

## Year 6 Autumn 1

### Unit 1: Place Value

**Lesson 5:** Round any number up to 10,000,000 to the nearest 10, 100, 1,000, 10,000, 100,000 or 1,000,000

#### Lesson Objectives:

Round whole numbers up to 10,000,000 in different ways.

#### Lesson Focus:

Children will extend their understanding of rounding whole numbers, identifying which multiple of any power of 10 any given number up to 10,000,000 is close to. The children will continue to identify the midpoint between any two adjacent multiples of powers of 10 before placing the number to be rounded either below or above this midpoint in order to round it accurately. The children will begin by using a number line and should continue to imagine it when working with only abstract numerals.

#### Starter (No more than 10 minutes)

Manipulate the whole and one of the parts in a subtraction equation to make the calculation more efficient.

Show page 1 of the SMART Notebook file.

- What two numbers can we put on the number line to help solve the calculation?

10,000 at the right-hand end and 3,456 at the other mark.

- What is the whole line worth? 10,000

- How can you show that 3,456 is being subtracted from or taken out of the 10,000? Cross out the part of the line from 0 to 3,456 as this is worth 3,456

- How can you work out what this part of the line is worth: the difference between 3,456 and 10,000?

Count on from 3,456 to 10,000

- Do this on your whiteboards.

Share answers and agree that the difference is 6,544 and model it on the slide as shown here:

Show page 2 with the same calculation at the top alongside  $9,999 - 3,455$

- What is the whole on the left of the equals sign? 10,000

- Where should it be written in the model below?

In the 'whole' circle at the top. Write this in.

- What is the part on the left of the equals sign and where should it be written in the model below? 3,456 in either of the parts circles.

- What has happened to the whole and part on the left to give the whole and part on the right of the equals sign? Both have been reduced by 1

- So if the whole and the part taken have been reduced by 1 what will happen to the part left?

It will stay the same. If children do not understand this, quickly demonstrate with  $8 - 2 = 6$  and  $7 - 1 = 6$  in which the whole and part taken have both been decreased by 1 so the part left is the same.

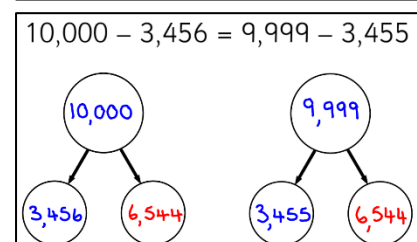
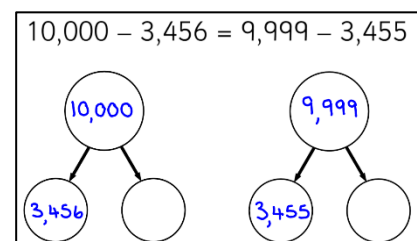
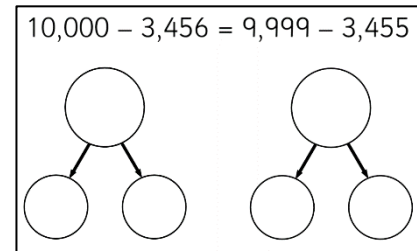
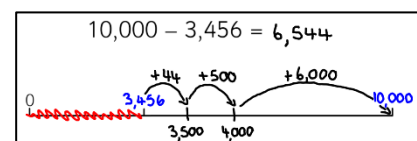
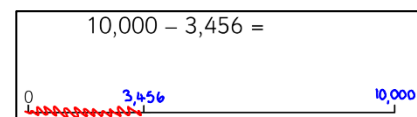
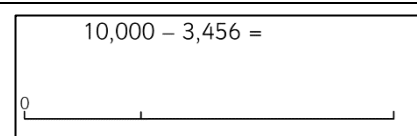
Write the whole and part in the model on the right as shown.

- What makes  $9,999 - 3,455$  simple? There are no exchanges between columns.

- What is  $9,999 - 3,455$ ? Show me on your whiteboards. 6,544

- So what is the answer to  $10,000 - 3,456$ ? Also 6,544

Ask children to change the calculations on pages 3 and 4 to make

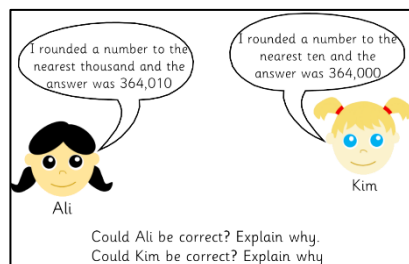


equivalent calculations that are easier to solve.

With  $6,412 - 2,983$  both numbers should be increased by 17 to create  $6,429 - 3,000 = 3,429$

With  $7,064 - 502$  both numbers should be decreased by 2 to create  $7,062 - 500 = 6,562$

### Initial Problem



Ali

Kim

Could Ali be correct? Explain why.  
Could Kim be correct? Explain why

Show page 5 of the SMART Notebook file with the initial problem. Read through the prompts and questions. Children to work in pairs to discuss the question.

#### Scaffold

When rounding to the nearest thousand what do you know about the answer? It must be a multiple of 1,000

How do you know whether a number is a multiple of 1,000? It is a whole number with 0 in the ones, tens and hundreds places.

#### Extension

What else could the 'rounding rule' be to get an answer of 364,000? Rounding to the nearest: thousand, hundred, ten, one.

Take feedback of children's responses. Guided Learning will begin with modelling these statements.

### Misconception / lack of fluency

Children may think that a number rounded to the nearest 10 cannot be a multiple of 100 or 1,000 as in the case of Kim. The children may need reminding that 100 and 1,000 are multiples of 10, so rounding to the nearest 10 can result in answers that are also multiples of 100 or 1,000 (or other greater powers of 10).

### Guided Learning

Show page 6 of the SMART Notebook file and ask:

- *When rounding to the nearest thousand, what could the possible answers be?*

Share ideas and generalise that all the answers must be multiples of 1,000

- *Is 364,010 a multiple of 1,000? How do you know?*

No it is not because multiples of 1,000 are whole numbers with 0 in the ones, tens and hundreds places.

- *What multiples of 1,000 does 364,010 lie between? Where should these be written on this number line? At each end with 364,000 on the left and 365,000 on the right. Write these on the page.*

- *What is the midpoint of these numbers? 364,500 Write this on the page.*

- *Where would 364,010 fit on the number line? Just after 364,000 Show with an arrow on the page*

- *What does 364,010 round to, to the nearest 1,000? 364,010 rounds to 364,000*

Repeat with the next page using Kim's statement, and agreeing that the answer is possible.

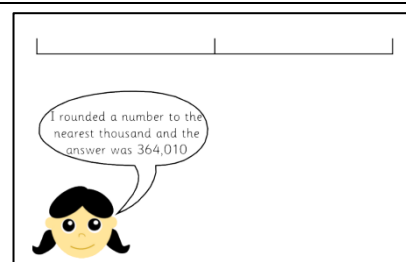
Show page 8.

- *What does the sentence say at the bottom? Read it together, ensuring the number is read accurately.*

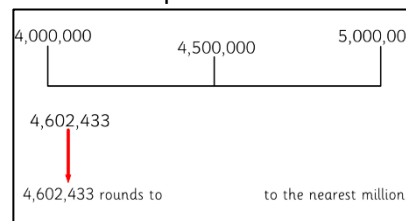
- *What numbers are on the number line? 4,000,000 on the left, 5,000,000 on the right and 4,500,000 is the midpoint.*

- *Where does this number fit in relation to the midpoint? Just to the right of 4,500,000 Move the number with the arrow into the correct place on the line.*

- *What does 4,602,433 round to, to the nearest million? 4,602,433 rounds to 5,000,000 to the nearest million. Complete the sentence at the bottom and say it together.*



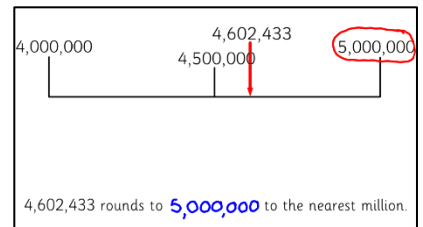
I rounded a number to the nearest thousand and the answer was 364,010



The image on the right shows the completed modelling.

Show page 9 and ask children to show how they would round 6,466,210 to the nearest million on their whiteboards. Share answers and model as before on the page.

Repeat with page 10, rounding to the nearest million but with scaffold being removed.



Repeat with pages 11 and 12, rounding to the nearest 10,000 with some scaffold initially and then no scaffold.

Repeat with pages 13 and 14 that allow children to practise rounding to the nearest 1,000

Show page 15 and write 0 on the left of the top line and 10 on the right.

- *What is the midpoint of this line?* The midpoint between 0 and 10 is 5

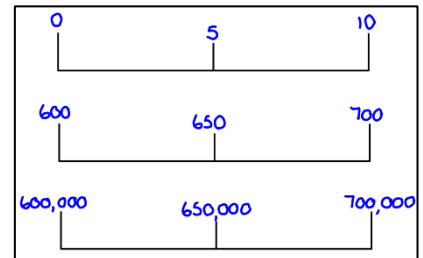
Write 600 on the left of the second line and 700 on the right.

- *What is the midpoint of this line?* The midpoint between 600 and 700 is 650

Write 600,000 on the left of the last number line and 700,000 on the right.

- *What is the midpoint of this line?* The midpoint between 600,000 and 700,000 is 650,000

- *What do you notice about the midpoint between all of these number lines?*



They all have a 5 in them. Apart from the top line, the digit 5 is added into the first number in the next most significant place.

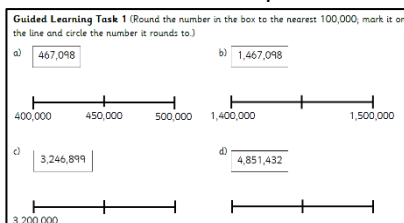
- *How can this help us to round numbers?*

Say together:

**Round down if the number is less than halfway between the two multiples.**

**Round up if the number is halfway or greater between the two multiples.**

Ask children to complete **Guided Learning Task 1** (mark the number and circle what it rounds to).



Circulate and support as necessary.

Extension:

- *How many whole numbers would round to 5,000,000 to the nearest million? Hint, what is the smallest and greatest 7-digit numbers that round to 5,000,000 to the nearest million.*

Show slide 17 and ask:

- *What would this number round to, to the nearest 100,000?*

Show me on your whiteboards.

Share ideas and agree that it rounds to 4,900,000

- *What are the multiples of 100,000 either side of this number?*

4,800,000 and 4,900,000 Write these on the slide.

- *What is the midpoint between these?* 4,850,000

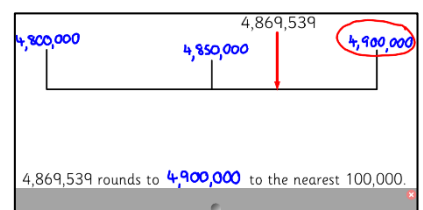
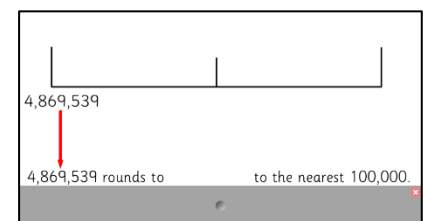
Write this on the slide.

- *Where does 4,869,539 fit relative to this midpoint so what does it round to?*

4,869,539 is more greater than the midpoint so rounds up to

4,900,000

Move the arrow and number to show this and complete the sentence.



Remove the screen shade to reveal the number in place value columns.

- How could you use the place value columns to help you round this number?

Discuss in pairs before sharing answers as a class.

- What are we being asked to round to the nearest? 100,000
- Where is this column? Indicate it on the page.
- What are the two possible options? 4,800,000 and 4,900,000
- Which digits of the answer can we write in? 4, \_\_00,000

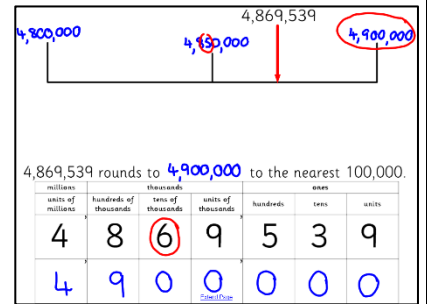
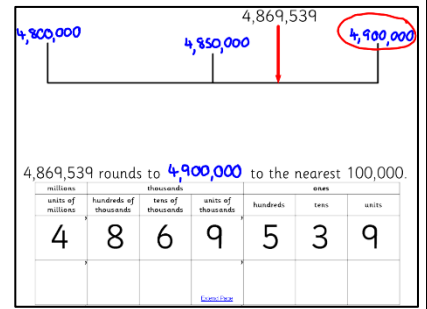
Write these in the columns.

- What digit do you look at to decide whether it rounds up or down?

The digit to the right which represents 60,000

- Is 60,000 less or more than the midpoint of 50,000? It is more so it rounds up.

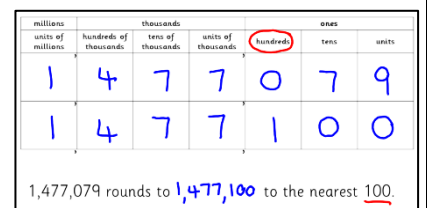
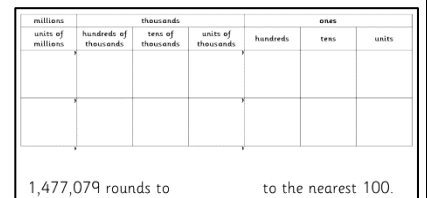
Complete the place value columns showing what 4,869,539 rounds to.



Show page 18 and ask children to use their place value columns to illustrate how they would round 1,477,079 to the nearest 100

Share ideas, then model on the page:

- write the number in the first row
- highlight the column used to indicate the rounding (hundreds)
- identify the two possible options verbally
- look at the digit to the right of the highlighted column and see if this is less or more than the midpoint between the two possible options.



Repeat for pages 19 and 20.

Say together:

**Round down if the number is less than halfway between the two multiples.**

**Round up if the number is halfway or greater between the two multiples.**

**Guided Learning Task 2** (Round the number in the box to the nearest 10,000, mark it on the line and circle the number it rounds to.)

e)       f)

g) 2,431,665 rounded to the nearest 1,000 is: \_\_\_\_\_

h) 6,728,007 rounded to the nearest 1,000 is: \_\_\_\_\_

i) 2,431,665 rounded to the nearest 10 is: \_\_\_\_\_

j) 6,728,007 rounded to the nearest 10 is: \_\_\_\_\_

Ask children to complete **Guided Learning Task 2** (mark the number and circle what it rounds to). Circulate and support as necessary.

## Independent Learning

**Independent Learning Tasks**

k) Round 7,784,228 to the nearest 100,000. \_\_\_\_\_

l) Round 4,187,400 to the nearest 10,000. \_\_\_\_\_

m)  rounded to the nearest 100,000 is       n)  rounded to the nearest 10,000 is

o) Round 3,516,279 to the nearest million.

p) The table shows the total attendance figures for 3 football stadiums.

Stadium	Total attendance	Total attendance rounded to nearest ten thousand
Derby Stadium	4,703,312	
Angel Stadium	3,016,142	
Fenny Park	2,455,434	

q) A newspaper reported:  
 \* million people (to the nearest million) watched a football match on television.  
 \* What is the smallest number of people that could have watched the football match on television?

r) Write the number that is nearest to 2,000,000 which uses all the digits 1, 2, 3, 4, 5, 6 and 7.

The first two questions replicate the Guided Tasks but with less scaffold provided.

Questions m to o are more abstract without the scaffold of a number line, however, children could sketch one for support if necessary.

Question p asks children to round the three numbers in context to a given degree of accuracy

In question q, the children need to use their thinking in reverse, where the rounded number has been given but they need to identify the smallest number that could be rounded this way.

In question r, the children need to rearrange the digits to find the number

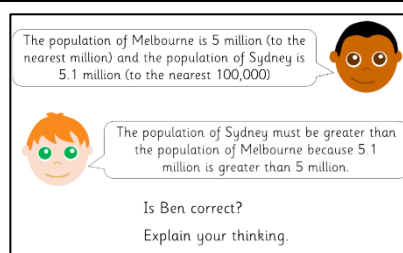
that is closest to 2,000,000. This reminds children that rounding is about how close a number is to either of two adjacent multiples of powers of ten.

### Deeper Learning

When tackling this problem, children need to identify that the population of Melbourne is any number in the range of 4,500,000 to 5,499,999.

They also need to recognise that the population of Sydney shown as 5.1 million is the same as 5,100,000 when rounded to the nearest 100,000. Therefore, the population of Sydney is any number in the range 5,050,000 to 5,149,999.

Therefore, it is possible for the population of Sydney to be 5,050,000 and the population of Melbourne to be 5,499,999 so Ben is incorrect. There is a possibility that the population of Sydney could be more than that of Melbourne but Ben's reasoning is not accurate.



The population of Melbourne is 5 million (to the nearest million) and the population of Sydney is 5.1 million (to the nearest 100,000)

The population of Sydney must be greater than the population of Melbourne because 5.1 million is greater than 5 million.

Is Ben correct?  
Explain your thinking.

### Key Outcomes

Children can round numbers to 10,000,000 to the nearest 10, 100, 1,000, 10,000, 100,000 and million.  
Children know to round down if the number is less than halfway between the two multiples.  
Round up if the number is halfway or greater between the two multiples.

### Resources

Whiteboards and pens

Place value charts.

Children's task sheets copied (one per child)