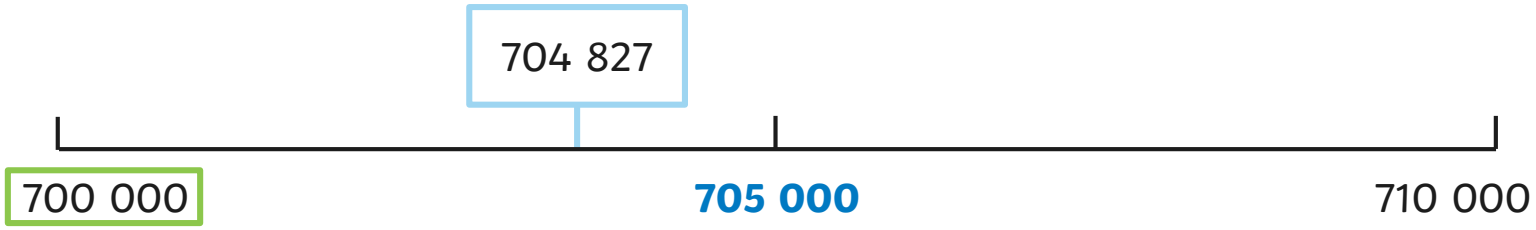
Rounded to the nearest 1 000



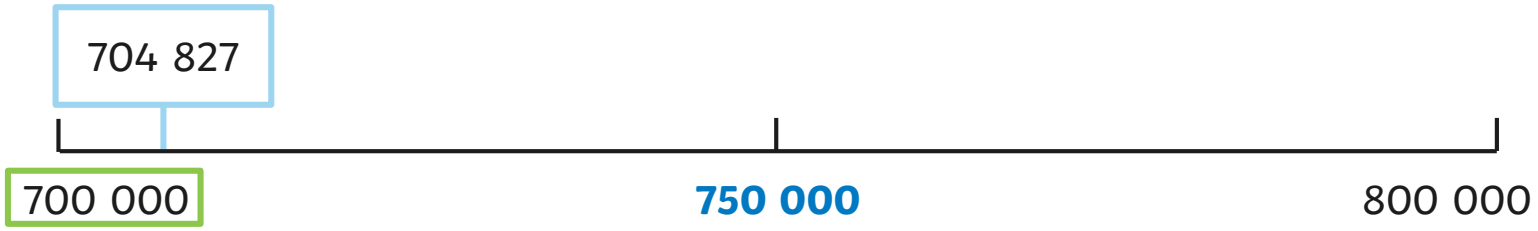
Rounding Accurately

The same method works when rounding larger numbers.
What is **704 827** is rounded to the nearest 100, 1 000, 10 000 and 100 000?

Rounded to the nearest 10 000



Rounded to the nearest 100 000



Rounding Accurately

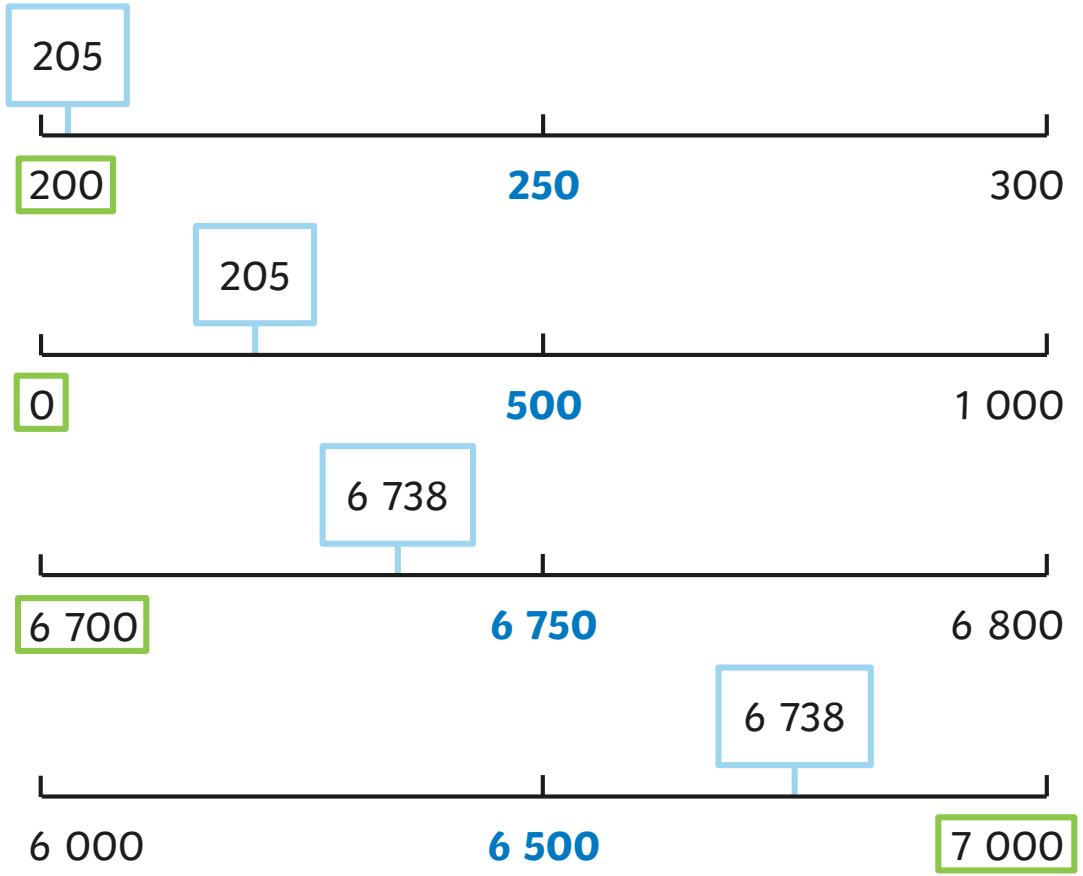
Choose a section and try rounding these numbers.
Blank number lines might be helpful.

★ 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

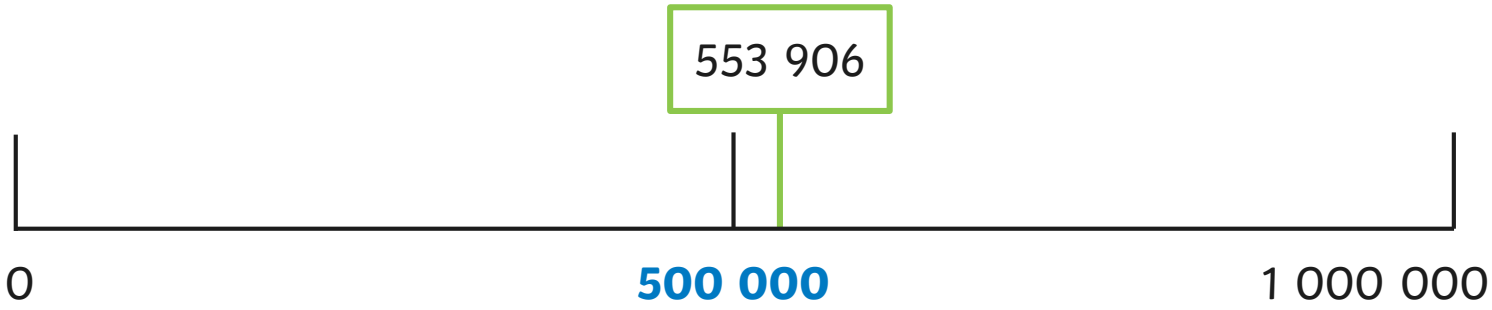
Let's check to see how you got on.

★★★ 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

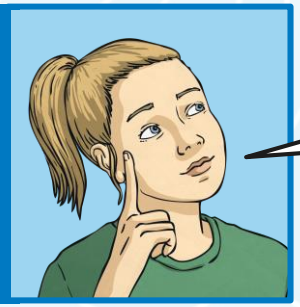
We follow the same steps to round to the nearest 1 000 000.
What is 553 906 rounded to the nearest 1 000 000?

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.

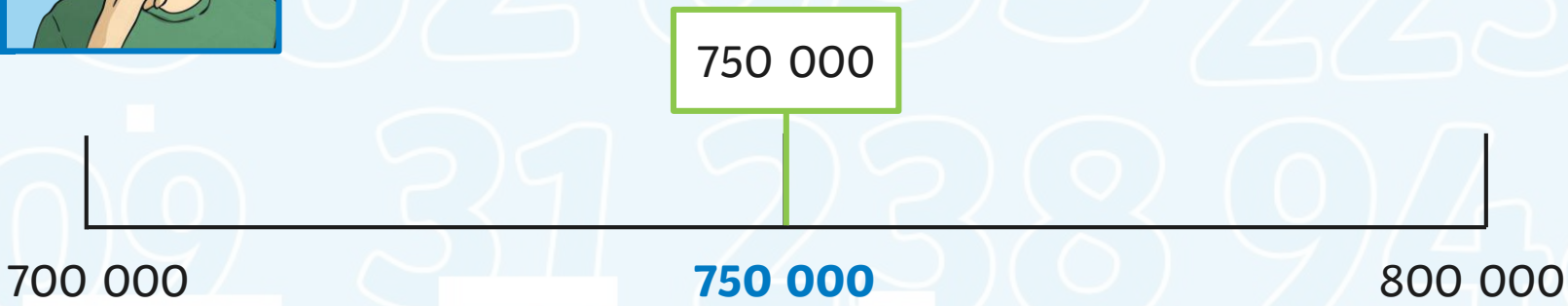


Rounding Accurately

Do you agree with Abigail? **Discuss with a partner.**



If a number sits on the midpoint, it has already been rounded.



Abigail is incorrect. In this example, 750 000 is rounded to the nearest 100 000.

Although 750 000 is equidistant from 700 000 and 800 000, numbers in this case are rounded up to the nearest 100 000. 750 000 to the nearest 100 000 is 800 000.

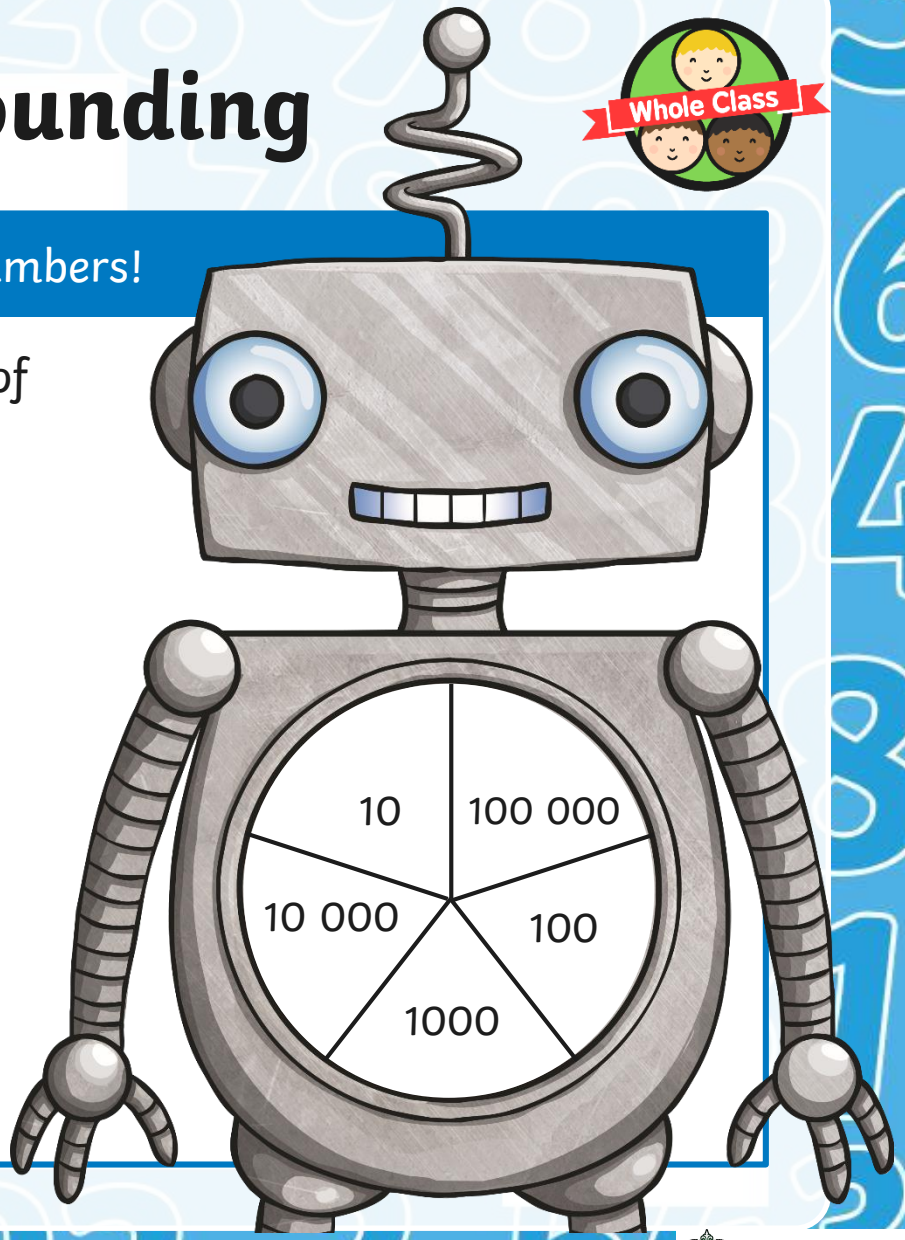
Robot Rounding

Whole Class

These robots are designed to round numbers!

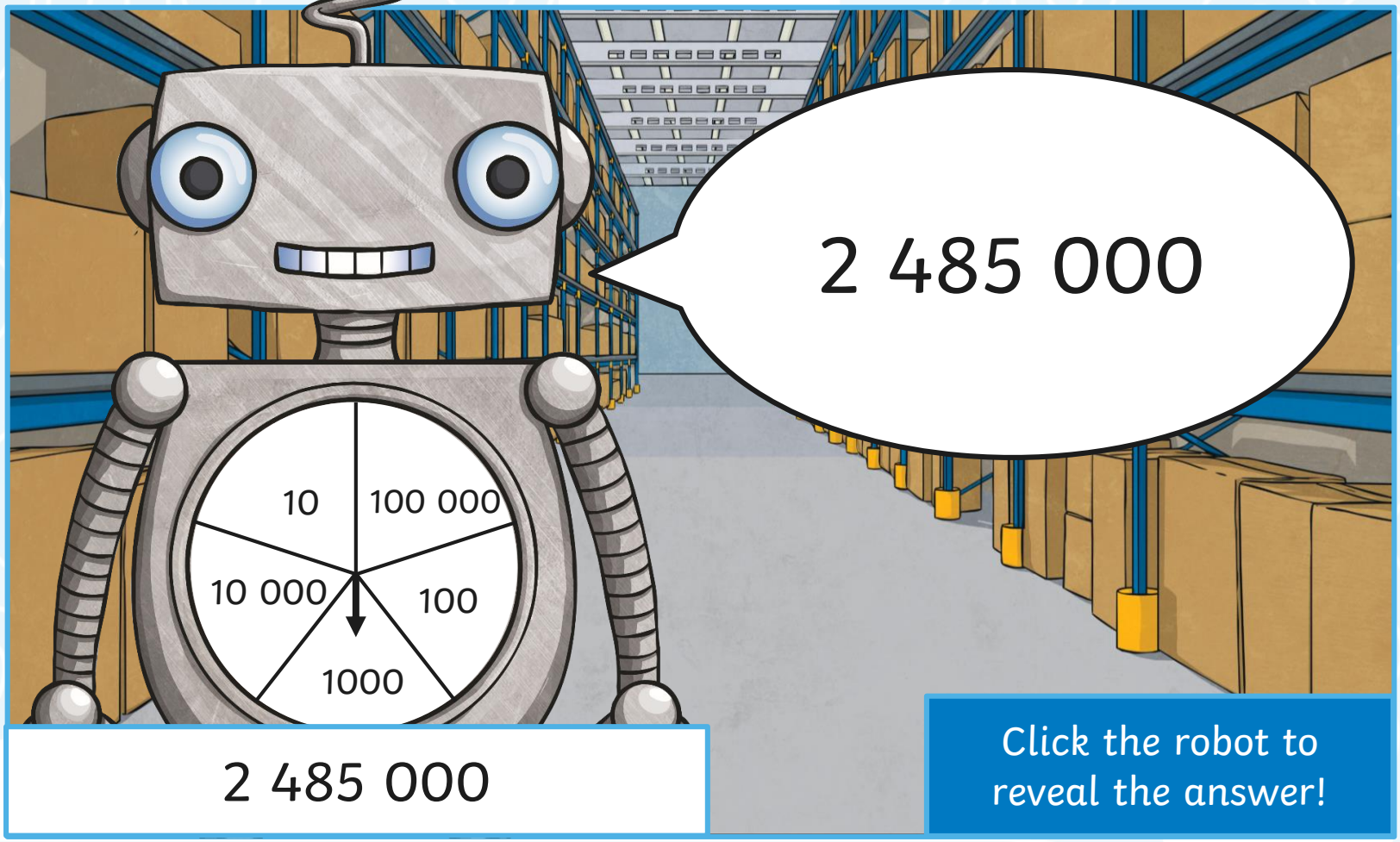
The dial on the front sets the degree of accuracy. The robot takes a number and rounds it to the correct degree.

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



Robot Rounding

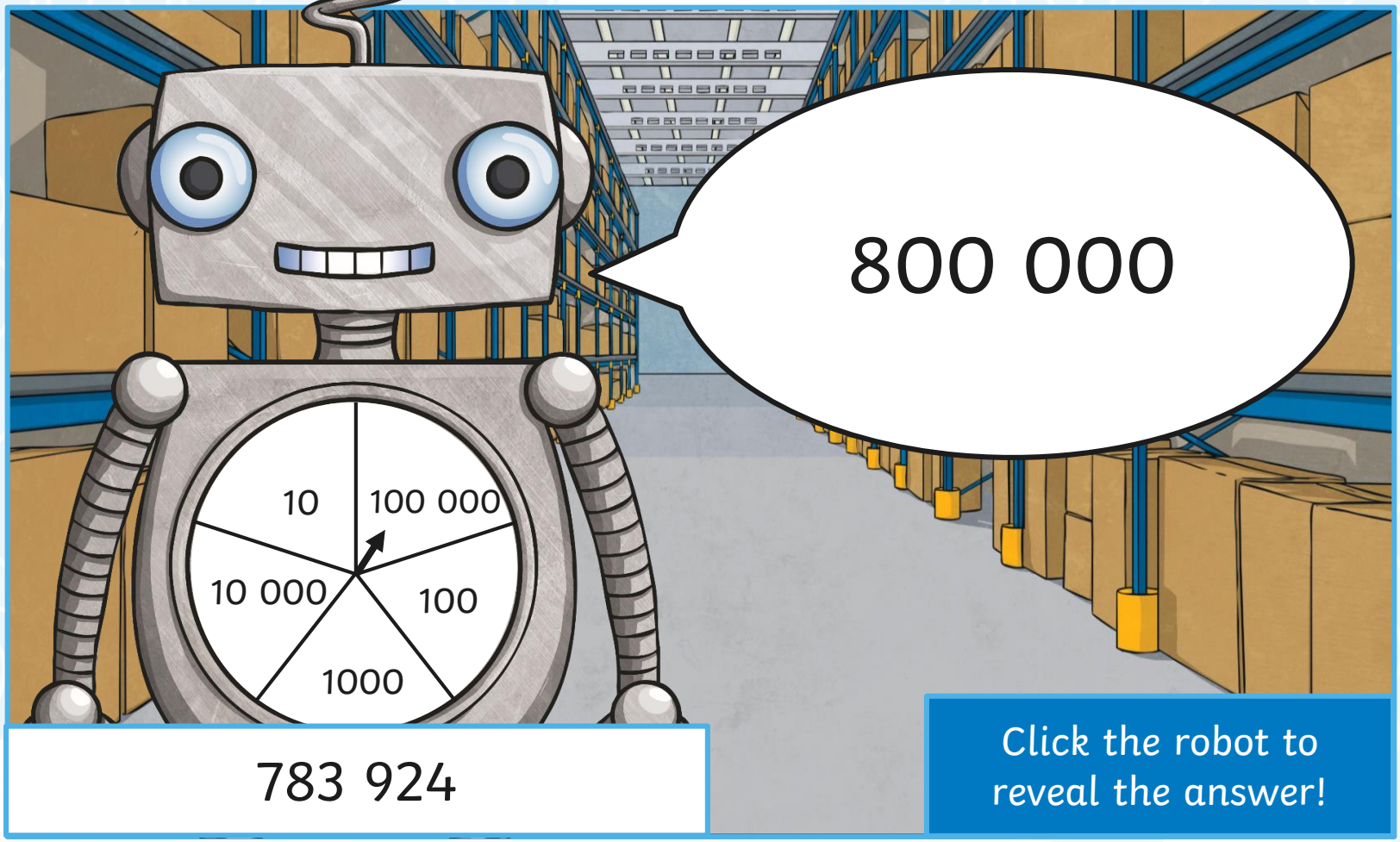
Whole Class



2 485 000

Click the robot to reveal the answer!

Robot Rounding

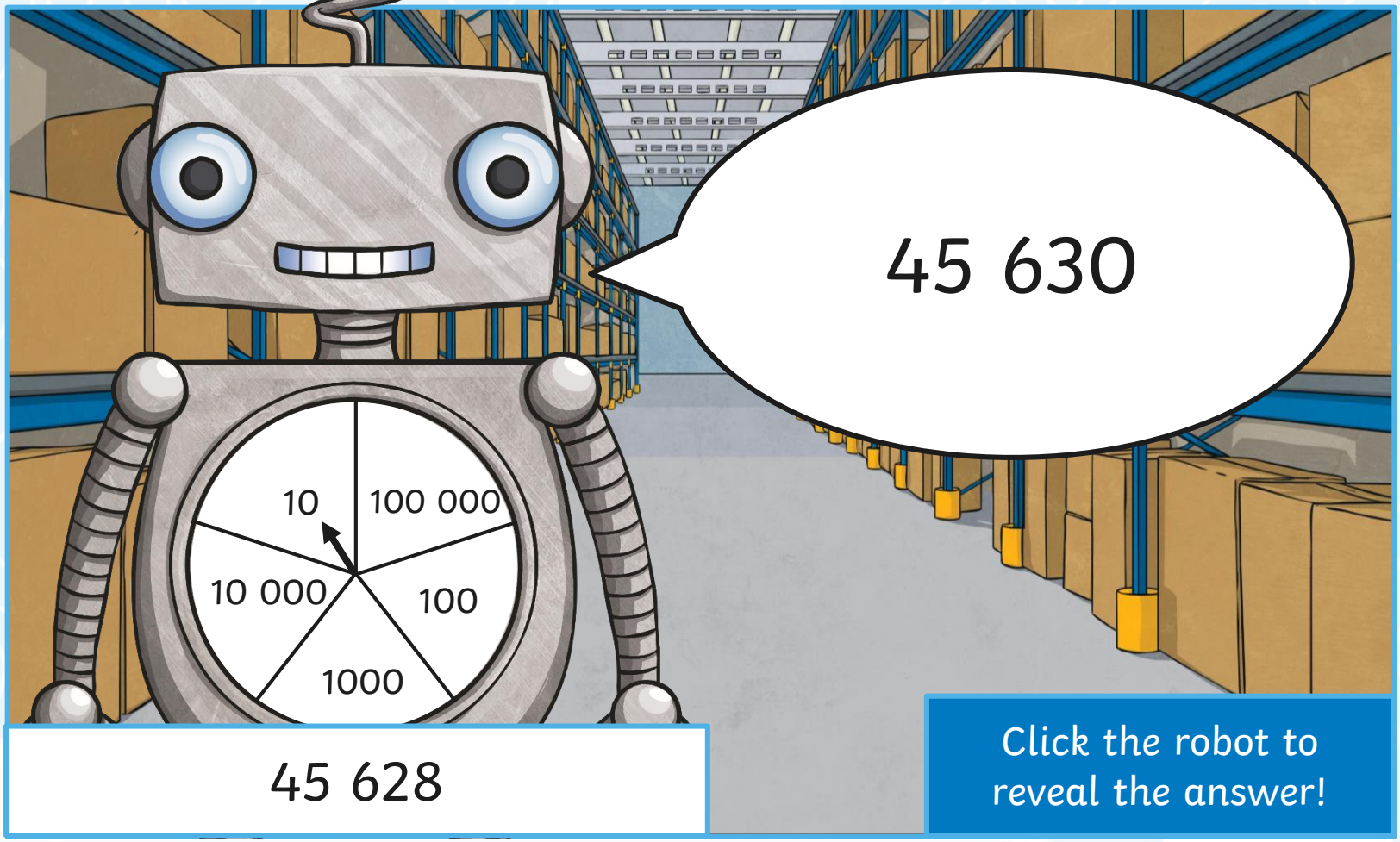


783 924

Click the robot to reveal the answer!

Robot Rounding

Whole Class



45 628

Click the robot to reveal the answer!

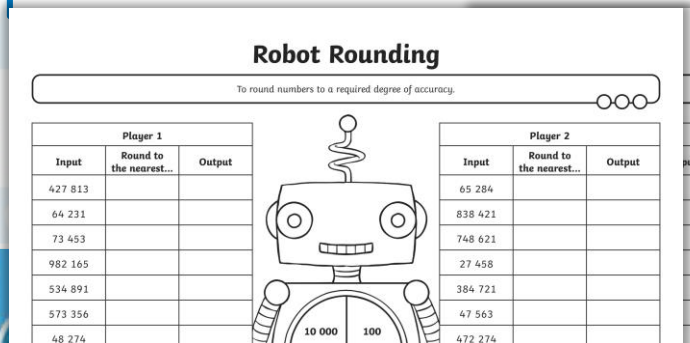
Robot Rounding Activity

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.

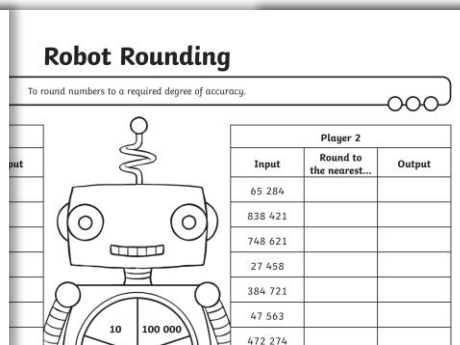

Robot Rounding

To round numbers to a required degree of accuracy.

Player 1		
Input	Round to the nearest...	Output
427 813		
64 231		
73 453		
982 165		
534 891		
573 356		
48 274		

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

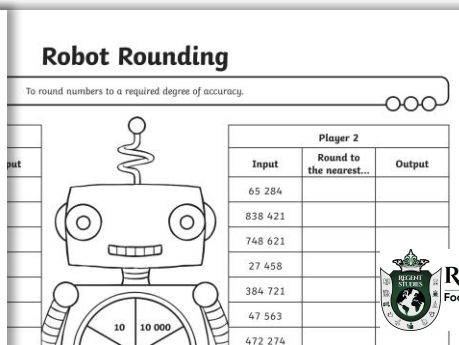
10 000 100


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		

10 100 000


Robot Rounding

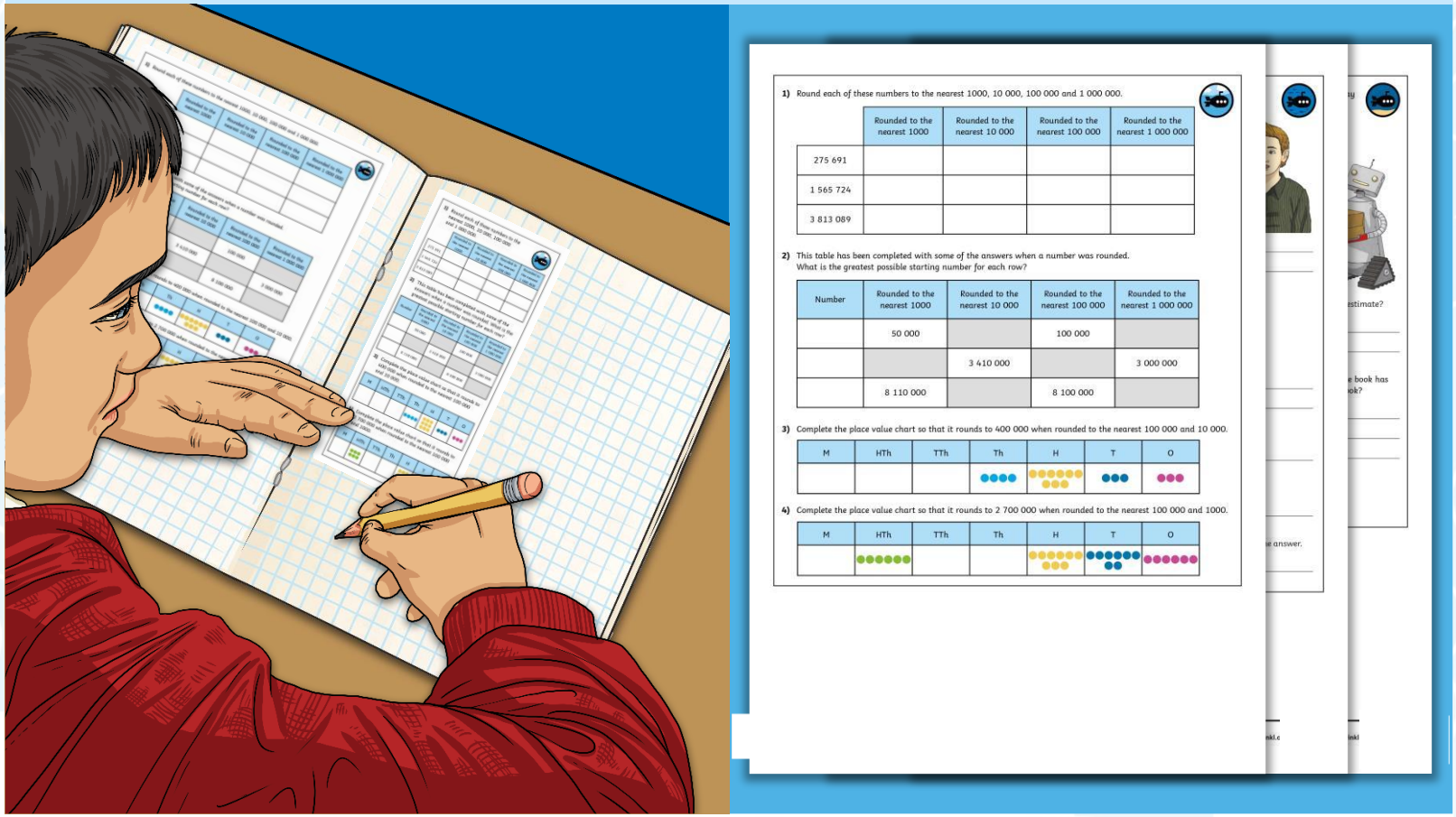
To round numbers to a required degree of accuracy.

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

10 10 000

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.

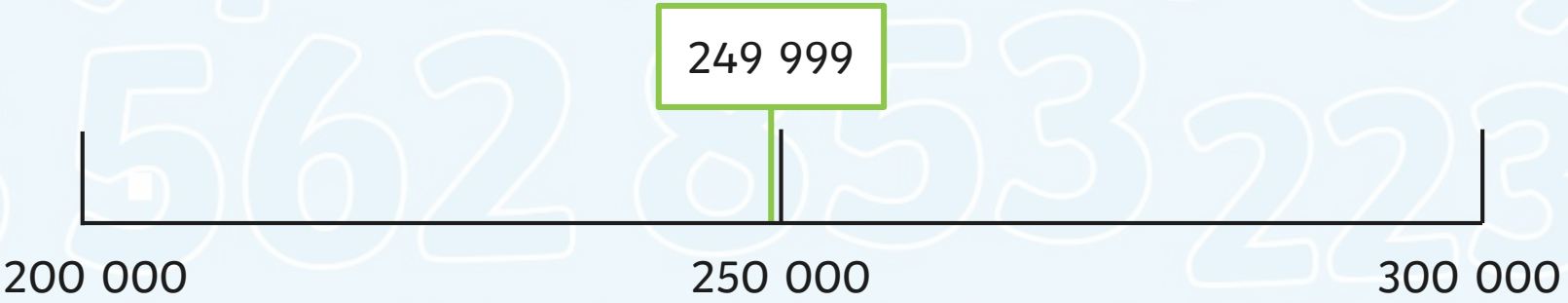
M	HTh	TTh	Th	H	T	O
			●●●●	●●●●●● ●●●	●●●	●●●

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

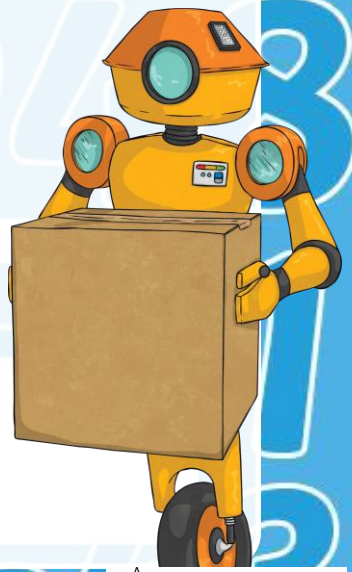
M	HTh	TTh	Th	H	T	O
	●●●●●●			●●●●●● ●●●	●●●●●● ●	●●●●●●

Rounding and Reasoning

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



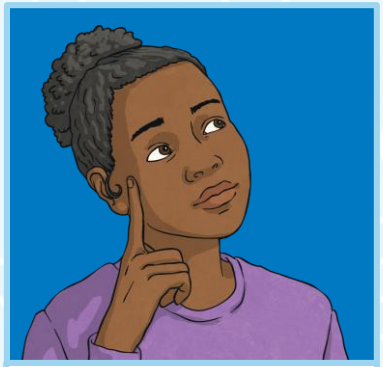
200 000	249 999	349 999



Rounding and Reasoning

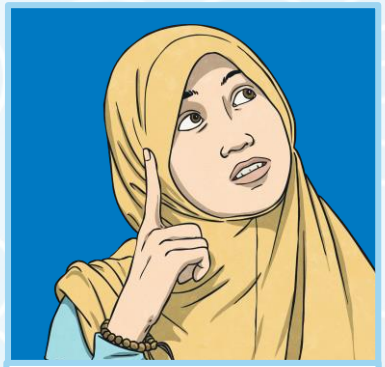
Three children have rounded 390 908 to the nearest 10 000.

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



390 900

390 000



400 000

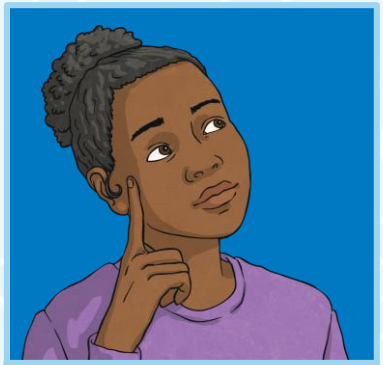
Can you explain the mistakes the other children have made?

Rounding and Reasoning

Whole Class

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.**

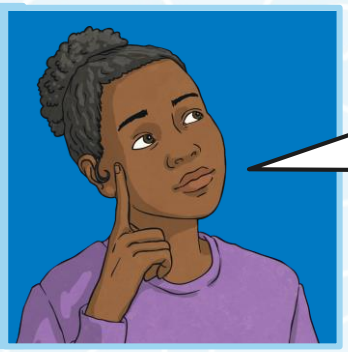
My number is less than one million, but when rounded to the nearest 10, 100, 1 000, 10 000 and 100 000, **is** one million.

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

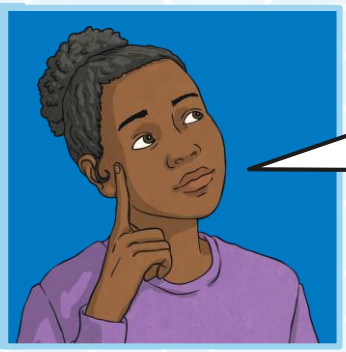
With a partner, prove Mercia's statement to be incorrect.
Use a number line to help justify your reasoning.



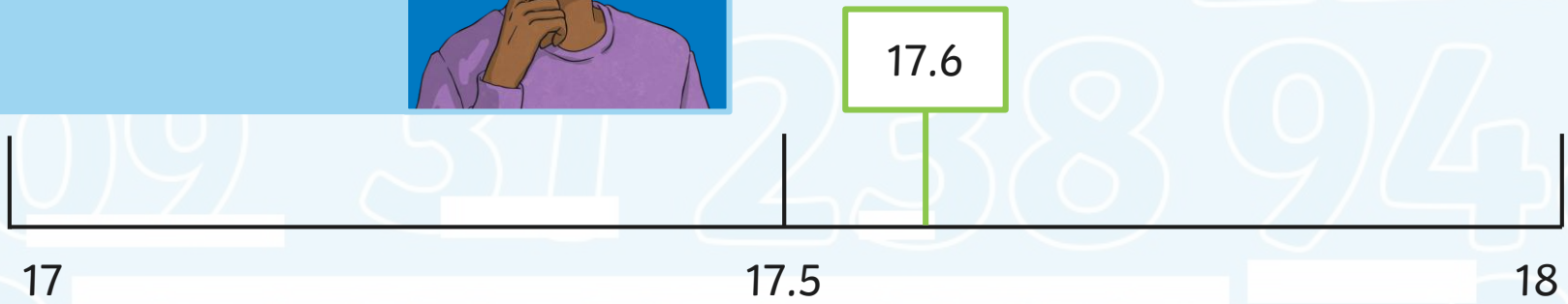
It is impossible to round numbers with decimals because you cannot find a midpoint on a number line.

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.