Autumn
Scheme of learning
Year 5

White Rose Maths

#MathsEveryoneCan

The **White Rose Maths** schemes of learning

Teaching for mastery

Our research-based schemes of learning are designed to support a mastery approach to teaching and learning and are consistent with the aims and objectives of the National Curriculum.

Putting number first

Our schemes have number at their heart.
A significant amount of time is spent reinforcing number in order to build competency and ensure children can confidently access the rest of the curriculum.

Depth before breadth

Our easy-to-follow schemes support teachers to stay within the required key stage so that children acquire depth of knowledge in each topic. Opportunities to revisit previously learned skills are built into later blocks.

Working together

Children can progress through the schemes as a whole group, encouraging students of all abilities to support each other in their learning.

Fluency, reasoning and problem solving

Our schemes develop all three key areas of the National Curriculum, giving children the knowledge and skills they need to become confident mathematicians.

Concrete – Pictorial – Abstract (CPA)

Research shows that all children, when introduced to a new concept, should have the opportunity to build competency by following the CPA approach. This features throughout our schemes of learning.

Concrete

Children should have the opportunity to work with physical objects/concrete resources, in order to bring the maths to life and to build understanding of what they are doing.

Pictorial

Alongside concrete resources, children should work with pictorial representations, making links to the concrete.
Visualising a problem in this way can help children to reason and to solve problems.

Abstract

With the support of both the concrete and pictorial representations, children can develop their understanding of abstract methods.

$$5 + 7$$

If you have questions about this approach and would like to consider appropriate CPD, please visit www.whiterosemaths.com to find a course that's right for you.

Teacher guidance

Every block in our schemes of learning is broken down into manageable small steps, and we provide comprehensive teacher guidance for each one. Here are the features included in each step.

Notes and guidance that provide an overview of the content of the step and ideas for teaching, along with advice on progression and where a topic fits within the curriculum.

Things to look out for, which highlights common mistakes, misconceptions and areas that may require additional support.

Year 5 | Autumn Term | Block 1 – Place Value | Step 1

Roman numerals to 1,000

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Notes and guidance

In Year 4, children learned about Roman numerals to 100. In this small step, they explore Roman numerals to 1,000, and the symbols D (500) and M (1,000) are introduced.

Children explore further the similarities and differences between the Roman number system and our number system, learning that the Roman system does not have a zero and does not use placeholders.

Children use their knowledge of M and D to recognise years using Roman numerals. Asking children to write the date in Roman numerals is one way to reinforce the concept daily.

Key questions

- What patterns can you see in the Roman number system?
- What rules do we use when converting numbers to Roman numerals?
- What letters are used in the Roman number system? What does each letter represent?
- How do you know what order to write the letters when using Roman numerals?
- What is the same and what is different about representing the number "five hundred and three" in the Roman number system and in our number system?

Things to look out for

- Children may mix up which letter stands for which number.
- Children may add the individual values together instead of interpreting the values based on their position, for example interpreting CD as 600 instead of 400
- It is often more difficult to convert numbers that require large strings of Roman numerals.
- Children may think that numbers such as 990 can be written as XM instead of CMXC.

Possible sentence stems

- The letter _____ represents the number _____
- I know _____ is greater than _____ because _____

National Curriculum links

- Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals

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Key questions that can be posed to children to develop their mathematical vocabulary and reasoning skills, digging deeper into the content.

Possible sentence stems to further support children's mathematical language and to develop their reasoning skills.

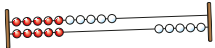**National Curriculum links** to indicate the objective(s) being addressed by the step.
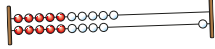
Teacher guidance

A **Key learning** section, which provides plenty of exemplar questions that can be used when teaching the topic.

Reasoning and problem-solving activities and questions that can be used in class to provide further challenge and to encourage deeper understanding of each topic.

Year 2 | Autumn Term | Block 1 – Place Value | Step 1

Numbers to 20

Key learning

- Complete the number tracks.
- What numbers are shown?

  Give your answers in numerals and words.
- What number is shown on each Rekenrek?

  Give your answers in numerals and words.
- What numbers are shown?

  Give your answers in numerals and words.
- Use words to complete the sentences.

  The number after four is ——
  The number before eight is ——
  The number after nine is ——

Make each number in three different ways.

19   fifteen   16   eleven

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Year 3 | Autumn Term | Block 1 – Place Value | Step 4

Hundreds

Reasoning and problem solving

I am going to count in 100s from zero.

Dora

Write two numbers that Dora will say.

any two multiples of 100

Dora will say the number 160

Tiny

Is Tiny correct?
How do you know?

No

Mo is counting in hundreds.

... 8 hundred, 9 hundred, 10 hundred

How should Mo have said the last number?

Mo should have said 1 thousand. 10 hundreds is equal to 1 thousand.

Balloons come in bags of 10
Rosie has 300 balloons.

How many bags does she have?

Rosie has 30 bags of balloons.

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Activity symbols that indicate an idea can be explored practically

Answers provided where appropriate

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Activities and symbols

Key Stage 1 activities

Key Stage 1 includes more hands-on activities alongside questions.

An activity to be led by the teacher
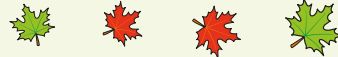
Use a Rekenrek in the ready position.

Ask children to show a number on their Rekenrek.

An outside activity or one that uses resources from nature

Find some seeds and leaves to represent Autumn.

Ask children to sort the objects in three different ways and then compare their answers with a partner.

An activity introduced by a reading from an appropriate fiction or non-fiction book

Read *The Button Box* by M Reid.

Give children a selection of buttons and ask them to sort the buttons in as many different ways as they can.

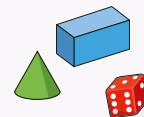Encourage them to think about size, shape, colour and number of holes.

An investigation

Give children a selection of 3D shapes.

Ask children to sort the objects into two groups and then challenge a partner to say how the objects have been sorted.

Key Stage 1 and 2 symbols

The following symbols are used to indicate:

concrete resources might be useful to help answer the question

a bar model might be useful to help answer the question

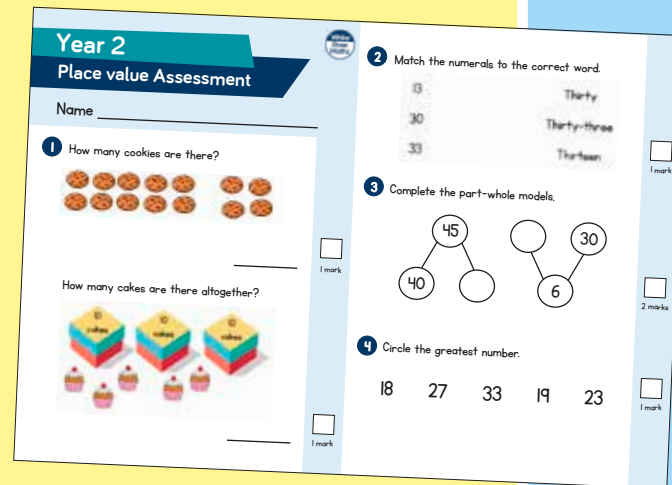drawing a picture might help children to answer the question

children talk about and compare their answers and reasoning

a question that should really make children think. The question may be structured differently or require a different approach from others and/or tease out common misconceptions.

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Free supporting materials

End-of-block assessments to check progress and identify gaps in knowledge and understanding.
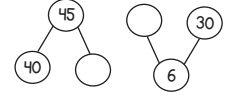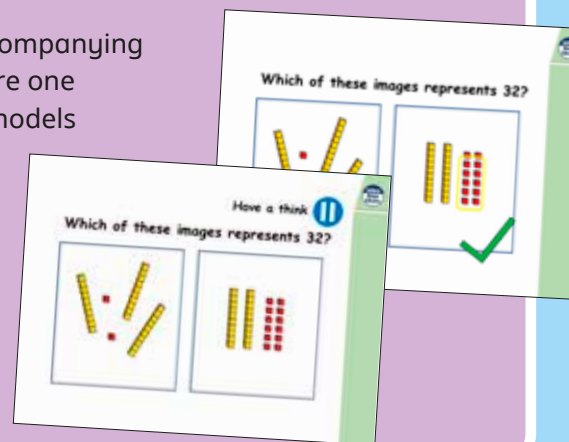
Each small step has an accompanying **home learning video** where one of our team of specialists models the learning in the step. These can also be used to support students who are absent or who need to catch up content from earlier blocks or years.

End-of-term assessments for a more summative view of where children are succeeding and where they may need more support.

Free supporting materials

National Curriculum progression to indicate how the schemes of learning fit into the wider picture and how learning progresses within and between year groups.

Calculation policies that show how key approaches develop from Year 1 to Year 6.

Ready to progress mapping that shows how the schemes of learning link to curriculum prioritisation.

Premium supporting materials

Worksheets to accompany every small step, providing relevant practice questions for each topic that will reinforce learning at every stage.
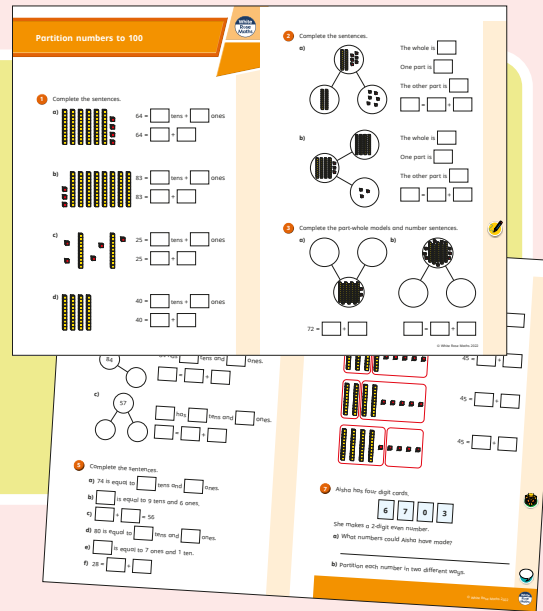
Display versions of the worksheet questions for front of class/whole class teaching.

Place value

Autumn Term Block 1

Also available as printed **workbooks**, per block.
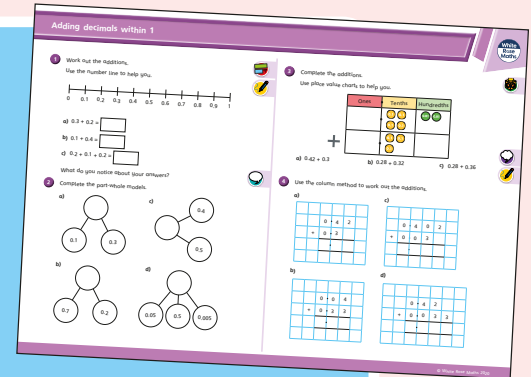
PowerPoint™ versions of the worksheet questions to incorporate them into lesson planning.
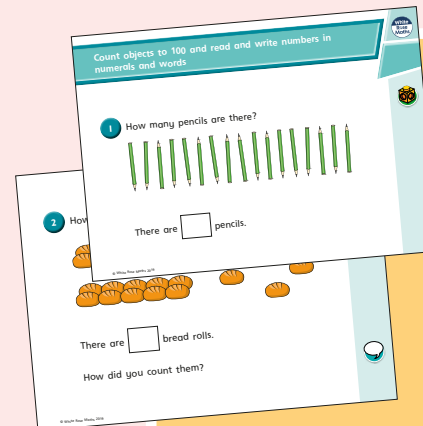
Answers to all the worksheet questions.

Premium supporting materials

Teaching slides that mirror the content of our home learning videos for each step. These are fully animated and editable, so can be adapted to the needs of any class.

REPRESENT NUMBERS TO 100

Which of these images represents 32?

Have a think

...mages represents 32?
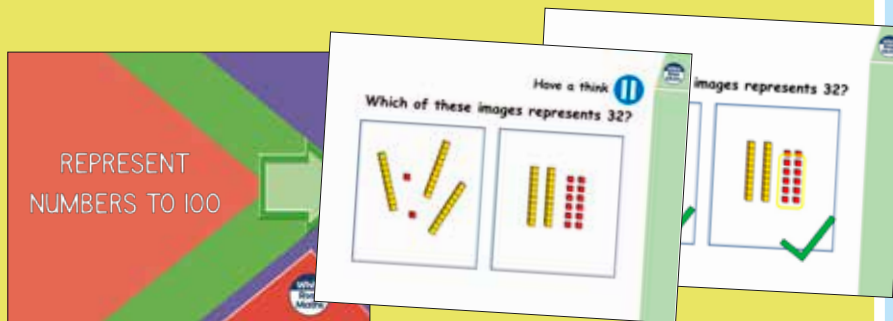
A **true or false** question for every small step in the scheme of learning. These can be used to support new learning or as another tool for revisiting knowledge at a later date.

True or False?

Fewer, more, same

There are more sheep than cows.
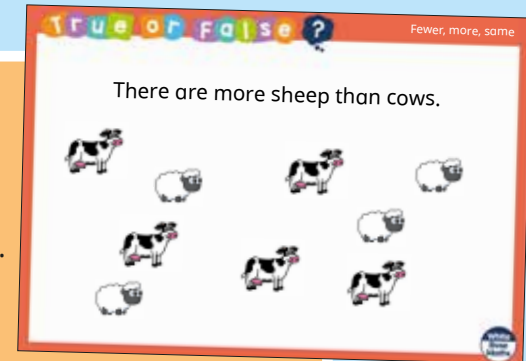
Flashback 4 starter activities to improve retention.
Q1 is from the last lesson;
Q2 is from last week;
Q3 is from 2 to 3 weeks ago;
Q4 is from last term/year.
There is also a bonus question on each one to recap topics such as telling the time, times-tables and Roman numerals.

Flashback 4

Year 4 | Week 5 | Day 1

5 × 2

1) Round 6,495 to the nearest 10, 100 and 1,000
6,500   6,500   6,000

2) Round 38 to the nearest 10   40

3) Complete the part-whole model.
7,631
7,000   600   31

4) Multiply 38 by 4   152
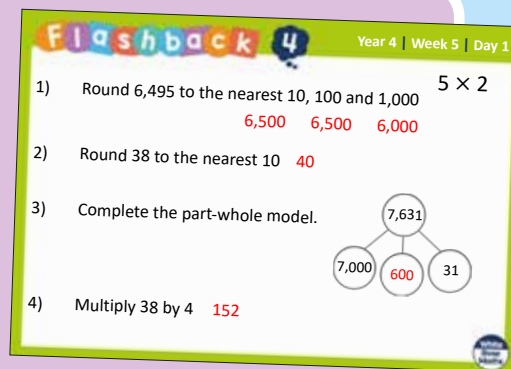
Topic-based CPD videos
As part of our on-demand CPD package, our maths specialists provide helpful hints and guidance on teaching topics for every block in our schemes of learning.

Key learning
• Counting forwards and backwards in ones and tens
• Partition flexibly

Meet the characters

Our class of characters bring the schemes to life, and will be sure to engage learners of all ages and abilities. Follow the children and their class pet, Tiny the tortoise, as they explore new mathematical concepts and ideas.

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Mrs Smith
Alex
Sam
Ron
Teddy
Rosie
Dora
Tommy
Kim
Jack
Mo
Eva
Amir
Annie
Whitney
Dexter
Jo
Tiny
Max

Yearly overview

The yearly overview provides suggested timings for each block of learning, which can be adapted to suit different term dates or other requirements.

	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 and subtraction**		Number **Multiplication and division A**			Number **Fractions A**			
Spring	Number **Multiplication and division B**			Number **Fractions B**		Number **Decimals and percentages**			Measurement **Perimeter and area**		**Statistics**	
Summer	Geometry **Shape**			Geometry **Position and direction**		Number **Decimals**			Number **Negative numbers**	Measurement **Converting units**		Measurement **Volume**

Autumn Block 1

Place value

Small steps

Step 1   Roman numerals to 1,000

Step 2   Numbers to 10,000

Step 3   Numbers to 100,000

Step 4   Numbers to 1,000,000

Step 5   Read and write numbers to 1,000,000

Step 6   Powers of 10

Step 7   10/100/1,000/10,000/100,000 more or less

Step 8   Partition numbers to 1,000,000

Small steps

Step 9	Number line to 1,000,000

Step 10	Compare and order numbers to 100,000

Step 11	Compare and order numbers to 1,000,000

Step 12	Round to the nearest 10, 100 or 1,000

Step 13	Round within 100,000

Step 14	Round within 1,000,000

Roman numerals to 1,000

Notes and guidance

In Year 4, children learned about Roman numerals to 100. In this small step, they explore Roman numerals to 1,000, and the symbols D (500) and M (1,000) are introduced.

Children explore further the similarities and differences between the Roman number system and our number system, learning that the Roman system does not have a zero and does not use placeholders.

Children use their knowledge of M and D to recognise years using Roman numerals. Asking children to write the date in Roman numerals is one way to reinforce the concept daily.

Things to look out for

- Children may mix up which letter stands for which number.

- Children may add the individual values together instead of interpreting the values based on their position, for example interpreting CD as 600 instead of 400

- It is often more difficult to convert numbers that require large strings of Roman numerals.

- Children may think that numbers such as 990 can be written as XM instead of CMXC.

Key questions

- What patterns can you see in the Roman number system?

- What rules do we use when converting numbers to Roman numerals?

- What letters are used in the Roman number system? What does each letter represent?

- How do you know what order to write the letters when using Roman numerals?

- What is the same and what is different about representing the number "five hundred and three" in the Roman number system and in our number system?

Possible sentence stems

- The letter _____ represents the number _____

- I know _____ is greater than _____ because …

National Curriculum links

- Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals

Roman numerals to 1,000

Key learning

- Each diagram should show a number in Roman numerals, digits and words.

  Complete the diagrams.

  500 / five hundred

  1,000

  CCCII
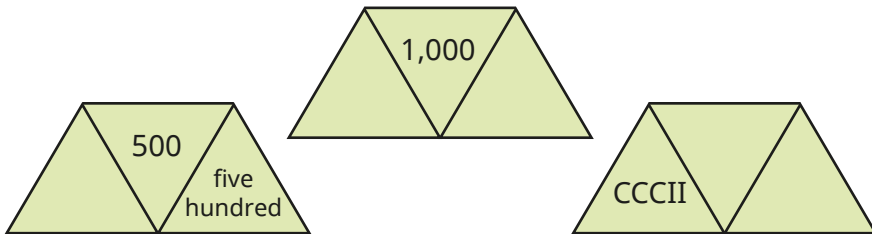
- Match the Roman numerals to the numbers.

DC	460
CD	950
CCCXX	400
DXC	590
CML	600
CDLX	320

- Here is a date written in Roman numerals.

  XXI / IX / MMXV

  What day of the month is shown?

  What month is shown?

  What year is shown?

- Here are the end credits of two films.

  The Roman numerals show the year the films were made.

  © WRM Films
  MCMXL

  © White Rose Studios
  MMIX

  In what year was the older film made?

  In what year was the more recent film made?

  How long was there between the making of the two films?

  Give your answer in Roman numerals.

Roman numerals to 1,000

Reasoning and problem solving

Work out CCCL + CL.

Give your answer in Roman numerals.

Write five calculations, using Roman numerals, that give the same answer.

Compare answers with a partner.

D
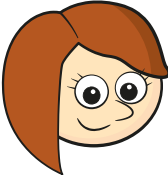
multiple possible answers, e.g.

CD + C

M ÷ II

C + CC + CC

C × V

Do you agree with Rosie?

Explain your answer.

XL − X = L

No

Is the statement true or false?

> In Roman numerals,
> 400 is CD,
> so 800 is CDCD.

False

The numbers in the sequence are increasing by CXX each time.

▢ , ▢ , DCCXC , ▢ , ▢

Work out the missing numbers in the sequence.

DL, DCLXX, CMX, MXXX

Numbers to 10,000

Notes and guidance

Children encountered numbers up to 10,000 in Year 4. In this small step, they revise this learning in preparation for looking at numbers to 100,000 and then 1,000,000

A variety of pictorial and concrete representations are used, including base 10, place value counters, place value charts and part-whole models. In particular, the ability to use place value charts needs to be secure, as this is the main representation used in the coming steps where children learn about 5- and 6-digit numbers.

Children should also be able to add and subtract 10, 100 and 1,000 to and from a given number, using their place value knowledge rather than formal written methods.

Things to look out for

- Children may not yet have fully grasped placeholders, for example reading 208 as twenty-eight.

- Children may rely on the column method of addition and subtraction when this is not necessary.

- Children may not use, or may misplace, the comma when writing numbers greater than or equal to 1,000

Key questions

- What is the value of each digit in the number?

- How can you represent the number in a different way?

- Which digit or digits would change in value if you added a 10/100/1,000 counter?

- How do you write the number in words?

Possible sentence stems

- The value of the _____ in _____ is _____

- The column before/after the _____ column is the _____ column.

- 10 _____ can be exchanged for 1 _____

- 1 _____ can be exchanged for _____

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

- Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000

Numbers to 10,000

Key learning

- What numbers are shown?
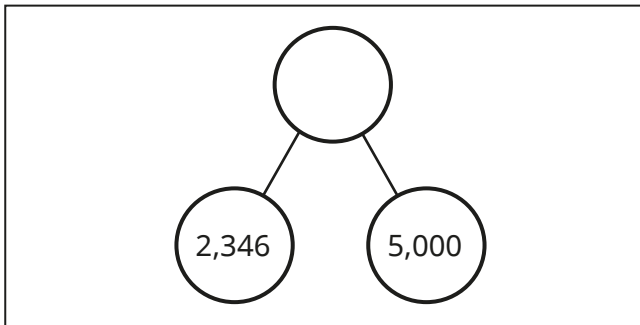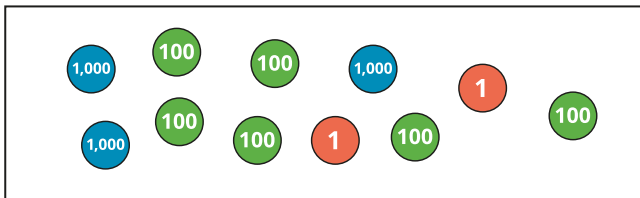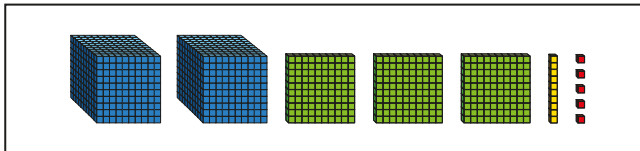
- Match the representations to the numbers.
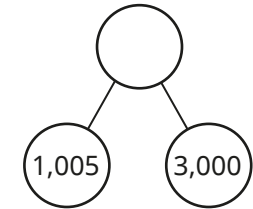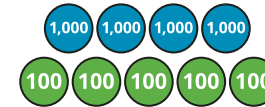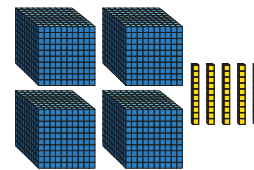
| 4,005 | 4,500 | 4,050 |

- Show the number 2,536 in three different ways.

- What number is shown in the place value chart?

What will the number be if you add a counter to the thousands column?

What will the number be if you take two counters away from the hundreds column?

Numbers to 10,000

Reasoning and problem solving

Filip has made five numbers using the digits 1, 2, 3 and 4

He is using a letter to represent each digit.

Here are his numbers.

> AABCD
> ACDCB
> DCABA
> CDADC
> BDAAB

Use the clues to work out each number.

- The first number in the list is the greatest number.
- The digits in the fourth number add up to 12
- The third number is the smallest number.

44,231

43,132

13,424

31,413

21,442

Work out the missing numbers.

	Add 10	Add 100	Add 1,000
7,516			
			5,209
		6,025	
	3,001		

	Add 10	Add 100	Add 1,000
7,516	7,526	7,616	8,516
4,209	4,219	4,309	5,209
5,925	5,935	6,025	6,925
2,991	3,001	3,091	3,991

Numbers to 100,000

Notes and guidance

In this small step, children build on the Year 4 learning revised in the previous step, and explore numbers up to 100,000

They are introduced to the ten-thousands column in a place value chart and begin to understand the multiples of 10,000. This can be reinforced using a number line to 100,000

Both place value counters and plain counters are used in place value charts, allowing for discussion about the values of the columns.

Children estimate the position of numbers such as 65,048 on a number line, preparing them for rounding later in this block.

Things to look out for

- Children are likely to use "thousands" and "millions" in everyday speech more often than "tens of thousands" or "hundreds of thousands", so they may miss out place value columns in between.

- Children may find numbers with several placeholders difficult, for example 40,020

- Children may need support in deciding when to use the word "and" when saying numbers, for example 3,100 does not use "and" but 3,010 does.

Key questions

- Counting in 1,000s, what would you say after "nine thousand"?

- Counting in 10,000s, what would you say after "sixty thousand"?

- How can you represent the number 65,000 using a number line?

- What is the value of each digit in the number?

- If 100,000 is the whole, what could the parts be?

Possible sentence stems

- The value of the _____ in _____ is _____

- The column before/after the _____ column is the _____ column.

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

- Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000

Numbers to 100,000

Key learning

- What number is shown on the place value chart?

TTh	Th	H	T	O
10,000 10,000 10,000 10,000	1,000	100 100 100	10 10	1 1

- Complete the grid to show the number in different ways.

place value counters	part-whole model
	65,048
bar model 65,048 60,000	place value chart TTh Th H T O

- Find the missing numbers.

  ▸ 59,000 = 50,000 + _____

  ▸ _____ = 30,000 + 1,700 + 80

  ▸ 75,480 = _____ + 3,000 + _____

  Do any of the questions have more than one possible answer?

- A number is shown in the place value chart.

TTh	Th	H	T	O
● ● ● ● ●	● ● ●	● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ●

What number is represented?

A counter is removed from the thousands column.
What number is represented now?

A counter is then added to the tens column.
What number is represented now?

- Count down in 10,000s from 157,000 to 27,000

Numbers to 100,000

Reasoning and problem solving

Here is a number line.

A

30,000   35,000   40,000
B
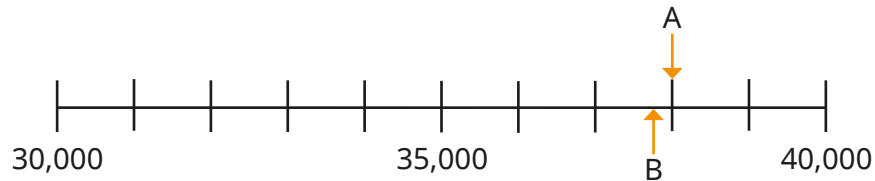
What is the value of A?

B is 100 less than A.
What is the value of B?

C is 1,000 less than B.
Label C on the number line.

A = 38,000   B = 37,900
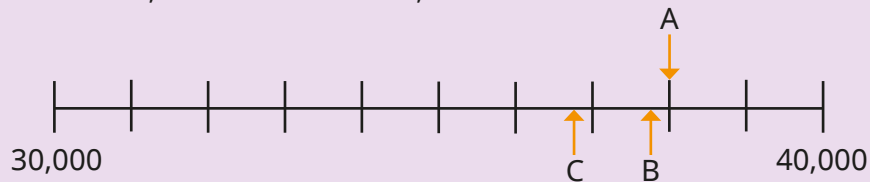
30,000   40,000
                          C   B

Write as many different numbers as you can, using each word no more than once.

You do not need to use all the words each time.

| and | four | thousand |

| one | hundred |

1, 4, 100, 104, 400, 401, 1,000, 1,004, 1,400, 4,000, 4,001, 4,100, 100,000, 100,004, 104,000, 400,000, 400,001, 401,000

List all the 5-digit numbers you can make using the digit cards.

1 2 0 0 0

12,000, 10,200, 10,020, 10,002, 21,000, 20,100, 20,010, 20,001

Numbers to 1,000,000

Notes and guidance

In this small step, children build on the previous steps and explore numbers up to 1,000,000

Children learn that the pattern for thousands in a place value chart follows the same pattern as that of the ones: ones, tens, hundreds, (one) thousands, ten thousands, hundred thousands. Children recognise large numbers presented in a variety of ways using familiar models. Reading numbers is touched on in this step and then developed in the next step, which also looks at writing numbers in words.

Partitioning is introduced but will be covered in more detail later in the block.

Things to look out for

- Children may find it difficult to conceptualise such large numbers as they lie outside their everyday experience and cannot easily be represented concretely.

- Unless they are confident with the previous step, children may think that place value columns go in the order ones, tens, hundreds, thousands, millions.

- Children may find numbers with several placeholders difficult.

Key questions

- Where do the commas go when writing one million in numerals?

- How does a place value chart help you to represent large numbers?

- What is the value of each digit in this number?

- Are 6-digit numbers always greater in value than 5-digit numbers?

- When do you use placeholders in numbers?

- If one million is the whole, what could the parts be?

Possible sentence stems

- The value of the _____ in _____ is _____

- The column before/after the _____ column is the _____ column.

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

- Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000

Numbers to 1,000,000

Key learning

- What number is shown in each place value chart?

  Give your answers in numerals.

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

Thousands			Ones		
H	T	O	H	T	O
●● ●●	●●	●●	●● ●●	●● ●●	●

  What is the same and what is different about these place value charts?

- Use counters to make the numbers on a place value chart.

  | 32,651 | 463,215 | 320,154 | 60,020 |

- Count in 100,000s from zero to 1 million.

- Use counters to make the numbers on the place value chart.

  | 372,524 | 206,401 | 300,042 | 71,560 |

Thousands			Ones		
H	T	O	H	T	O

  How would you say the numbers?

- What is the value of the 4 in each number?

124,306	245,812	402,001
321,247	604,513	45,872

- Write four numbers that have a 3 in the hundreds column.

  Each number should have a different number of digits.

Numbers to 1,000,000

Reasoning and problem solving

Here are two ways of partitioning one million into multiples of 100,000

1,000,000	
600,000	400,000

```
        1,000,000
       /         \
  300,000      700,000
```
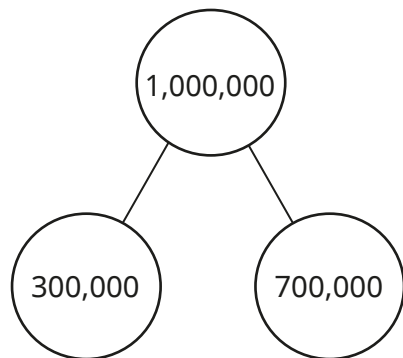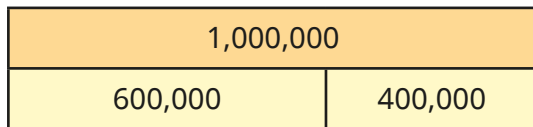
How many other ways can you find to partition one million into multiples of 100,000?

Show your answers as bar models and part-whole models.

There are four more ways:

- 0 and 1,000,000
- 100,000 and 900,000
- 200,000 and 800,000
- 500,000 and 500,000

The numbers can be written in either order.

Use the digit cards to make as many 6-digit numbers as you can.

5	5	5
0	0	0
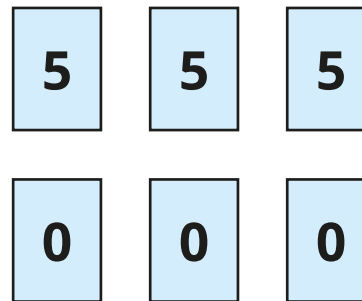
What is the greatest number you can make?

What is the smallest number you can make?

What is the difference between the greatest and smallest numbers?

Ten 6-digit numbers can be made:

555,000	505,050
550,500	505,005
550,050	500,550
550,005	500,505
505,500	500,055

555,000

500,055

54,945

Read and write numbers to 1,000,000

Notes and guidance

Children should be secure with the place value of numbers to 1,000,000. In this small step, they develop their skill at reading and writing large numbers in words, which has been touched on in earlier steps.

While the spelling of the individual words is important, the focus of the step is the structure of the written words, for example we read and write 4,100 as "four thousand one hundred" but 4,010 as "four thousand and ten".

Using a comma as a separator helps with reading and writing numbers in two parts, and a part-whole model or place value chart can be used to support this.

Key questions

- When a number is written with commas, what do the numbers before/after each comma represent?

- How can this number be represented using a part-whole model? What parts would it be sensible to use?

- How do you write "1,000,000" in words?

- When do you use the word "and" when reading or writing a number?

Possible sentence stems

- The number before/after the comma is _____. This part of the number is said/written as _____

- The whole of the number is said/written as _____

Things to look out for

- Children who find the "teen" numbers difficult may have problems with numbers such as 317,413

- Children may find reading and writing numbers with placeholders (for example, 700,011) difficult.

- Knowing when to use the word "and" within a number can sometimes cause confusion.

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

- Solve number problems and practical problems involving the above

Read and write numbers to 1,000,000

Key learning

- Scott is using a part-whole model to help write the number 145,362 in words.

145,362
145,000   362

one hundred and forty-five thousand and three hundred and sixty-two
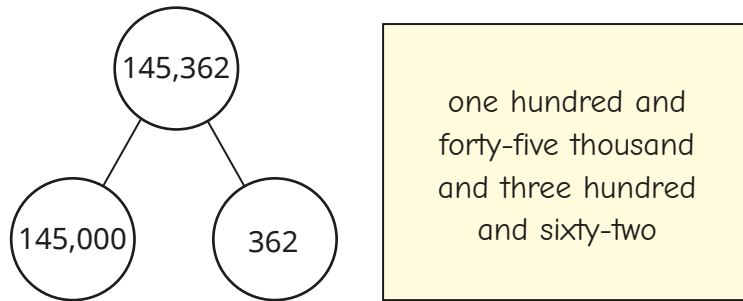
Scott has made one mistake.

Write 145,362 correctly in words.

- 56,402 is shown in the place value chart.

Thousands			Ones		
H	T	O	H	T	O
	●● ●● ●	●● ●● ●●	●● ●●		●●

Write the number 56,402 in words.

How does the place value chart help you?

- Write the numbers in words.

1,256	12,560	125,600	120,560	120,506

You could write the numbers in a place value chart to help you.

- A number is made up of 2 ten-thousands, 5 hundreds and 7 ones.

Show the number on a place value chart.

Write the number in words and numerals.

- Write the numbers in numerals.

three hundred and six thousand and fifteen

three hundred and six thousand and fifty

three hundred and fifteen thousand and six

- Use place value counters to make the number "half a million".

Write the number "half a million" in numerals.

Read and write numbers to 1,000,000

Reasoning and problem solving

I'm thinking of a 6-digit number. The sum of the digits is 2
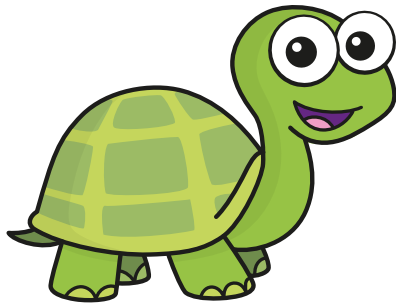
Find all the possible numbers Tiny could be thinking of.

Give your answers in words and numerals.

Investigate with different digit sums.

What do you notice?

| 200,000 two hundred thousand |
| 110,000 one hundred and ten thousand |
| 101,000 one hundred and one thousand |
| 100,100 one hundred thousand, one hundred |
| 100,010 one hundred thousand and ten |
| 100,001 one hundred thousand and one |

When written in words, what is the first number that includes the letter "a"?

one hundred and one

Ron is thinking of a number.

My number is made up of 7 hundred-thousands, 13 thousands and 19 tens.
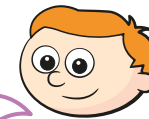
What is 1,000 less than Ron's number?

What is 10 more than Ron's number?

Give your answers in words.

seven hundred and twelve thousand, one hundred and ninety

seven hundred and thirteen thousand, two hundred

Powers of 10

Notes and guidance

In this small step, children further develop their understanding of place value by exploring the relationship between numbers in different columns.

As well as adjacent columns, they look at columns that are further apart, for example considering the number of tens needed to make 1,000 and then multiples of 1,000. Children use both place value charts and Gattegno charts to support their understanding. You could demonstrate exchanging with place value counters as extra support if needed.

Multiplication by 10, 100 and 1,000 is covered in detail later in the term. The focus here is on the place value of the digits rather than performing calculations.

Things to look out for

- Children may not realise that the overall effect of, for example, × 10 followed by × 10 is × 100

- Children may find it confusing that numbers increase by a factor of 10 horizontally on a place value chart but vertically on a Gattegno chart.

Key questions

- How can you tell if a number is a power of 10?

- Is this number a multiple of a power of 10? How can you tell?

- If you move a digit one place to the left in a place value chart, how many times greater is the value of the digit?

- If you move a digit two places to the left in a place value chart, how many times greater is the value of the digit?

- What patterns can you see in the Gattegno chart?

Possible sentence stems

- There are _____ hundreds in 1,000 and _____ thousands in _____. This means there are _____ hundreds in _____

- _____ is _____ the size of _____

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
- Solve number problems and practical problems that involve the above

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Powers of 10

Key learning

- Make the number 425 on a place value chart.

Thousands			Ones		
H	T	O	H	T	O

Now make the number 4,250

What is the same and what is different?

- How many tens are there in 100?

  How many tens are there in 200?

  How many tens are there in 210?

  How many tens are there in 740?

- How many tens are there in 100?

  How many tens are there in 1,000?

  How many tens are there in 2,000?

  How many hundreds are there in 2,000?

- What number is shown on the Gattegno chart?

100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
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

Use the chart to find the number 100 times the size of the number shown.

Use the chart to make the number one-tenth the size of the number shown.

- Complete the sentences.

  ▶ There are 1,000 metres in a kilometre.

  _____ km is the same distance as 68,000 m.

  ▶ There are 1,000 millimetres in a metre.

  _____ mm is the same length as 803 m.

Powers of 10

Reasoning and problem solving

Whitney and Amir use a Gattegno chart to answer questions.

My answer is 620,000

Whitney

What could Whitney's question be?

My answer is 602,000

Amir

What could Amir's question be?

multiple possible answers, e.g.

What is 10 times the size of 62,000?

multiple possible answers, e.g.

What is 100 times the size of 6,020?

Large areas are measured in hectares.

1 hectare = 10,000 m^2

The area of the Eden Park stadium in New Zealand is 15 hectares.

What is the area of Eden Park in m^2?

How many plots with an area of 100 m^2 could be made in Eden Park?

150,000 m^2

150

1,000 × 1,000 = 1,000,000

How many other calculations using just ones and zeros can you find that have the answer 1,000,000?

multiple possible answers, e.g.

10,000 × 100

100,000 × 10

1,000,000 × 1

100 × 100 × 100

100 × 10 × 1,000

10/100/1,000/10,000/100,000 more or less

Notes and guidance

In this small step, children use place value to find numbers 10/100/1,000/10,000/100,000 more or less than a given number. They need to be able to count both forwards and backwards in steps of powers of 10, and should be encouraged to spot patterns in the sequences formed by doing this. Children could be stretched to consider the rule that connects consecutive terms in the resulting sequences.

As well as finding consecutive values when counting forwards and backwards, children should also be able to find missing numbers that lie between two other given values.

A Gattegno chart is useful to support adding the correct power of 10, and to see what happens when crossing a 10/100/1,000 … boundary.

Things to look out for

- Children may make errors when they are counting across a multiple of 10, 100, 1,000 … For example, 2,080, 2,090, 3,000

- More support may be needed when counting backwards.

Key questions

- How can you use a place value chart to find 10/100/1,000 … more/less than a given number?

- How can you use a Gattegno chart to find 10/100/1,000 … more/less than a given number?

- How many digits of the number will change if you add 10/100/1,000 … to the given number?

- What is the same and what is different about the patterns of the numbers vertically and horizontally in a Gattegno chart?

Possible sentence stems

- _____ more/less than _____ is _____

- _____ is _____ more/less than _____

National Curriculum links

- Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

10/100/1,000/10,000/100,000 more or less

Key learning

- Here is a Gattegno chart showing the number 32,450

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

What number is 10 more than 32,450?

What number is 100 less than 32,450?

What number is 10,000 less than 32,450?

- 20,417 is shown in the place value chart.

TTh	Th	H	T	O

What is 100 more than 20,417?

What is 10 less than 20,417?

What is 1,000 less than 20,417?

- Complete the number tracks.

663	673		693		713	

7,200		7,000			

7,200		6,800			

- Count up in 1,000s starting from 6,240

  Count up in 10,000s starting from 6,240

  Count up in 100,000s starting from 6,240

- Correct the mistake in each number sequence.

7,875	,	8,875	,	9,875	,	11,875	,	12,875	,	13,875

864,664	,	764,664	,	664,664	,	554,664	,	444,664

10/100/1,000/10,000/100,000 more or less

Reasoning and problem solving

Amir is counting in thousands.

Amir: 3,000, 4,000, 5,000, 6,000, 7,000
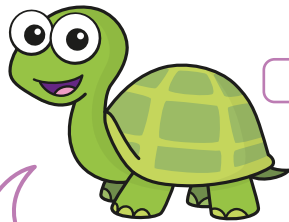
Tiny: The tenth number Amir will say is 14,000 because it is double 7,000

Do you agree with Tiny?

Explain your answer.

No

Jack: I am counting up in tens from 184 I will include 224

Whitney: I am counting up in hundreds from 604 I will include 1,040

Teddy: I am counting up in thousands from 13 I will include 13,000

Are the children correct?

Explain how you know.

Jack is correct.

Whitney is incorrect. All her numbers will end in 04

Teddy is incorrect. All his numbers will end in 13

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Partition numbers to 1,000,000

Notes and guidance

Children have been partitioning numbers since Year 2. In this small step, they extend their knowledge to deal with larger numbers while consolidating their understanding of the place value columns that have been introduced this year.

They partition numbers in the standard way (for example, into thousands, hundreds, tens and ones) as well as in more flexible ways (for example, 15,875 = 14,875 + 1,000 and 15,875 = 13,475 + 2,400).

Understanding of partitioning, for example changing 62 to 50 + 12, supports methods for addition and subtraction that will be reviewed in the next block.

Things to look out for

- Children may make mistakes with the order of the digits when partitioning/recombining numbers with many digits.
- Children may be less familiar with non-standard partitioning and need the support of, for example, place value counters to see alternatives.
- Children may wish to apply a formal method when the values of the digits in the columns make it more appropriate.

Key questions

- What number is being represented?
- How can place value cards be used to help partition a number?
- If you have 10 hundreds/thousands/ten-thousands, what can these be exchanged for?
- How does knowing that 9 + 5 = 14 help you to work out 9 tens + 5 tens? What about 9 thousands + 5 thousands?
- How else can you say/write "14 tens" or "14 thousands"?

Possible sentence stems

- The value of the first digit is _____
- The value of the next digit is _____
- _____ is equal to _____ thousands, _____ hundreds, _____ tens and _____ ones.

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

Partition numbers to 1,000,000

Key learning

- Partition the numbers into thousands, hundreds, tens and ones.

  ▶ 6,789 = _____ + _____ + _____ + _____

  ▶ 4,813 = _____ + _____ + _____ + _____

- Complete the number sentences.

  ▶ _____ = 20,000 + 7,000 + 800 + 40 + 3

  ▶ 560,830 = _____ + 60,000 + _____ + 30

- Move the place value counters around and make exchanges to help you complete the partitions.

  32,426 = 30,000 + 2,000 + _____ + 20 + 6

  32,426 = 20,000 + _____ + 400 + 10 + _____

  32,426 = 10,000 + 22,000 + _____ + _____

  Is there more than one answer for any of these?

  Find other ways to partition the number.
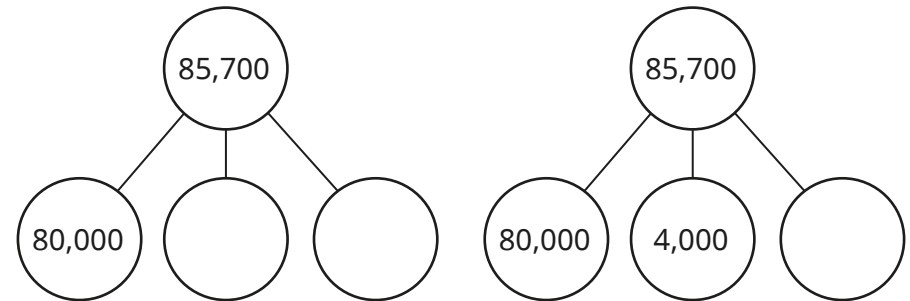
- Aisha is partitioning 45,627

  $$40 + 50,000 + 600 + 2 + 7,000 = 45,627$$

  Explain why Aisha's workings are wrong.

  Find the correct total.

- Complete the part-whole models for 85,700

  Find three more ways of partitioning 85,700 into three parts.

- Complete the calculations.

  ▶ 367,201 = 200,000 + _____

  ▶ 40,000 + 27,600 + 250 = _____

  ▶ 945,006 = 610,000 + _____ + 6

Partition numbers to 1,000,000

Reasoning and problem solving

Esther is partitioning a number written in Roman numerals.

> MMDXL = M + M + D + X + X + X + X

Is Esther correct?

Find some other ways of partitioning the number using Roman numerals.

Esther is correct.

_____

multiple possible answers, e.g.

MM + CD + C + XL

M + D + D + D + XL

Which is the odd one out?

| 680,000 | 680 thousands | 68 ten-thousands |

| 5 hundred-thousands plus 180 thousands | 680 hundreds |

680 hundreds is the odd one out, as it is equal to 68,000

The rest are equal to 680,000

Some of the place value counters are hidden.
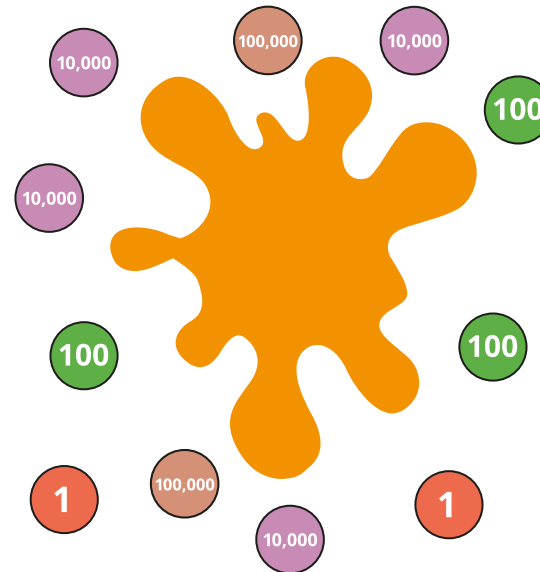
The total value of the counters is 265,312

What place value counters could be hidden?

Find at least three solutions.

any set of counters that add up 25,010

multiple possible answers, e.g.

- two 10,000 counters, five 1,000 counters and one 10 counter

- twenty-five 1,000 counters and one 10 counter

- two 10,000 counters, three 1,000 counters, twenty 100 counters and one 10 counter

Number line to 1,000,000

Notes and guidance

This step begins with a recap of number lines to 10,000, before moving on to explore number lines up to 100,000 and 1,000,000

Children label partially completed number lines, identify points labelled on number lines and show where a given number would lie on a number line. They look at both the exact placement of multiples of 10,000 or 100,000 and the approximate placement of numbers such as 245,678

Recognising the value of the midpoint between two multiples on a number line is key to their understanding and will support the use of number lines when rounding numbers in later steps.

Things to look out for

- Where number lines have more than one set of divisions, children may mix up the intervals between large divisions and smaller divisions.

- Children may confuse the number of intervals and the number of divisions.

- Children may not use the correct multiples when looking at midpoints, for example thinking the midpoint between 1,000 and 2,000 is 1,005

Key questions

- What are the values at the start and the end of the number line?

- How many large intervals are there in the whole number line? What is each large interval worth?

- How many small intervals are there between each of the large intervals on the number line? What is each small interval worth?

- What is the midpoint between _____ and _____ ?

Possible sentence stems

- The difference in value between the start and end point is _____

- There are _____ intervals.
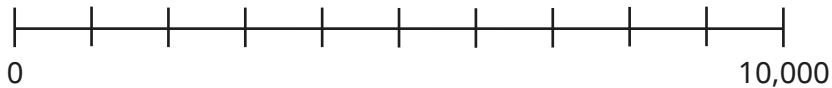
- The number line is counting up in _____

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

- Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000

Number line to 1,000,000

Key learning

- Label the number lines.
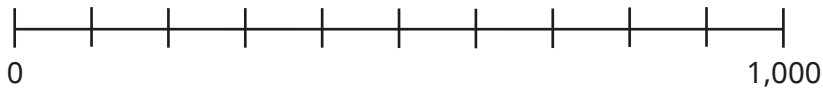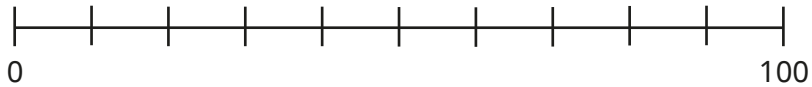
  What is the same? What is different?

- What numbers are the arrows pointing to?
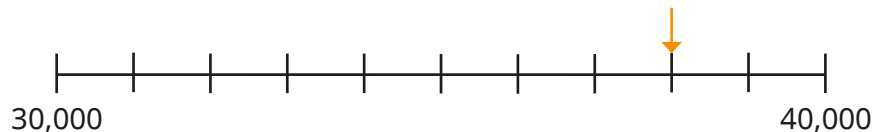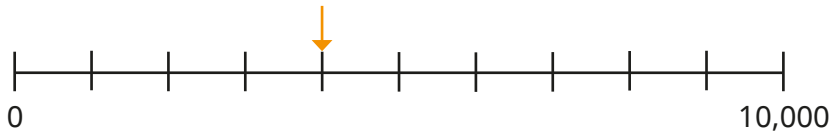
- What numbers are the arrows pointing to?
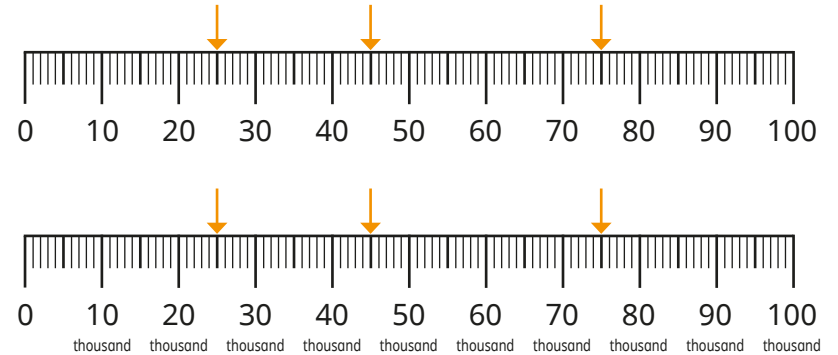
  What is the same about the number lines? What is different?

- Label the start and end points on the number line.

-
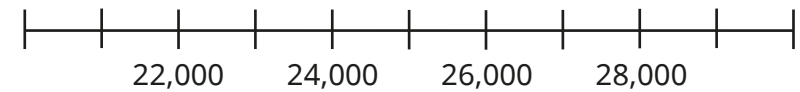
  Draw arrows on the number line to show:

  - the exact position of 60,000

  - the approximate position of 35,000

  - the approximate position of 82,369

Number line to 1,000,000

Reasoning and problem solving

Estimate the position of 42,500 on each number line.

42,000   43,000

40,000   50,000

0   100,000

20,000   60,000
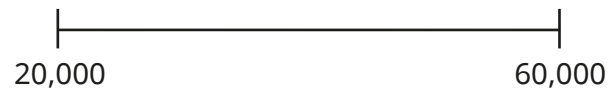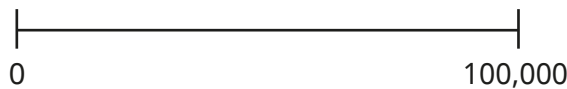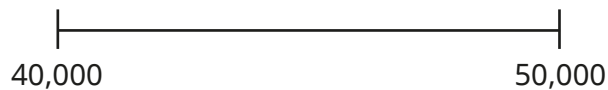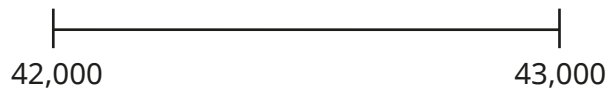
Explain your method.

Children should draw an arrow to the approximate position on each number line and be able to explain their reasoning.

Use the digit cards to complete the labels on the number lines.

| 1 | 2 | 3 | 4 | 5 | 6 |

☐☐,000   ☐☐,000

100,000   300,000

| 4 | 5 | 6 | 7 | 8 | 9 |

☐☐,000   ☐☐,000

400,000   800,000
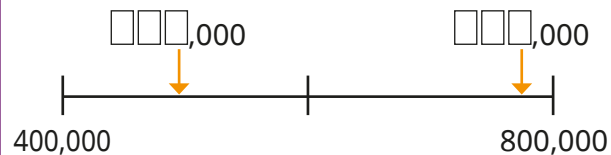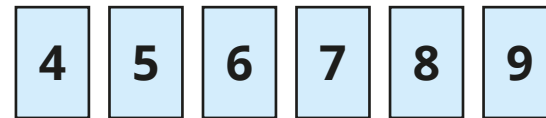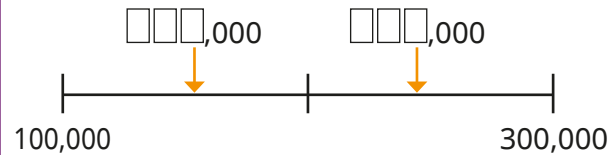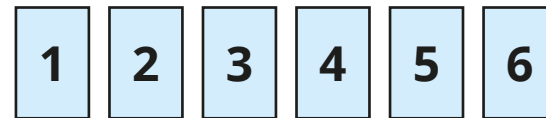
multiple possible answers, e.g.

156,000 and 243,000

496,000 and 785,000

Compare and order numbers to 100,000

Notes and guidance

In this small step, children build on their learning of comparing and ordering numbers in earlier years to compare and order numbers up to 100,000

They can use a variety of representations to help them, such as place value counters, place value charts and number lines, but the main focus of the step is to compare and order using the place value of the digits within the numbers. Children first compare pairs of numbers and then move on to ordering sets of three or more numbers.

This small step provides an opportunity to revisit previous learning from this block, as children could be asked to compare and order numbers that are written in Roman numerals.

Things to look out for

- Children may only look at the digits and not consider the place value of the digits within the numbers.

- Where numbers have a different number of digits, children may only look at the first digit.

- Children often confuse the inequality symbols and their meanings.

Key questions

- Which digit in each number has the greatest value? What are the values of these digits?

- When comparing two numbers with the same number of digits, if their first digits are equal in value, what do you look at next?

- What is the difference between ascending and descending order?

- What is different about comparing numbers with the same number of digits and comparing numbers with different numbers of digits?

Possible sentence stems

- The first place value column I need to look at is _____

- _____ is greater/less than _____ , so _____ is greater/less than _____

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

Compare and order numbers to 100,000

Key learning

- Identify the greater number in each pair.

  ▶ 63 and 68

  ▶ 63,000 and 68,000

  ▶ 63,912 and 68,002

  What is the same and what is different?

- Which is the greater number?

TTh	Th	H	T	O

- Write <, > or = to make the statements correct.

  45,000 ◯ 54,000

  10,160 ◯ 9,999

  65,000 ◯ 60,700

- Put the numbers in order, starting with the smallest.

  You can use the number line to help you.

  6,400   60,400   46,000   40,600   20,600   6,004
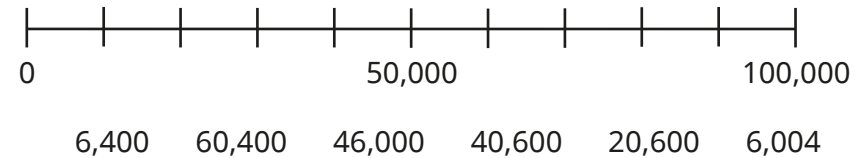
- Use six counters to make five different 5-digit numbers.

TTh	Th	H	T	O

  Order your numbers from greatest to smallest.

- Write the numbers in ascending order.

  | 34,706 | MMMDXL | 3,099 |

  | 5,000 more than thirty thousand | thirty-three thousand and thirty-three |

Compare and order numbers to 100,000

Reasoning and problem solving

Any 6-digit whole number is greater than all 5-digit whole numbers.

Do you agree with Dexter?
Explain your answer.

Yes

Here are six digit cards.

7 **2** **5** **1** **9** **3**
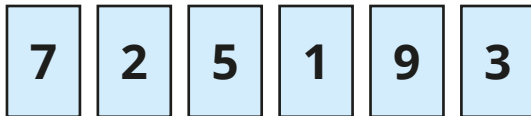
Using five of the digits, what is the greatest number you can make?

Using all six digits, what is the smallest number you can make?

97,532

123,579

Use the digit cards to make three different 5-digit numbers that match the clues.

0 **1** **2** **3** **4**
5 **6** **7** **8** **9**
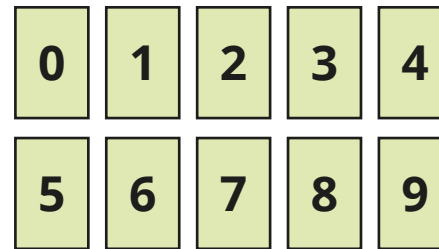
- The digit in the ones column and the digit in the hundreds column have a difference of 2
- The digit in the hundreds column and the digit in the ten-thousands column have a difference of 2
- The sum of all the digits in the number is 19

Write your numbers in ascending order.

multiple possible answers, e.g.

18,325

47,260

56,341

Compare and order numbers to 1,000,000

Notes and guidance

In this small step, children build on the previous step to compare and order numbers up to 1,000,000

The representations used previously can continue into this step; however, the focus will shift more towards number lines as they are more efficient when representing numbers of increasing value.

Encourage children to make connections between the position of numbers on a number line and their value. They should recognise that when working on horizontal number lines, numbers further to the right have a greater value. Word problems involving real-world examples, such as comparing populations, are also introduced.

Things to look out for

- Children may only look at the digits and not consider the place value of the digits within the numbers.

- Children may need to be reminded of the meanings of the inequality symbols as well as the words "ascending" and "descending".

- Placeholders can cause difficulty when working with larger numbers.

Key questions

- Which digit in each number has the greatest value? What are the values of these digits?

- When comparing two numbers with the same number of digits, if their first digits are equal in value, what do you look at next?

- What is the difference between ascending and descending order?

- What is different about comparing numbers with the same number of digits and comparing numbers with different numbers of digits?

Possible sentence stems

- The first place value column I need to look at is _____

- _____ is greater/less than _____ , so _____ is greater/less than _____

National Curriculum links

- Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit

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Compare and order numbers to 1,000,000

Key learning

- Identify the greater number in each pair.

  ▶ | 59 | | 51 |

  ▶ | 59,000 | | 51,000 |

  ▶ | 590,000 | | 510,000 |

  What is the same and what is different?

- Write <, > or = to make the statements correct.

  450,000 ◯ 540,000   101,600 ◯ 99,999

  650,000 ◯ 607,000   312,007 ◯ 312,070

- Put the numbers in ascending order.

  You can use the number line to help you.

  0   500,000   1,000,000
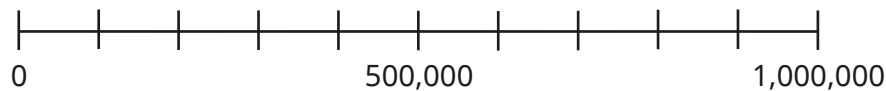
  | 64,000 | 604,000 | 460,000 | 40,600 | 200,600 | 6,004 |

- The table shows the populations in some towns and cities in Yorkshire.

  List the towns and cities in descending order of population.

Town or city	Population
Halifax	88,134
Brighouse	32,360
Leeds	792,925
Huddersfield	146,234
Wakefield	343,932
Bradford	536,986

- Estimate the positions of the numbers on the number line.
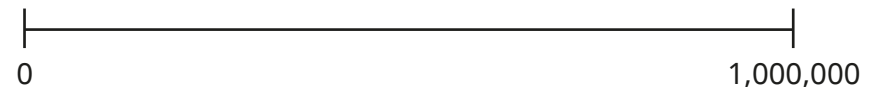
  0   1,000,000

  A four hundred and ten thousand

  B 95,770

  C half a million

  D eight hundred thousand

  Write the numbers in ascending order.

Compare and order numbers to 1,000,000

Reasoning and problem solving

Here are four number cards.

| 101,080 | one hundred thousand |
| one thousand one hundred | 99,280 |

Mo, Annie and Ron each choose a card.

Mo: My number has the greatest value.

Annie: My number has 8 tens.

Ron: My number is greater than Annie's but less than Mo's.

Which card is left over?

one thousand one hundred

Write <, > or = to make the statements correct.

600,000 + 80,000 ◯ 618,000

10,000 less than 723,000 ◯ 722,000

999,999 ◯ one million

50,000 ◯ half a million

20 ten-thousands ◯ 200 thousands

> ———
< ———
< ———
< ———
= ———

Round to the nearest 10, 100 or 1,000

Notes and guidance

In this small step, children build on their knowledge of rounding to the nearest 10, 100 and 1,000 from Year 4, now also rounding numbers beyond 10,000 to these degrees of accuracy.

It is important that children hear and use the language of "rounding to the nearest" rather than "rounding up" and "rounding down", as this can lead to errors. Number lines are a particularly useful tool to support this, as children can see which multiples of 10, 100 or 1,000 the given numbers are closer to. It is worth discussing with children the convention that when there is a 5 in the relevant place value column, despite being exactly halfway between the two multiples, we round to the next one.

Things to look out for

- Children may not round to the correct degree of accuracy, for example rounding to the nearest 100 instead of the nearest 1,000

- Children may be confused by the language "round down"/"round up" and thus round 72,160 to 71,000 (or 71,160) when asked to round to the nearest 1,000

- Children may look at the thousands digit rather than the hundreds when rounding to the nearest 100

Key questions

- Which multiples of 10/100/1,000 does the number lie between?

- Which multiple on the number line is the number closer to?

- What is the number rounded to the nearest 10/100/1,000?

- Which place value column should you look at to round the number to the nearest 10/100/1,000?

- What happens when a number is exactly halfway between two numbers on a number line?

Possible sentence stems

- The previous multiple of 10/100/1,000 is _____

- The next multiple of 10/100/1,000 is _____

- _____ is closer to _____ than _____

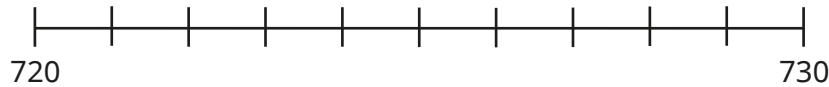- _____ rounded to the nearest 10/100/1,000 is _____

National Curriculum links

- Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000
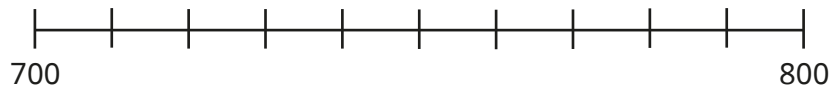
Round to the nearest 10, 100 or 1,000

Key learning

- Mark the position of 728 on the number line.

720   730

Use the number line to round 728 to the nearest 10

Now estimate the position of 728 on this number line.

700   800

Use the number line to round 728 to the nearest 100

- Between which two multiples of 1,000 does the number 6,741 lie?

What is 6,741 rounded to the nearest 1,000?

- 3,500 is exactly halfway between 3,000 and 4,000

What is 3,500 rounded to the nearest 1,000?

- 8,317 people attend a pop concert.

Round the number of people at the concert to the nearest 10

Round the number of people at the concert to the nearest 100

Round the number of people at the concert to the nearest 1,000

- 31,409 people attend a football match.

Round the number of people at the match to the nearest 100

Round the number of people at the match to the nearest 1,000

- Eva runs every night for a week.

Altogether she runs 28,650 m.
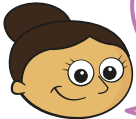
Round the distance she runs to the nearest 100 m.

Round the distance she runs to the nearest kilometre.

- Which numbers round to 4,600 to the nearest 100?

| 4,620 | 4,605 | 4,590 | 4,545 | 4,499 | 4,650 |

Round to the nearest 10, 100 or 1,000

Reasoning and problem solving

My number rounded to the nearest 10 is 1,150
Rounded to the nearest 100, my number is 1,200
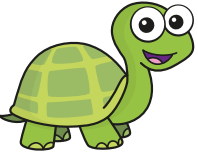
Find all the possible whole number values of Dora's number.

1,150, 1,151, 1,152
1,153, 1,154

When rounded to the nearest 10, a number is 50

When rounded to the nearest 100, the number is zero.

Find all the possible whole number values of the number.

45, 46, 47, 48, 49

4,725 rounded to the nearest 1,000 is 5,025

Explain why Tiny is wrong.

When rounding to the nearest 1,000, the answer must be a multiple of 1,000

The correct answer is 5,000

Mo is thinking of a number.

- The number is 5,000 when rounded to the nearest 1,000
- The number is also 5,000 when rounded to the nearest 100
- The number is also 5,000 when rounded to the nearest 10
- The number is not 5,000

What is the greatest possible value of the number?

5,004

Round within 100,000

Notes and guidance

In this small step, children build on their learning in the previous step to round any number within 100,000 to the nearest 10, 100, 1,000 or 10,000. Rounding to the nearest 10,000 is the new learning.

They should be confident with multiples of 10,000 from earlier steps in this block, and the process of rounding is also familiar. Children need to realise that the midpoint of two multiples of 10,000 ends in 5,000, so they need to look at the digit in the thousands column to determine how to round the number.

As in the previous steps, be careful with the language of "round up" and "round down" in case children mistakenly change the wrong digits when rounding.

Things to look out for

- Children may not look at the correct column to make their decisions about rounding, for example rounding 24,555 to 30,000 to the nearest 10,000 as they have misapplied the rule "5 or more rounds up".

- Children may be confused by the language "round down"/"round up", for example rounding 78,564 to 88,564 to the nearest 10,000

Key questions

- Which multiples of 10,000 does the number lie between?

- Which division on the number line is the number closer to?

- What is the number rounded to the nearest 10,000?

- Which place value column should you look at to round the number to the nearest 10/100/1,000/10,000?

- What happens if a number lies exactly halfway between two multiples of 10,000?

Possible sentence stems

- The previous multiple of 10,000 is _____

- The next multiple of 10,000 is _____

- _____ is closer to _____ than _____

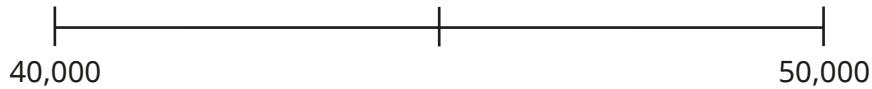- _____ rounded to the nearest 10,000 is _____

National Curriculum links

- Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000

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Round within 100,000

Key learning

- 40,000   50,000

  What number is halfway between 40,000 and 50,000?

  Draw an arrow to show the approximate position of 48,725 on the number line.

  Round 48,725 to the nearest 10,000

- Round 86 and 174 to the nearest 10

  Round 86,000 and 174,000 to the nearest 10,000

  What is the same and what is different?

- Round each number to the nearest 10,000

41,000	41,900
41,009	41,999
41,090	4,199

  What is the same and what is different?

- The circumference of Earth is 24,901 miles.

  Round this distance to the nearest 1,000 miles.

  Round this distance to the nearest 10,000 miles.

  Which is the better approximation to use?

- Alex is thinking of a number.

  When rounded to the nearest 10,000, my number is 10,000
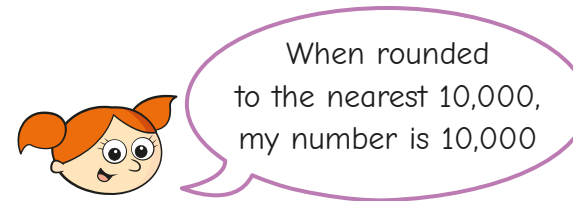
  Which of these numbers could be Alex's number?

8,000	18,000	12,000	2,000	5,000

15,000	1,500	4,999	14,999

  Explain how you know.

Round within 100,000

Reasoning and problem solving

Here is a newspaper headline about a football match.

SPORT
60,000 watch
United beat Rovers

Do you think exactly 60,000 people watched the football match?

What is the smallest number of people who watched the match, if the number in the headline has been:

- rounded to the nearest 10,000
- rounded to the nearest 1,000
- rounded to the nearest 100?

The headline is probably not an exact value.

_____

55,000

59,500

59,950

The difference between two 5-digit numbers is 5

When the numbers are rounded to the nearest 1,000, the difference is 1,000

What could the numbers be?

any two 5-digit numbers with a difference of 5 where the last three digits are between 496 and 504, for example 52,498 and 52,503

By rounding both numbers to the nearest 10,000, estimate the answer to the calculation.

$$47,826 + 88,112$$

Is your estimate greater than or less than the actual answer?

How do you know?

140,000

_____

greater

Round within 1,000,000

Notes and guidance

Building on the previous two steps, children now round any number up to 1,000,000 to any power of 10 up to 100,000. This is the first time that children round to the nearest 100,000

You may wish to practise counting in 100,000s first, and then practise rounding to the nearest 100,000 before looking at mixed questions.

It is worth discussing which approximations are most appropriate, for example why we would not give the population of a city to the nearest 10 or the population of a small town to the nearest 100,000

Things to look out for

- Children may not look at the correct column to make their decisions about rounding, for example rounding 245,555 to 300,000 to the nearest 100,000 as they have misapplied the rule "5 or more rounds to the next multiple".

- Children may be confused by the language "round down"/"round up", for example rounding 428,513 to 328,513 (or 300,000) to the nearest 100,000

- Children may not round to the required degree of accuracy, for example misreading "round to the nearest 100,000" as "round to the nearest 100".

Key questions

- Which multiples of 100,000 does the number lie between?
- How can you represent the rounding of this number on a number line?
- Which division on the number line is the number closer to?
- What is the number rounded to the nearest 100,000?
- What is the most appropriate way of rounding this number?
- What place value column should you look at to round the number to the nearest 10/100/1,000/10,000/100,000?

Possible sentence stems

- The previous multiple of 100,000 is _____

- The next multiple of 100,000 is _____

- _____ is closer to _____ than _____

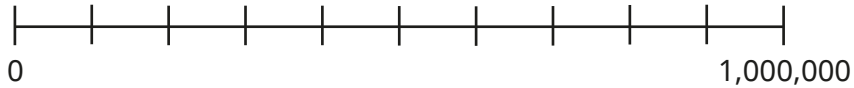- _____ rounded to the nearest 100,000 is _____

National Curriculum links

- Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000

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Round within 1,000,000

Key learning

- Complete the number line.

  Between which two multiples of 100,000 does 735,292 lie?

  Round 735,292 to the nearest 100,000

- The table shows the masses of some famous statues.

Statue	Mass
Statue of Liberty	201,400 kg
Christ the Redeemer	635,000 kg
Spring Temple Buddha	987,000 kg
Mustang Stone Buddha	58,000 kg

  Round the mass of each statue to the nearest 10,000 kg.

  Round the mass of each statue to the nearest 100,000 kg.

- The average distance of the Moon from Earth is 384,389 km.

  Round this distance to the nearest 1,000 km.

  Round this distance to the nearest 10,000 km.

  Round this distance to the nearest 100,000 km.

  Which do you think is the most appropriate number to round the distance to?

- The greatest ever attendance at a football match was the World Cup final between Brazil and Uruguay in 1950

  173,850 people watched the game.

  Round this number to the nearest 1,000, 10,000 and 100,000

  Which do you think is the most appropriate number to round the attendance to?

- My number is 800,000 when rounded to the nearest 100,000

  What is the greatest integer Amir could be thinking of?

  What is the smallest integer Amir could be thinking of?

Round within 1,000,000

Reasoning and problem solving

The difference between two 5-digit numbers is 200

When each number is rounded to the nearest 100,000, the difference between them is 100,000

What could the two numbers be?

Find all the possible answers.

49,900 and 50,100

49,800 and 50,000

328,154 people buy tickets for a festival.

Tickets are printed in batches of 10,000

How many batches of tickets should the organisers print?

33 batches

A, B and C are three different whole numbers.

- When the difference between A and B is rounded to the nearest 100, the answer is 700

- When the difference between B and C is rounded to the nearest 100, the answer is 400

- None of the numbers are multiples of 10

Find a possible set of values for A, B and C.

Compare answers with a partner.

Are your values of A, B and C in the same order greatest to smallest?

Are your differences smaller or greater?

A – B (or B – A) is between 650 and 749

B – C (or C –B) is between 350 and 449

multiple possible answers, e.g.

A = 1,199
B = 450
C = 1

A = 651
B = 1
C = 351