

Autumn  
Scheme of learning

**Year 4**

**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.

An abstract representation of the addition problem 5 + 7. The equation  $5 + 7$  is written inside a yellow rectangular box.

If you have questions about this approach and would like to consider appropriate CPD, please visit [www.whiterosemaths.com](http://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

**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

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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.

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

## Numbers to 20

**Key learning**

- Complete the number tracks.
  - 0 1 2
  - 10 11 12
  - 7 8 13
- 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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Activity symbols that indicate an idea can be explored practically

**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 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

No

Mo is counting in hundreds.

... 8 hundred, 9 hundred, 10 hundred

Mo

How should Mo have said the last number?

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

Dora will say the number 160

Tiny

Is Tiny correct? How do you know?

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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Answers provided where appropriate



# Activities and symbols

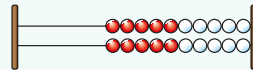
## Key Stage 1 activities

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.

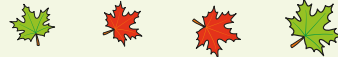


Ask children to show a number on their Rekenrek.

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.

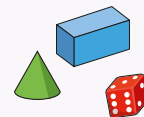


An investigation



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



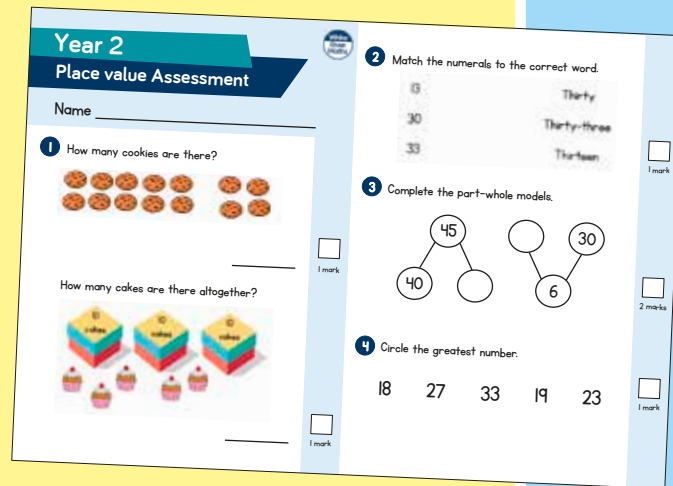
children talk about and compare their answers and reasoning



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.


# Free supporting materials


**End-of-block assessments** to check progress and identify gaps in knowledge and understanding.



**Year 2**  
**Place value Assessment**

Name \_\_\_\_\_

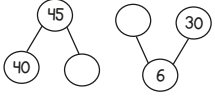
1 How many cookies are there?  
  
\_\_\_\_\_ 1 mark

How many cakes are there altogether?  
  
\_\_\_\_\_ 1 mark

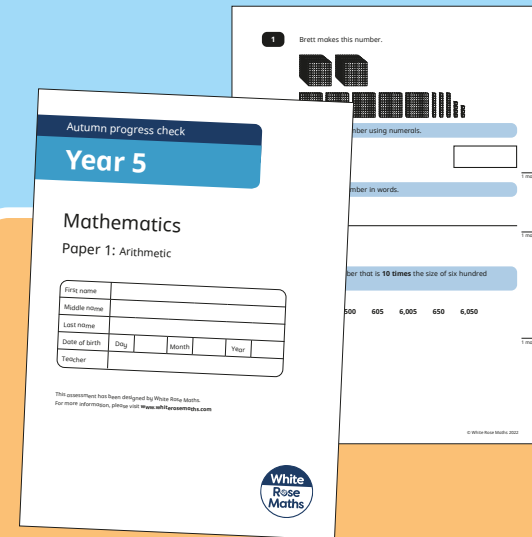
2 Match the numerals to the correct word.  

13	Thirty
30	Thirty-three
33	Thirteen

  
\_\_\_\_\_ 1 mark

3 Complete the part-whole models.  
  
\_\_\_\_\_ 2 marks

4 Circle the greatest number.  
18   27   33   19   23  
\_\_\_\_\_ 1 mark



Autumn progress check  
**Year 5**  
**Mathematics**  
Paper 1: Arithmetic

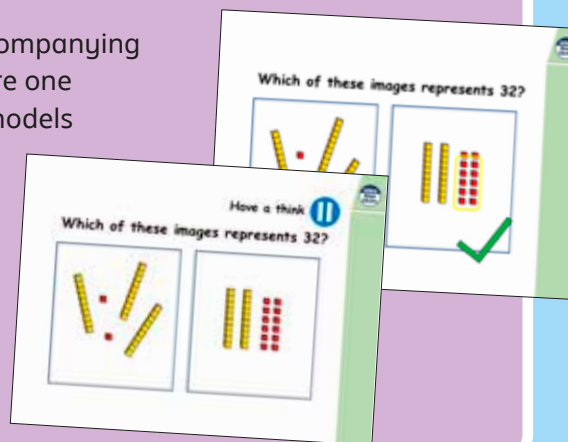
First name			
Middle name			
Last name			
Date of birth	Day	Month	Year
Teacher			


This assessment has been designed by White Rose Maths.  
For more information, please visit [www.whiterosemaths.com](http://www.whiterosemaths.com)


White Rose Maths

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

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.



Which of these images represents 32?  


Have a think  
Which of these images represents 32?  


# Free supporting materials

Primary Progression – Place Value						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Place Value: Counting</b>	<ul style="list-style-type: none"> <li>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</li> <li>Count numbers to 100 in numerals; count in multiples of twos, fives and tens</li> </ul> <p>Autumn 1 Autumn 4 Spring 2 Summer 4</p>	<ul style="list-style-type: none"> <li>count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward</li> </ul> <p>Autumn 1</p>	<ul style="list-style-type: none"> <li>count from 0 in multiples of 4, 8, 50 and 100, find 10 or 100 more or less than a given number</li> </ul> <p>Autumn 1 Autumn 3</p>	<ul style="list-style-type: none"> <li>count in multiples of 6, 7, 9, 25 and 1000</li> <li>count backwards through zero to include negative numbers</li> </ul> <p>Autumn 1 Autumn 4</p>	<ul style="list-style-type: none"> <li>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</li> <li>count forwards and backwards with positive and negative whole numbers, including through zero</li> </ul> <p>Autumn 1</p>	

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

**Skill: Add three 1-digit numbers**

Year: 2

When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

$7 + 6 + 3 = 16$

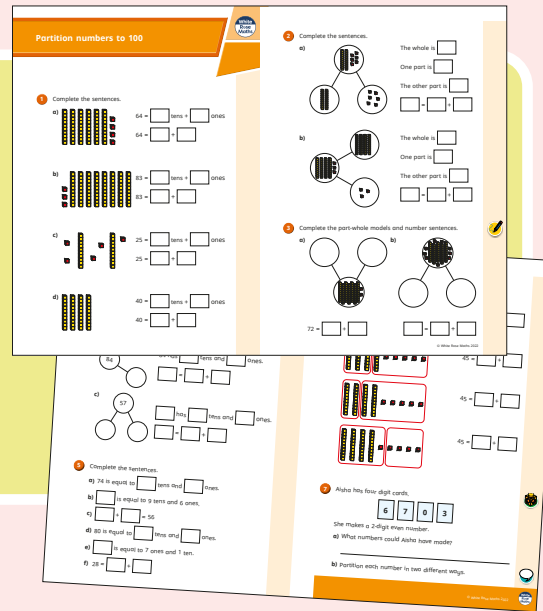
**Calculation policies** that show how key approaches develop from Year 1 to Year 6.

Ready to Progress – Number Facts Year 3			
	3NF-1	3NF-2	3NF-3
<b>RTP Criteria</b>	Secure fluency in addition and subtraction facts that bridge 10, through continued practice.	Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.	Apply place-value knowledge to know additive and multiplicative number facts (scaling facts by 10).
<b>White Rose Maths Small Steps</b>	<b>Autumn 2 Addition and Subtraction</b> <ul style="list-style-type: none"> <li>Add 3-digit and 1-digit numbers - crossing 10</li> <li>Subtract a 1-digit number from a 3-digit number - crossing 10</li> <li>Add 3-digit and 2-digit numbers - crossing 100</li> <li>Subtract a 2-digit number from a 3-digit number - crossing 100</li> </ul>	<b>Autumn 3 Multiplication and Division</b> <ul style="list-style-type: none"> <li>2 times-table</li> <li>5 times-table</li> <li>Divide by 2</li> <li>Divide by 5</li> <li>Divide by 10</li> <li>Multiply by 4</li> <li>Divide by 4</li> <li>The 4 times-table</li> <li>Multiply by 8</li> <li>Divide by 8</li> <li>The 8 times-table</li> </ul>	<b>Spring 1 Multiplication and Division</b> <ul style="list-style-type: none"> <li>Related calculations</li> <li>Scaling</li> </ul> <b>Spring 4 Measurement: Length and Perimeter</b> <ul style="list-style-type: none"> <li>Equivalent lengths (m and cm)</li> <li>Equivalent lengths (mm and cm)</li> </ul>

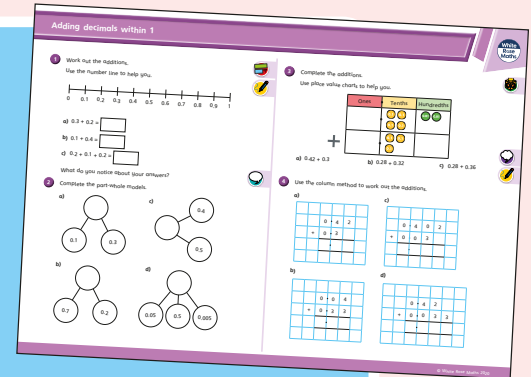
**Ready to progress** mapping that shows how the schemes of learning link to curriculum prioritisation.

# Premium supporting materials

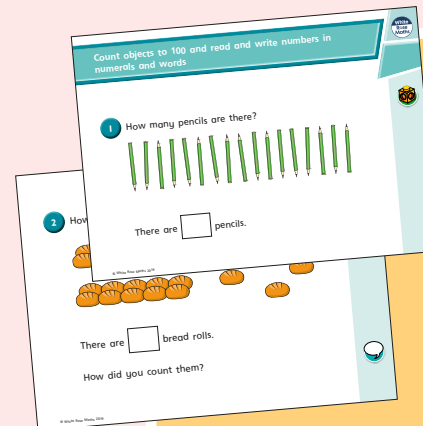
**Worksheets** to accompany every small step, providing relevant practice questions for each topic that will reinforce learning at every stage.



**Display** versions of the worksheet questions for front of class/whole class teaching.

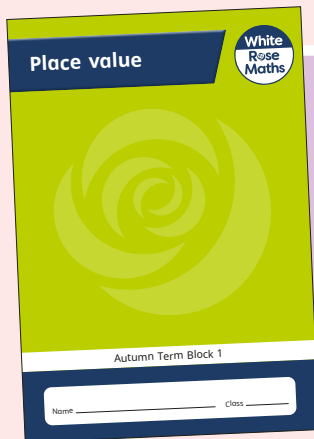


**PowerPoint™** versions of the worksheet questions to incorporate them into lesson planning.



**Answers** to all the worksheet questions.

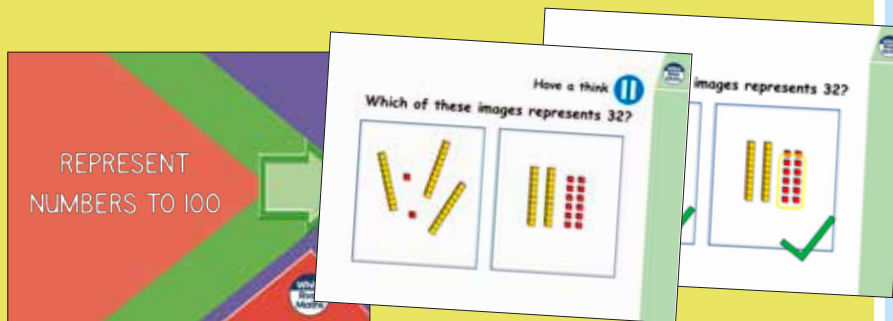
Question	Answer
1	There are 17 pencils.
2	There are 17 bread rolls. Children may have counted 3 tens and 5 rolls.
3	twenty-eight
4	sixty-two
5	4 tens and 5 ones
6	a) seventeen b) twenty-one c) thirty-five d) eighty-two
7	a) 12 b) 80 c) 100 d) 9 e) 27 f) 14
8	79, 80, 81, 82, 83, 85 70, 79, 66, 64, 63
9	Eric has 20 sweets. Ed's friend gives her 7 sweets.



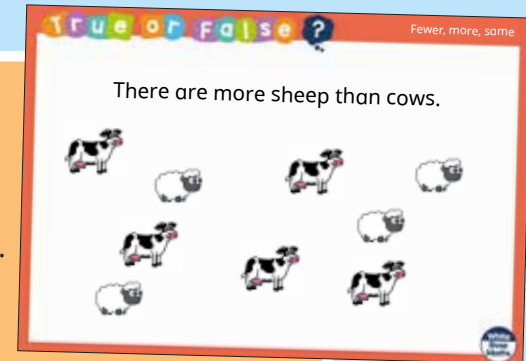
Also available as printed **workbooks**, per block.

# 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.



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.



**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

- 1) Round 6,495 to the nearest 10, 100 and 1,000  $5 \times 2$   
6,500 6,500 6,000
- 2) Round 38 to the nearest 10 40
- 3) Complete the part-whole model.
- 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.

## 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.

White  
Rose  
Maths





# 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 <b>Place value</b>				Number <b>Addition and subtraction</b>			Measurement <b>Area</b>	Number <b>Multiplication and division A</b>			Consolidation
Spring	Number <b>Multiplication and division B</b>			Measurement <b>Length and perimeter</b>		Number <b>Fractions</b>			Number <b>Decimals A</b>			
Summer	Number <b>Decimals B</b>	Measurement <b>Money</b>		Measurement <b>Time</b>		Consolidation	Geometry <b>Shape</b>		Statistics	Geometry <b>Position and direction</b>		

Autumn Block 1

**Place value**



## Small steps

Step 1

Represent numbers to 1,000

Step 2

Partition numbers to 1,000

Step 3

Number line to 1,000

Step 4

Thousands

Step 5

Represent numbers to 10,000

Step 6

Partition numbers to 10,000

Step 7

Flexible partitioning of numbers to 10,000

Step 8

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

## Small steps

Step 9

Number line to 10,000

Step 10

Estimate on a number line to 10,000

Step 11

Compare numbers to 10,000

Step 12

Order numbers to 10,000

Step 13

Roman numerals

Step 14

Round to the nearest 10

Step 15

Round to the nearest 100

Step 16

Round to the nearest 1,000

## Small steps

Step 17

Round to the nearest 10, 100 or 1,000

# Represent numbers to 1,000

## Notes and guidance

Children learned how to represent numbers to 1,000 in Year 3 – a concept that will be reinforced in this small step to ensure they have a sound understanding. This understanding will be important later in the block, as children begin to explore numbers over 1,000

Examples have been chosen to ensure that children look at representing and interpreting numbers that have no tens or no ones, to reinforce the idea of using zero as a placeholder. Base 10 and place value counters are used throughout. Base 10 can help children understand the size of a number, while place value counters are more efficient later in the block, when working with 4-digit numbers.

### Things to look out for

- Children may write numbers incorrectly, for example 421 as 400201
- Children may not understand the place value of each digit in a number.
- Children may not use placeholders appropriately.
- Children may not recognise the value of a place value counter correctly, because different place value counters are identical in size.

## Key questions

- What is the value of each base 10 piece?
- What is the value of each place value counter?
- How did you count the pieces?
- Does the order in which you build the number matter?
- Can you represent the number another way?
- What do you do if there are no tens?

## Possible sentence stems

- There are \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.  
The number is \_\_\_\_\_
- When a number has no \_\_\_\_\_, then we use \_\_\_\_\_ as a placeholder.

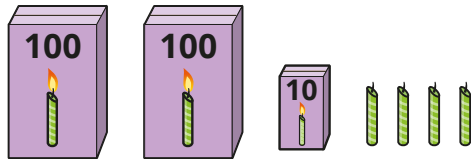
### National Curriculum links

- Read and write numbers up to 1,000 in numerals and words (Y3)
- Identify, represent and estimate numbers using different representations

# Represent numbers to 1,000

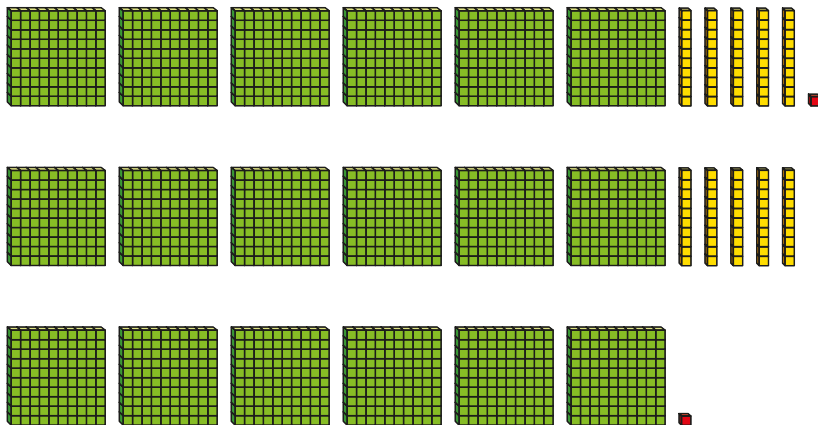
## Key learning

- How many candles are there?



Write your answer in numerals and words.

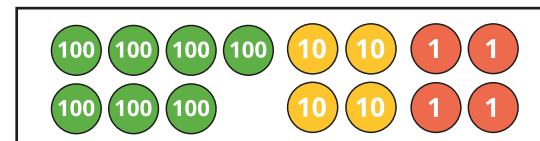
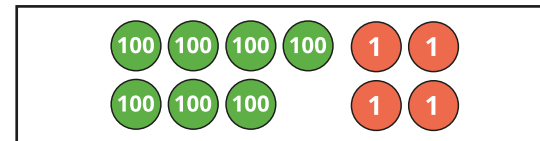
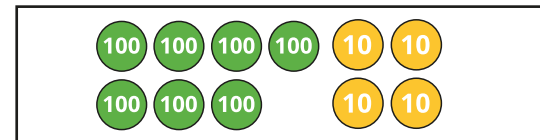
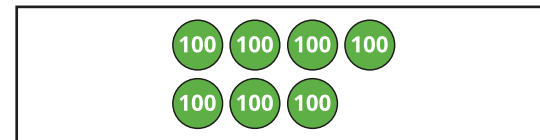
- What numbers are represented?



- Use base 10 to represent each number.



- What numbers are represented?



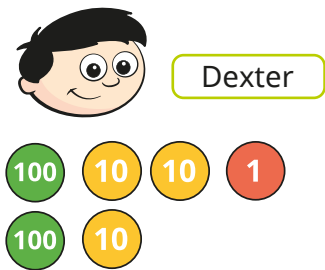
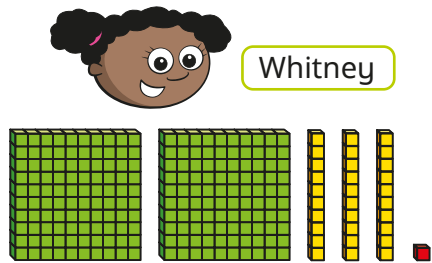
- Annie is drawing place value counters to represent 516. Complete her drawing.



# Represent numbers to 1,000

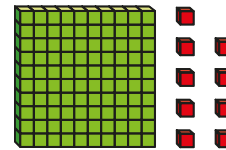
## Reasoning and problem solving

Whitney and Dexter have each made a number.



Whitney and Dexter have both made the number 231

What numbers have they made?  
 What is the same about their numbers?  
 What is different?



This is the number 19

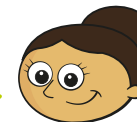
What mistake has Ron made?  
 What is the number?

Ron has mistaken 100 for 10, and not used placeholders correctly.

109



This is the number 421



What mistake has Dora made?  
 What is the number?

Dora has not used the place value of each counter correctly.

142

# Partition numbers to 1,000

## Notes and guidance

In this small step, children partition numbers up to 1,000 into hundreds, tens and ones.

Children represent numbers in a part-whole model and identify missing parts and wholes. They write numbers in expanded form, using the part-whole model as support where needed, and identify the number of hundreds, tens and ones in a 3-digit number. Particular attention should be paid to numbers that include zero as a placeholder, to build on learning from the previous step.

Base 10 and place value counters can continue to be used to support children's understanding.

### Things to look out for

- Children may not correctly assign place value to each digit of a number. For example, they may write  $423 = 4 + 2 + 3$
- Children may not recognise a number represented by a part-whole model, where the parts are not given in value order.
- Children may say that 423 has 20 tens rather than 2 tens, because they confuse place value language.

## Key questions

- How many hundreds/tens/ones are there in 465?
- How do you write a number that has zero tens?
- How do you write a number that has zero ones?
- What number is equal to  $300 + 70 + 9$ ?
- What is the value of the missing part? How do you know?
- What is the value of the digit \_\_\_\_\_ in the number \_\_\_\_\_?

## Possible sentence stems

- \_\_\_\_\_ has \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.  
\_\_\_\_\_ = \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_
- The number that is made up of \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones is \_\_\_\_\_

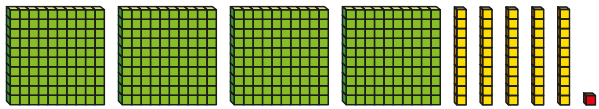
### National Curriculum links

- Identify, represent and estimate numbers using different representations
- Recognise the place value of each digit in a 3-digit number (hundreds, tens, ones) (Y3)

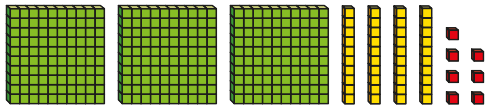
# Partition numbers to 1,000

## Key learning

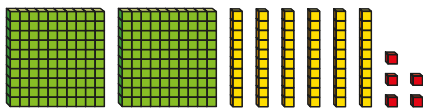
- Use the base 10 to help you complete the number sentences.



$$451 = 400 + \underline{\quad} + \underline{\quad}$$



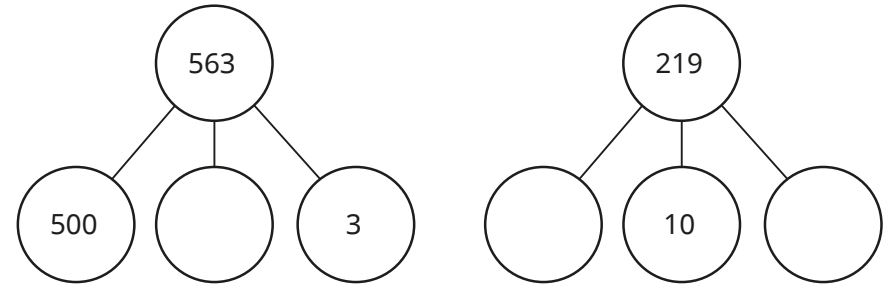
$$347 = \underline{\quad} + \underline{\quad} + \underline{\quad}$$



$$265 = \underline{\quad} + \underline{\quad} + \underline{\quad}$$

- Complete the number sentences.
  - ▶  $982 = \underline{\quad} + \underline{\quad} + \underline{\quad}$
  - ▶  $980 = \underline{\quad} + \underline{\quad}$
  - ▶  $902 = \underline{\quad} + \underline{\quad}$

- Complete the part-whole models.

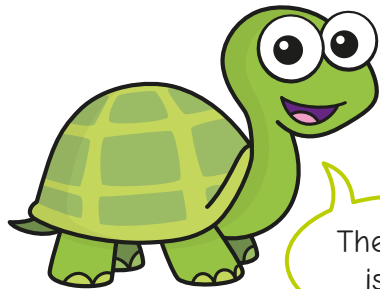
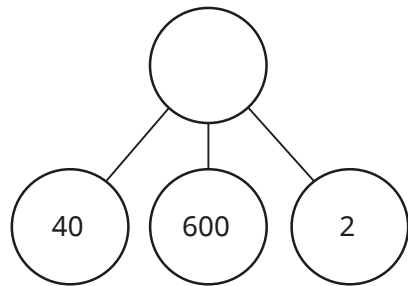


- Complete the sentences.
  - ▶ 259 has \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.
  - ▶ 813 has 8 \_\_\_\_\_, 1 \_\_\_\_\_ and 3 \_\_\_\_\_
  - ▶ 106 has \_\_\_\_\_ hundred, \_\_\_\_\_ tens and \_\_\_\_\_ ones.
  - ▶ \_\_\_\_\_ has 5 hundreds, 1 ten and 0 ones.
- How many hundreds does the number 907 have?  
How many ones does the number 36 have?  
How many tens does the number 680 have?
- Write in numerals the number that has 7 hundreds, 1 one and 2 tens.



# Partition numbers to 1,000

## Reasoning and problem solving



The whole is 462

Tiny has not recognised that the parts are not in order.

642

Explain the mistake that Tiny has made.

What is the whole?

Dexter is thinking of a number.

My number is a 3-digit number.



It has the same number of tens as ones.

The digit sum is 10

$$244 = 200 + 40 + 4$$

$$433 = 400 + 30 + 3$$

$$622 = 600 + 20 + 2$$

$$811 = 800 + 10 + 1$$

What could Dexter's number be?

Find each possibility and partition it.

# Number line to 1,000

## Notes and guidance

In this small step, children revisit the number line to 1,000, which they were first introduced to in Year 3

Children label, identify and find missing values on blank or partially completed number lines. Using real-life scales, such as rulers and measuring jugs, can be helpful here.

When looking at partially completed number lines, it is important that children become confident in finding the difference between the start and end points and dividing to find the value of each interval. Explicit examples should be used that have a varying number of intervals and unmarked values in different positions.

Children also learn how to work out the value at the midpoint of an interval.

### Things to look out for

- Children may count the number of divisions, rather than the intervals.
- Support may be needed to work out the midpoint of an interval.
- Children may assume the increments on the number line are each worth one unit, focusing solely on the starting number.

## Key questions

- What are the values at the start and end points of the number line?
- What is the difference in value between the start and end points?
- How many intervals are there?
- How can you work out what each interval is worth?
- How can you work out the halfway point of an interval?
- What other numbers can you mark on the number line?
- Why are the start and end values of a number line important?

## Possible sentence stems

- The difference in value between the start and end of the number line is \_\_\_\_\_
- There are \_\_\_\_\_ intervals. Each interval is worth \_\_\_\_\_

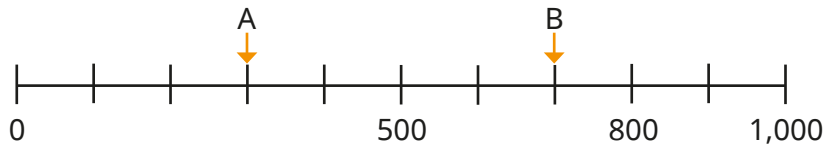
## National Curriculum links

- Identify, represent and estimate numbers using different representations

# Number line to 1,000

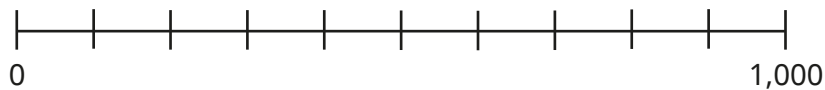
## Key learning

- What numbers are the arrows pointing to?



- Complete the sentences for each number line.

Label the number lines.

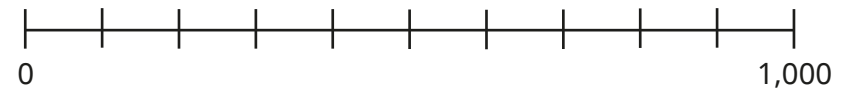


The difference in value between the start and the end of the number line is \_\_\_\_\_

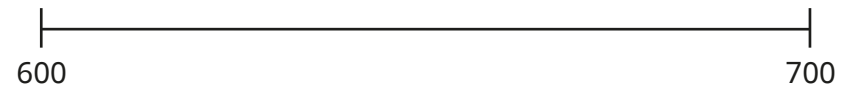
There are \_\_\_\_\_ intervals.

\_\_\_\_\_ ÷ \_\_\_\_\_ = \_\_\_\_\_

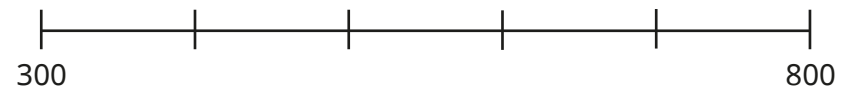
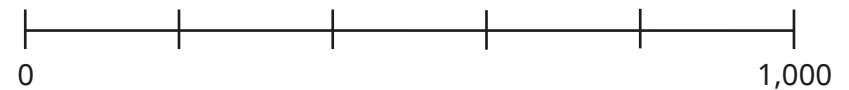
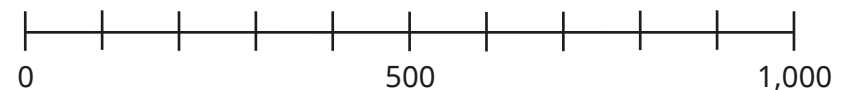
- Label 200 and 750 on the number line.



- Label 680 on the number line.



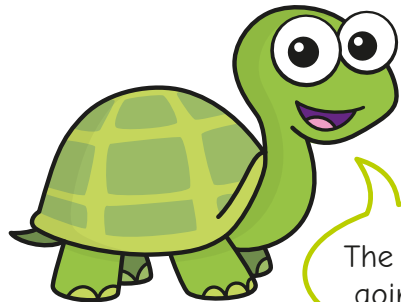
- Draw an arrow to show the position of 550 on each number line.



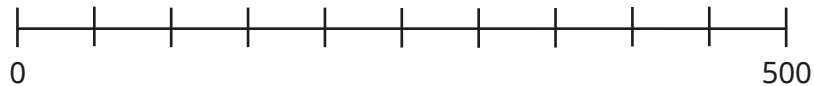
What do you notice?

# Number line to 1,000

## Reasoning and problem solving



The number line is going up in 100s.



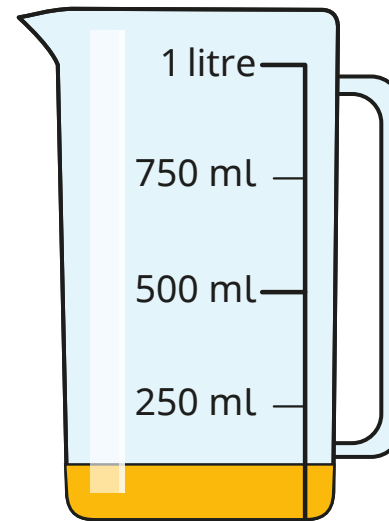
Do you agree with Tiny?

Talk about your answer with a partner.



No

Filip has poured some juice from a jug.



approximately 125 ml

Estimate how much juice is left in the jug.

# Thousands

## Notes and guidance

Building on previous steps where children explored numbers up to 1,000, they now explore numbers beyond 1,000

The initial focus of this small step is counting in 1,000s forwards and backwards from any given multiple of 1,000. Number tracks can be used to support this.

Children then look at the composition of multiples of 1,000 by exploring how many hundreds they are made of. They unitise the hundred, being able to state the number of hundreds that make up any 4-digit multiple of 100 or 1,000 such as “20 hundreds are equal to 2,000”

Base 10 and place value counters in a ten frame are helpful when identifying the connection between the number of hundreds that are equal to a multiple of a thousand.

## Things to look out for

- Children may not appreciate that 1,000 is 10 times the size of 100
- When they are meant to be counting in 1,000s, children may count in the more familiar 100s.
- Children may not use placeholders appropriately.

## Key questions

- Counting in 1,000s from 3,000, what is the next number?
- Counting back in 1,000s from 7,000, tell me a number you would say. How do you know?
- How many thousands are there in 6,000?
- How many hundreds are there in 1,000?
- How many hundreds are there in 6,000?

## Possible sentence stems

- The next multiple of 1,000 is \_\_\_\_\_
- The previous multiple of 1,000 is \_\_\_\_\_
- 1 thousand is equal to \_\_\_\_\_ hundreds, so \_\_\_\_\_ thousands is equal to \_\_\_\_\_ hundreds.
- \_\_\_\_\_ thousands can be written in numerals as \_\_\_\_\_

## National Curriculum links

- Count in multiples of 6, 7, 9, 25 and 1,000

# Thousands

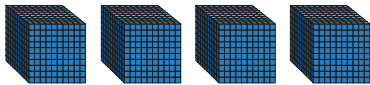
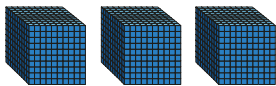
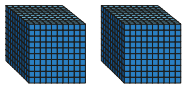
## Key learning

- How many nails are there?



Write your answer in numerals and words.

- What numbers are represented?



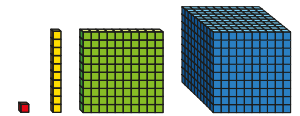
- Complete the number tracks.

1,000	2,000			
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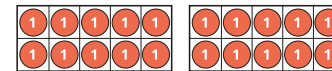
		7,000	8,000	9,000
--	--	-------	-------	-------

- Complete the sentences.

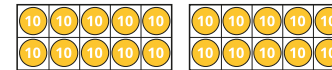
- There are \_\_\_\_\_ ones in a thousand.
- There are \_\_\_\_\_ hundreds in a thousand.
- There are \_\_\_\_\_ tens in a thousand.



- Complete the sentences to match the ten frames.



\_\_\_\_\_ ones = \_\_\_\_\_ tens



\_\_\_\_\_ tens = \_\_\_\_\_ hundreds



\_\_\_\_\_ hundreds = \_\_\_\_\_ thousands

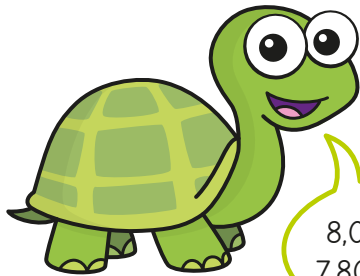
- Complete the sentences.

- 3 thousand = 3,000  
There are \_\_\_\_\_ hundreds in 3 thousand.
- \_\_\_\_\_ thousand = 5,000  
There are 50 hundreds in \_\_\_\_\_ thousand.

# Thousands

## Reasoning and problem solving

Tiny is counting back in 1,000s from 8,000



8,000, 7,900,  
7,800, 7,700 ...

What mistake has Tiny made?

Tiny has counted back in 100s, not 1,000s.

Tiny should say, "8,000, 7,000, 6,000 ..."

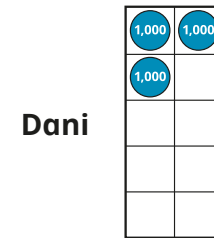
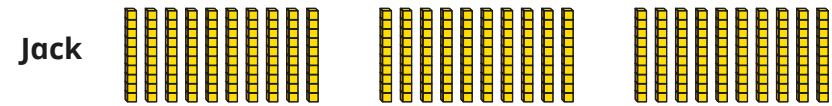
Is the statement true or false?



When counting in 1,000s, the numbers will always have four digits.

False

Jack, Huan and Dani are asked to represent 3,000



Who do you agree with?  
Explain your answer.



Huan and Dani

# Represent numbers to 10,000

## Notes and guidance

Building on earlier work, where children looked at numbers to 1,000, this small step focuses on representing numbers to 10,000

Children use different representations such as place value charts and Gattegno charts, which highlight the place value of the digits in the numbers. It is important that children explore the relationship “both ways” between the place value columns, for example, 100 is 10 times the size of 10 and a tenth the size of 1,000

It may be helpful to discuss with children how and why we use a comma when writing numbers, as it can help with reading and writing larger numbers.

Children should experience questions that include zero as a placeholder to represent a blank column in a place value chart.

### Things to look out for

- Numbers may be written incorrectly, for example 2,342 as 2000300402
- When using blank counters on a place value chart, children may not make the connection between the column and the value of the counter.
- Children may forget to use zero as a placeholder.

## Key questions

- What number is represented?
- What is the value of each digit?
- Represent 4,672 using base 10/place value counters. How many thousands, hundreds, tens and ones are in the number?
- How would you represent  $6,000 + 0 + 60 + 9$  in the place value chart?
- How do you know the counter in the thousands column has a greater value than the counter in the ones column?

## Possible sentence stems

- There are \_\_\_\_\_ thousands, \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.

The number is \_\_\_\_\_

## National Curriculum links

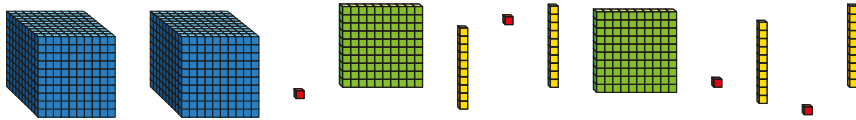
- Recognise the place value of each digit in a 4-digit number (thousands, hundreds, tens and ones)
- Identify, represent and estimate numbers using different representations



# Represent numbers to 10,000

## Key learning

- Complete the sentences.



There are \_\_\_\_\_ thousands, \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.

The number is \_\_\_\_\_

- Use base 10 to represent each number.



- Complete the sentences.

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

There are \_\_\_\_\_ thousands, \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.

The number is \_\_\_\_\_

- What numbers are represented on the place value charts?

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

Write your answers in words and numerals.

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

- Use plain counters to represent each number on a place value chart.



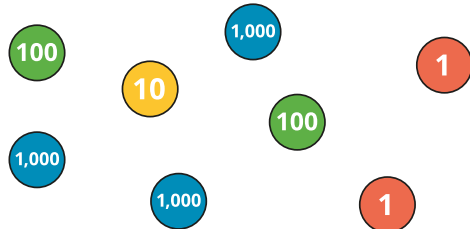
- Complete the Gattegno chart to represent the number 5,326

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

# Represent numbers to 10,000

## Reasoning and problem solving

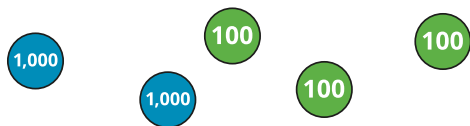
Aisha is making 3,512 with place value counters.



What other place value counters could she add to make 3,512?

multiple possible answers, e.g.  
3 hundreds  
2 hundreds and 10 tens  
300 ones

Jack has two 1,000 counters and three 100 counters.

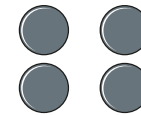


What 4-digit numbers can he make?

2,300, 2,200,  
2,100, 2,000,  
1,300, 1,200,  
1,100, 1,000

Use exactly four counters to make as many 4-digit numbers as possible.

Write each number in numerals.



Th	H	T	O

4,000, 3,100,  
3,010, 3,001,  
2,200, 2,020,  
2,002, 2,110,  
2,101, 2,011,  
1,300, 1,030,  
1,003, 1,210,  
1,201, 1,120,  
1,102, 1,111

# Partition numbers to 10,000

## Notes and guidance

The focus of this small step is to ensure that children have a secure understanding of place value with 4-digit numbers.

Children partition a number up to 10,000 by identifying the number of thousands, hundreds, tens and ones. They should give their answers using numerals, words and expanded form, for example  $5,346 = 5 \text{ thousands, } 3 \text{ hundreds, } 4 \text{ tens and } 6 \text{ ones}$  or  $5,000 + 300 + 40 + 6$

The familiar representations used earlier in the block can help children to understand the value of each digit. A part-whole model can also support children in partitioning numbers.

Children should experience questions that include zero as a placeholder, so they understand this cannot be omitted, minimising the misconception that  $5,006 = 56$

## Things to look out for

- Children may not associate the digits with their value and just write, for example,  $7,645 = 7 + 6 + 4 + 5$
- Partitioned numbers that are presented “out of order” may lead to errors, for example  $7,000 + 3 + 20 + 700 = 7,327$
- Children may omit zero as a placeholder.

## Key questions

- What number is represented?
- How many thousands/hundreds/tens/ones are there in the number \_\_\_\_\_?
- What is the value of each digit in 4,715?
- Does the order in which you partition the number matter?
- What number is equal to  $7,000 + 0 + 30 + 4$ ?
- What does a zero in a place value column tell you?

## Possible sentence stems

- \_\_\_\_\_ has \_\_\_\_\_ thousands, \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.  
\_\_\_\_\_ = \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

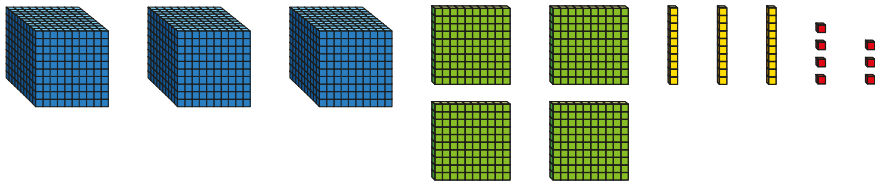
## National Curriculum links

- Recognise the place value of each digit in a 4-digit number (thousands, hundreds, tens and ones)
- Identify, represent and estimate numbers using different representations

# Partition numbers to 10,000

## Key learning

- Complete the number sentence.



$$3,437 = 3,000 + \underline{\quad} + \underline{\quad} + \underline{\quad}$$

- Complete the number sentences.

Thousands	Hundreds	Tens	Ones

$$3,412 = \underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad}$$

Thousands	Hundreds	Tens	Ones

$$\underline{\quad} = \underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad}$$

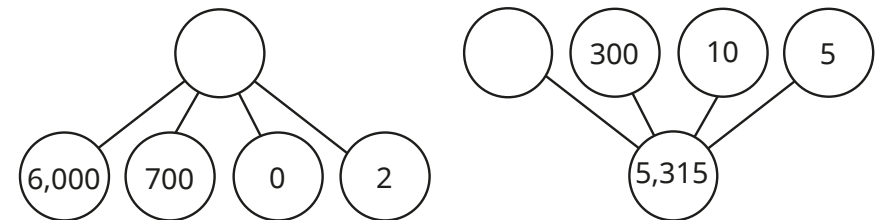
- Use the Gattegno chart to complete the number sentences.

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

There are \_\_\_\_\_ thousands, \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.

The number is \_\_\_\_\_

- Complete the part-whole models.



- Complete the sentences.

- ▶ 7,812 is equal to \_\_\_\_\_ thousands, \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.
- ▶ \_\_\_\_\_ is equal to 3 thousands, 4 hundreds, 0 tens and 9 ones.
- ▶ \_\_\_\_\_ = 8,000 + 40 + 3

# Partition numbers to 10,000

## Reasoning and problem solving



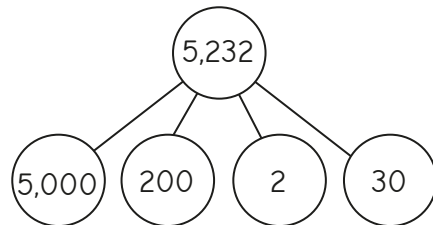
Tiny is partitioning 6,902

$$6,902 = 600 + 90 + 2$$

Explain the mistake Tiny has made.

Tiny has not assigned the correct value to each digit because there are no tens.

Tiny is partitioning the number 5,232 and representing it in a part-whole model.



Has Tiny partitioned the number correctly?

Explain your answer.

Yes  
The order of the parts does not matter, as long as they have the correct value.



I am thinking of a 4-digit number.

Use the clues to work out Tommy's number.

- The thousands digit is 3 greater than the tens digit.
- The total sum of digits is 16
- The 4-digit number is odd.
- The tens digit is 2
- The hundreds digit is double the ones digit.

Think of another 4-digit number and challenge a partner to work out your number from clues.

5,623

# Flexible partitioning of numbers to 10,000

## Notes and guidance

In this small step, children explore flexible partitioning of numbers up to 10,000, understanding that the whole number can be split into parts in many different ways.

Children use numerals, words and expanded form in their partitioning. A key focus should be appreciating that, for example,  $6,000 + 400 + 20 + 9 = 5,000 + 1,400 + 20 + 9$ , as this is crucial to understanding addition and subtraction of 4-digit numbers in future blocks.

The representations used in previous small steps can provide support, arranging place value counters or base 10 to appreciate that the different partitions give the same number. When working in adjacent columns in a place value chart, links should be made to exchanges as this will support learning in later blocks.

## Things to look out for

- Children may believe that 4-digit numbers can only be partitioned one way into thousands, hundreds, tens and ones.
- When identifying a number that has been partitioned in a non-standard way, children may just combine the digits rather than consider their place value, for example  $5,000 + 1,400 + 20 + 9 = 51,429$

## Key questions

- How can you write the number using a part-whole model?
- What different multiples of 1,000 could be the first part? How does this affect the values of the other parts?
- What can you exchange the thousands/hundreds/tens/ones digit for?
- How do you work out the whole, given the parts?

## Possible sentence stems

- \_\_\_\_\_ is equal to \_\_\_\_\_ thousands, \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones or \_\_\_\_\_ thousands, \_\_\_\_\_ hundreds, \_\_\_\_\_ tens and \_\_\_\_\_ ones.
- \_\_\_\_\_ = \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_  
or \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_

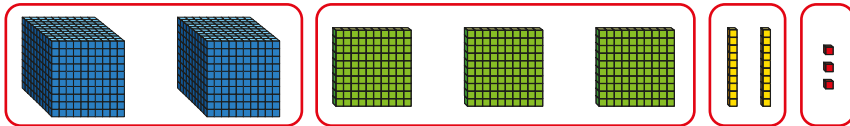
## National Curriculum links

- Recognise the place value of each digit in a 4-digit number (thousands, hundreds, tens and ones)
- Identify, represent and estimate numbers using different representations

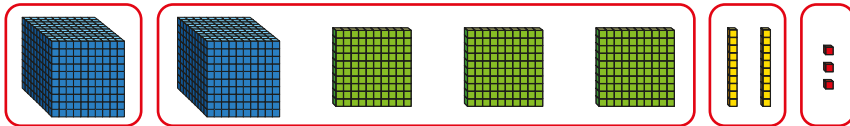
# Flexible partitioning of numbers to 10,000

## Key learning

- Complete the number sentences.



$$2,323 = 2,000 + \underline{\quad} + \underline{\quad} + \underline{\quad}$$



$$2,323 = \underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad}$$

How else can 2,323 be partitioned?

- Use the place value chart to complete the number sentences.

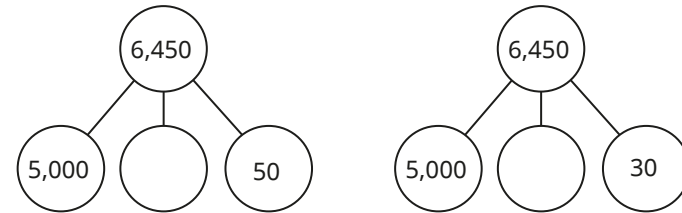
Thousands	Hundreds	Tens	Ones
1,000 1,000	100 100 100	10 10 10	1 1 1 1 1 1 1 1 1

$$2,339 = 2,000 + \underline{\quad} + 30 + 9$$

$$2,339 = 2,000 + 300 + \underline{\quad} + 19$$

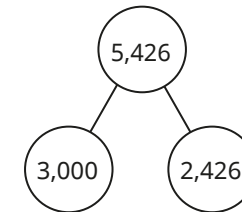
$$2,339 = 1,000 + \underline{\quad} + 30 + 9$$

- Complete the part-whole models.



What is the same and what is different?

- Here is one way of partitioning 5,426 into two parts.



Find three other ways of partitioning 5,426 into two parts.

Compare answers with a partner.

- Complete the number sentences.

▶  $8,432 = 7,000 + \underline{\quad} + 31$

▶  $6,729 = 3,000 + \underline{\quad} + 19 + \underline{\quad}$

▶  $9,310 = \underline{\quad} + 110 + \underline{\quad}$

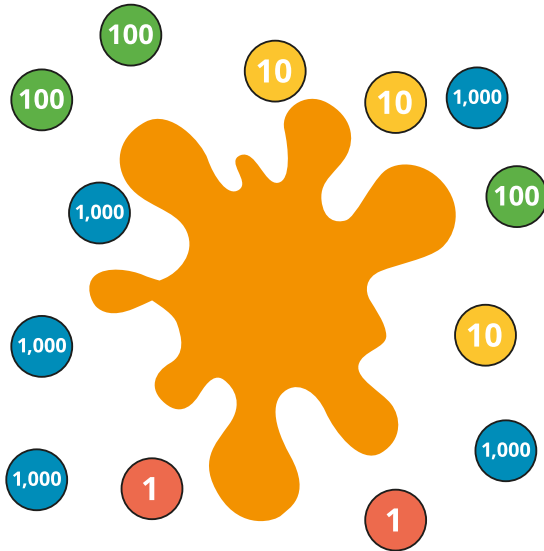
Is there more than one way of completing each sentence?

# Flexible partitioning of numbers to 10,000

## Reasoning and problem solving

Some place value counters are hidden.

The total is six thousand, four hundred and thirty-two.



Which place value counters could be hidden?

Find at least three solutions.

multiple possible answers, e.g.

- 1 thousand and 1 hundred
- 10 hundreds and 10 tens
- 11 hundreds

Which is the odd one out?

3,500	3 thousands + 50 tens
2 thousands + 15 hundreds	35 tens

35 tens = 350

Explain how you know.

Scott and Esther are each thinking of a number.

- Scott's number has 53 hundreds, 6 tens and 2 ones.
- Esther's number has 5 thousands, 36 tens and 1 one.

Scott

Who is thinking of the greater number?

How do you know?



## Find 1, 10, 100, 1,000 more or less

### Notes and guidance

In Year 3, children found 1, 10 and 100 more or less than a 3-digit number. In this small step, they find 1, 10, 100 and 1,000 more or less than a number with up to four digits.

Using base 10, place value counters and plain counters in a place value chart will support understanding, particularly when multiples of 10/100/1,000 are crossed. It is also important to explore examples that result in zero as a placeholder, as this concept needs regular reinforcing.

Draw attention to which place value columns change and which stay the same in each example. This allows children to generalise that, for example, when finding 100 more/less, the ones and tens never change, the hundreds always change and the thousands sometimes change.

### Things to look out for

- Calculations that cross a boundary may cause confusion.
- Children may need support with the use of zero as a placeholder.
- Children may think that when finding, for example, 100 less than a number, only the digit in the hundreds column will ever change.

### Key questions

- How many ones/tens/hundreds/thousands are in \_\_\_\_\_? How will the number change if you add an extra 1/10/100/1,000?
- Which column changes if you find 1,000 more/less than a number?
- Can finding 1/10/100 more/less change more than one column? When does this happen?
- Do you need to make an exchange?
- How can you find 100 less than 8,012? What exchange do you need to make?
- Which columns stay the same/change?

### Possible sentence stems

- There are \_\_\_\_\_ tens/hundreds/thousands in \_\_\_\_\_
- 1 more/less ten than \_\_\_\_\_ tens is \_\_\_\_\_ tens.
- \_\_\_\_\_ more/less than \_\_\_\_\_ is \_\_\_\_\_

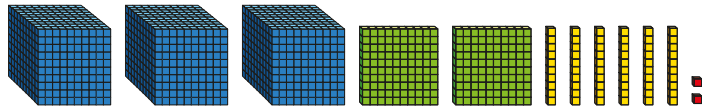
### National Curriculum links

- Find 1,000 more or less than a given number

# Find 1, 10, 100, 1,000 more or less

## Key learning

- Complete the sentences.



The number is \_\_\_\_\_

1 less than the number is \_\_\_\_\_

10 less than the number is \_\_\_\_\_

100 less than the number is \_\_\_\_\_

1,000 less than the number is \_\_\_\_\_

- Complete the sentences.

Thousands	Hundreds	Tens	Ones
1,000 1,000	100 100	10 10	1 1
1,000 1,000	100		1 1
1,000			1 1

The number is \_\_\_\_\_

1 more than the number is \_\_\_\_\_

10 more than the number is \_\_\_\_\_

100 more than the number is \_\_\_\_\_

1,000 more than the number is \_\_\_\_\_

- The place value chart shows that 100 more than 4,932 is 5,032

Thousands	Hundreds	Tens	Ones
1,000 1,000 1,000	100 100 100 100 100 100 100 100 100 100	10 10 10	1 1
1,000 1,000	100		

Use this method to find the values.

100 more than 3,904

10 more than 1,993

1 more than 8,999

- The place value chart shows that 10 less than 3,402 is 3,392

Thousands	Hundreds	Tens	Ones
1,000 1,000 1,000	100 100 100	10 10 10 10 10 10 10 10 10 <del>10</del>	1 1
	100		

Use this method to find the values.

100 less than 2,034

10 less than 1,903

# Find 1, 10, 100, 1,000 more or less

## Reasoning and problem solving

Are the statements always true, sometimes true or never true?



When you find 100 more or less than a number, the tens column changes.

When you find 10 more or less than a number, the tens column changes.

When you find 1 more or less than a number, the thousands column changes.

Explain your reasoning.



- never true
- always true
- sometimes true

Ron and Dora are thinking of different numbers.



1,000 more than Ron's number is 3,942

Dora's number is 100 more than Ron's number.

What are Ron and Dora's numbers?

Ron: 2,942  
Dora: 3,042



Tiny has put some counters on a place value chart.



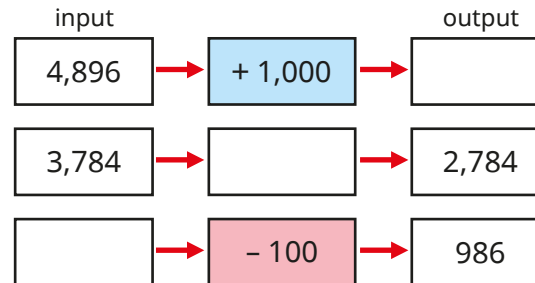
One counter has fallen off.

Th	H	T	O
●●●●		●●●●	●●●●

List all the possible numbers that Tiny could have started with.

- 6,043
- 5,143
- 5,053
- 5,044

Complete the function machines.



- 5,896
- 1,000
- 1,086

# Number line to 10,000

## Notes and guidance

Building on previous learning of number lines to 1,000, children now move on to look at number lines to 10,000

Children label, identify and find missing values on blank or partially completed number lines. Using real-life scales, such as rulers and measuring jugs, can be helpful here.

When looking at partially completed number lines, it is important children become confident in finding the difference between the start and end points and dividing to find the value of each interval. Examples should be used that have a varying number of intervals and unmarked values in different positions.

Children should also be able to work out the value at the midpoint of an interval.

### Things to look out for

- Children may count the number of divisions, rather than the intervals.
- Support may be needed to work out the midpoint of an interval.
- Children may assume the increments on the number line are each worth one unit, focusing solely on the starting number.

## Key questions

- What are the values at the start and end points of the number line?
- What is the difference in value between the start and end points?
- How many intervals are there?
- How can you work out what each interval is worth?
- How can you work out the halfway point of an interval?
- What other numbers can you mark on the number line?
- Why are the start and end values of a number line important?

## Possible sentence stems

- The difference in value between the start and end of the number line is \_\_\_\_\_
- There are \_\_\_\_\_ intervals. Each interval is worth \_\_\_\_\_

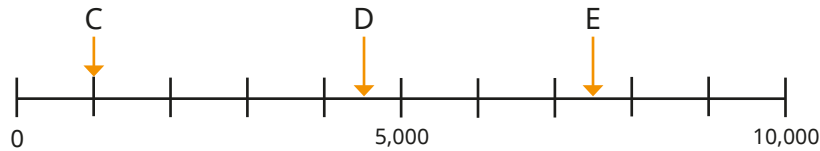
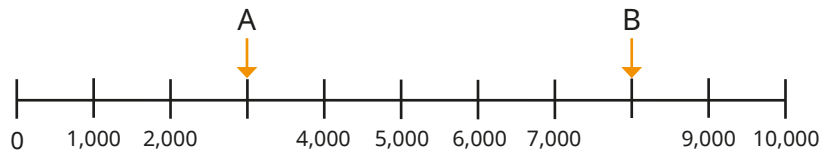
## National Curriculum links

- Identify, represent and estimate numbers using different representations
- Order and compare numbers beyond 1,000

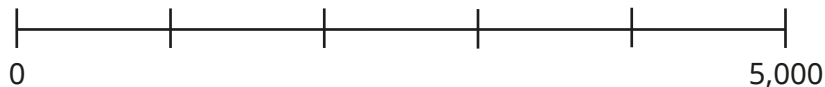
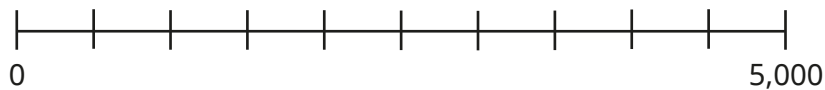
# Number line to 10,000

## Key learning

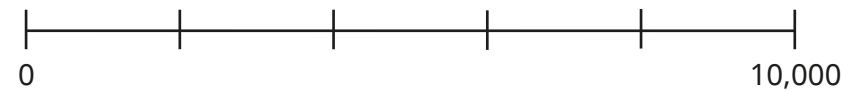
- What numbers are the arrows pointing to?



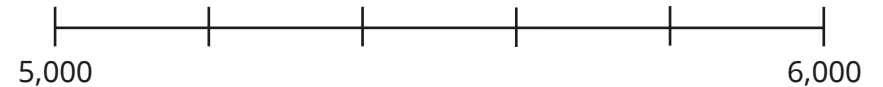
- Label the number lines.



- Mark the positions of the numbers on the number line.

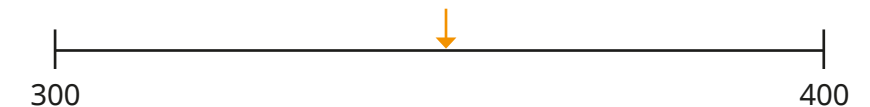


- Label 5,100 and three other numbers on the number line.



Compare answers with a partner.

- For each number line, estimate the number the arrow is pointing to.

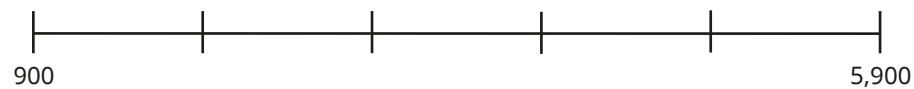
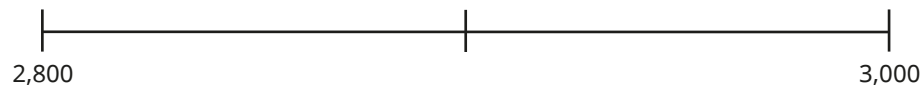
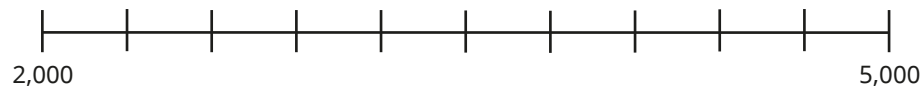


What do you notice?

# Number line to 10,000

## Reasoning and problem solving

Label 2,900 on each number line.



What do you notice?



Children should draw an arrow in the correct position on each number line.



Tiny is working out the missing values on a scale.



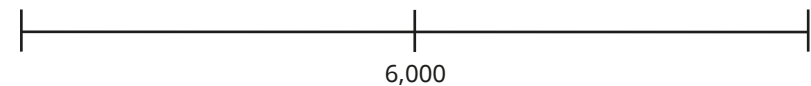
$$1,000 - 0 = 1,000$$

$$1,000 \div 6 = ?$$

Explain the mistake that Tiny has made.

There are 6 divisions, but only 5 intervals.  
Tiny needs to divide by 5

What could the start and end numbers be?



multiple possible answers, e.g. 5,000 and 7,000

# Estimate on a number line to 10,000

## Notes and guidance

In previous years, children explored estimating on number lines. In this small step, they estimate on number lines up to 10,000

Children discuss suitable estimates from the information given on the number line and the value of each interval, justifying their choices. Encourage children to identify the midpoint and to mark on additional points, for example one-quarter and three-quarters of the way along, to help them position the numbers.

It may be useful to consider the position of numbers relative to the midpoint of a number line, for example 6,429 is closer to 6,000 than 7,000 and it is less than halfway between the two points. This will be a useful skill later in the block when children look at rounding.

## Things to look out for

- Children may worry that they need to find the exact position or value.
- The scale may be misinterpreted, for example thinking a mark close to 10,000 is 9,999 when 9,000 would be more appropriate.

## Key questions

- What is the midpoint of the number line?
- How does knowing the midpoint help you to place the number on the number line?
- What other numbers could you mark on accurately?
- Which division is the arrow close to? Is the number greater than or less than this value?
- How would splitting the line into more intervals help?
- How accurate do you think your estimate is?

## Possible sentence stems

- The difference in value between the start and end of the number line is \_\_\_\_\_
- The midpoint of the number line is \_\_\_\_\_
- \_\_\_\_\_ is closer to \_\_\_\_\_ than \_\_\_\_\_

## National Curriculum links

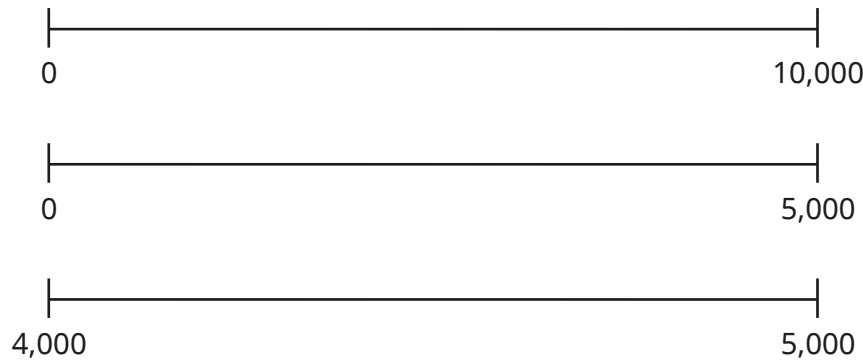
- Identify, represent and estimate numbers using different representations
- Order and compare numbers beyond 1,000

# Estimate on a number line to 10,000

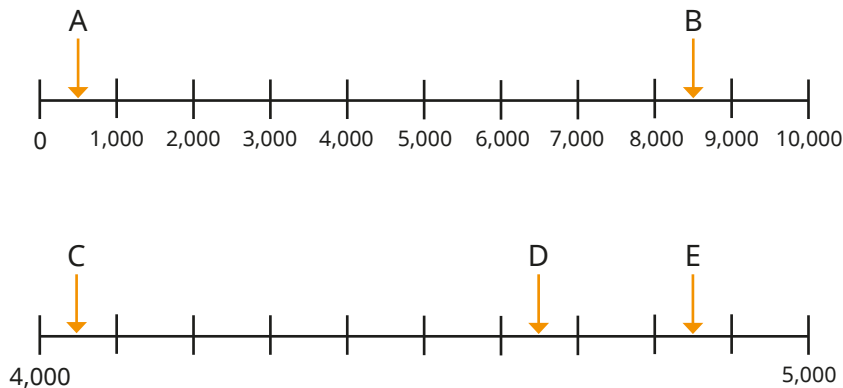
## Key learning

- Mark the midpoint of each number line.

What number does each midpoint represent?



- Estimate the numbers the arrows are pointing to.



- Alex and Dexter are marking 8,000 on the number line.

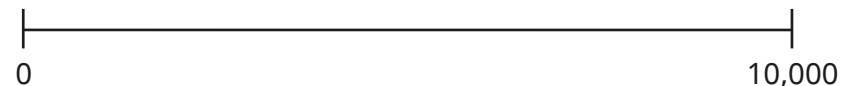
Alex and Dexter are shown with speech bubbles. Alex says, "I am going to mark halfway to help me." Dexter says, "I am going to split the number line into ten intervals." Below them are labels for Alex and Dexter.

Try each method.

Whose method did you find easier?

Which method do you think is more accurate?

- Draw arrows to show the approximate positions of the numbers on the number line.



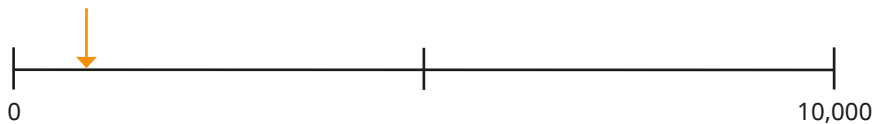
Compare methods with a partner.



# Estimate on a number line to 10,000

## Reasoning and problem solving

Mo and Teddy are estimating the number that the arrow is pointing to.



Mo

I estimate it is approximately 10



Teddy

I estimate it is approximately 1,000

Who do you agree with?

Explain your answer.

Teddy's estimate is more realistic. The midpoint is 5,000  
10 would be much closer to zero.

Miss Rose has spilt some paint on the number line.



Estimate three numbers that could appear under the paint.

Explain your answers.



numbers between 3,000 and 7,500



- C is greater than A.
- C is less than half of B.

Give three possible values for C.

e.g. A = 1,500 B = 9,000 C = between 1,500 and 4,500

# Compare numbers to 10,000

## Notes and guidance

This small step focuses on comparing numbers up to 10,000 using language such as greater/smaller than, less/more than. Once they are confident with the language used for comparisons, children progress to using the inequality symbols,  $<$ ,  $>$  and  $=$ , which they have encountered in previous years.

Representations such as base 10, place value counters and charts, and number lines support children's understanding of place value, allowing them to compare numbers visually before moving on to more abstract forms.

Demonstrate to children that when comparing numbers, they need to start with the greatest place value. If the digit in the greatest place value is the same, they need to look at columns to the right until they find different digits.

## Things to look out for

- When comparing numbers, children may compare the smallest place value first.
- Children may interpret the inequality symbols incorrectly, confusing  $<$  and  $>$
- Children may be confused by numbers with a different number of digits or numbers that contain placeholders.

## Key questions

- What is the value of the first digit in \_\_\_\_\_?
- What is the value of the \_\_\_\_\_ digit in \_\_\_\_\_?
- How many thousands/hundreds/tens/ones are there?
- Which column do you start comparing from?
- Which digit in each number has the greatest value?  
What is the value of these digits?
- When comparing two numbers, if the first digits are equal in value, what do you look at next?
- Which is the greater number? How do you know?

## Possible sentence stems

- If the digits in the \_\_\_\_\_ column are the same, I need to look in the \_\_\_\_\_ column.
- \_\_\_\_\_ is greater than \_\_\_\_\_ because ...
- \_\_\_\_\_ is less than \_\_\_\_\_ because ...

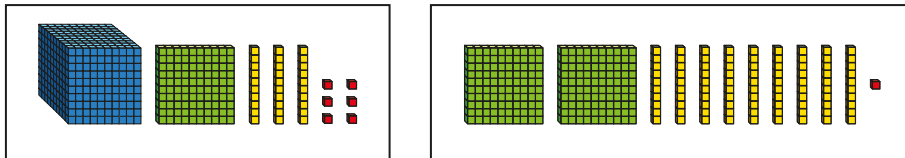
## National Curriculum links

- Order and compare numbers beyond 1,000

# Compare numbers to 10,000

## Key learning

- Which is the greater number? How do you know?



Complete the sentences.

\_\_\_\_\_ is less than \_\_\_\_\_

\_\_\_\_\_ is greater than \_\_\_\_\_

- Write  $<$ ,  $>$  or  $=$  to compare the numbers.

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

○

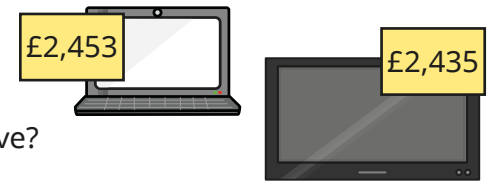
Th	H	T	O
1,000 1,000 1,000	100		1 1

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

○

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

- A laptop costs £2,453  
A TV costs £2,435



Which item is more expensive?

- Complete the statements.

Th	H	T	O
8	0	3	4
8	0	2	9

8,034 is \_\_\_\_\_ than 8,029

8,029 ○ 8,034

- Write  $<$ ,  $>$  or  $=$  to compare the numbers.

321 g ○ 3,012 g

7,000 m ○ 4,629 m

98 ○ 1,032

£5,612 ○ £5,628

3,402 ○ 1,897

4,002 ○ 865

4,283 ○ 4,238

1,902 ○ 1,920

# Compare numbers to 10,000

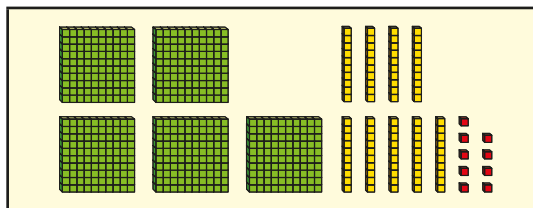
## Reasoning and problem solving

Sort the cards into the table.

5 thousands       $4,000 + 300 + 50 + 9$

100 less than 5,090      8,543

one thousand, seven hundred and six



Numbers 5,000 or greater	Numbers less than 5,000

5,000 or greater:

5,000

8,543

less than 5,000:

4,359

4,990

1,706

599

Tiny is thinking of a number.



- It is greater than 4,200 but less than 5,800
- The digits sum to 16

What number could Tiny be thinking of?

Give four possible answers.

various possible answers, e.g.

4,219

5,227

4,930

5,713

Use the digit cards to complete the comparison.



You can use each digit once only.

$$5,64\_ < \_,73\_$$

$$2,\_38 > 2,3\_5$$

various possible answers, e.g.

$$5,641 < 5,732$$

$$2,438 > 2,335$$

# Order numbers to 10,000

## Notes and guidance

In this small step, children order a set of numbers up to 10,000

Children order numbers from the smallest to the greatest and the greatest to the smallest. They also use language such as “ascending” and “descending” when putting the numbers in order. Children are given examples where the same digit is used in the thousands or the hundreds column so that they need to look at the other digits to determine the value. They also include zero in different places to check understanding of placeholders.

Base 10 and place value counters are used to represent numbers to help children make comparisons. Making links with numbers in real-life situations, such as prices and measurements, is also useful.

## Things to look out for

- Children may just look at the digits and not consider the place value.
- Children may need to be reminded of the meanings of the words “ascending” and “descending”.
- Children may need to be reminded about 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 the 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

- \_\_\_\_\_ is greater than \_\_\_\_\_, so \_\_\_\_\_ thousand is greater than \_\_\_\_\_ thousand.
- \_\_\_\_\_ is less than \_\_\_\_\_, so \_\_\_\_\_ thousand is less than \_\_\_\_\_ thousand.

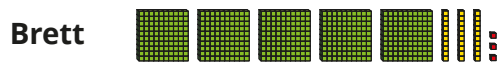
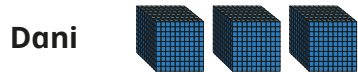
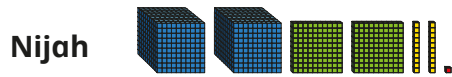
## National Curriculum links

- Order and compare numbers beyond 1,000

# Order numbers to 10,000

## Key learning

- Nijah, Dani and Brett are making numbers with base 10



Who has made the greatest number?

Who has made the smallest number?

How do you know?

- Tom makes four numbers using place value counters.

Th	H	T	O
4,000	100	10	1

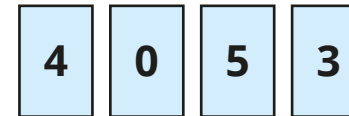
Th	H	T	O
3,000		10	4

Th	H	T	O
4,000	200		

Th	H	T	O
3,000			1

Write Tom's numbers in order, from the smallest to the greatest.

- Here are four digit cards.



Arrange them to make five different 4-digit numbers.

Put your numbers in ascending order.

- Put four counters in the place value chart to make six different numbers.

Thousands	Hundreds	Tens	Ones



Write your numbers in descending order.

- Write the amounts in order. Start with the smallest amount.

£599	£1,732	£1,042	£1,742
------	--------	--------	--------

Write the measurements in order. Start with the greatest measurement.

4,212 m	8,056 m	916 m	4,209 m
---------	---------	-------	---------

# Order numbers to 10,000

## Reasoning and problem solving

These numbers are in order from greatest to smallest.



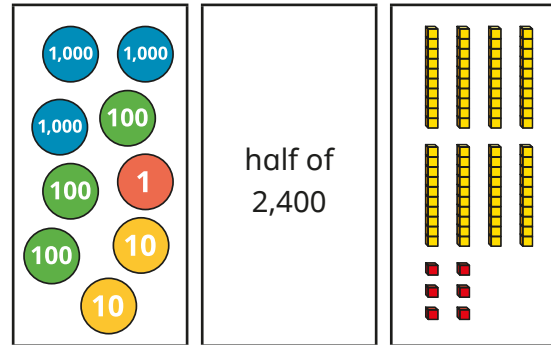
3,6\_\_4      3,\_\_29      3,5\_\_8

6

The same digit is missing from each number.

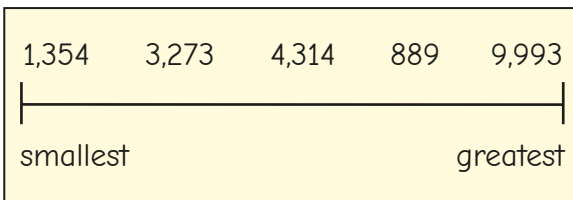
What is the missing digit?

Put the numbers in ascending order.



- 86 (base 10)
- 1,200 (half of 2,400)
- 3,321 (counters)

Aisha has written five numbers in ascending order.

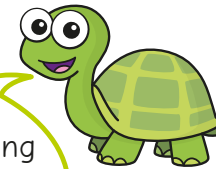


What mistake has she made?

Aisha has focused on the first digit and not necessarily its value.

889 is a 3-digit number and is the smallest.

When I put numbers into descending order, I just need to look at the greatest place value column.



No

Is Tiny correct?

Explain your answer.



# Roman numerals

## Notes and guidance

Children build on their knowledge of Roman numerals from 1 to 12 on a clock face, and learn that L represents 50 and C represents 100

Children explore the similarities and differences between the Roman number system and our number system, understanding that the Roman system does not have a zero and does not use placeholders. They are already familiar with the idea that, for example, 4 is written as IV rather than IIII, and they apply the same concept to write 40 as XL and 90 as XC.

Roman numerals can be revisited later in this block (for example, rounding XXV to the nearest 10) or within the addition and subtraction block.

### 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 XC as 110 instead of 90
- It is more difficult to convert numbers that require large strings of Roman numerals.
- Children may think that numbers like 99 can be written as IC instead of XCIX.

## Key questions

- What patterns can you see in the Roman number system?
- What rules do you 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 in when using Roman numerals?
- What is the same and what is different about representing the number twenty-nine in the Roman number system and our number system?

## Possible sentence stems

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

### National Curriculum links

- Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value



# Roman numerals

## Key learning

- Write each number in Roman numerals.

20	50	60	62
64	78	85	99

- Four numbers are written in Roman numerals.

XXIV	LIX
LXXXVII	XCVII

What are the numbers?

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

Complete the diagrams.


- Choose the correct answer to each calculation.

▶ L + L	LL	X	C	V
▶ C - X	CX	XC	V	L
▶ IX + XI	XX	XXII	IXXI	IXIX

- Complete the function machines.

input		output	input		output
LXXV	→ + 10 →			→ - 1 →	XXXI

- Write <, > or = to complete the statements.

49 ○ L	XL ○ 21 + 19
IV ○ VI	L ○ C - L
C ○ LX	XC - X ○ C

# Roman numerals

## Reasoning and problem solving

Is the statement true or false?

$$XX + II = XXII,$$

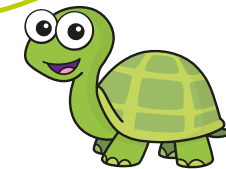
$$\text{so } XXII + XXII = XXIIXXII$$

False

Explain your answer.



In the 10 times-table, all multiples of 10 end in a zero. This means that in Roman numerals multiples of 10 end in X.



Is Tiny's statement always, sometimes or never true?

Give examples to support your answer.

sometimes true, e.g.  
20 = XX, 80 = LXXX  
sometimes false, e.g.  
50 = L and 100 = C

Work out the calculation, giving your answer in Roman numerals.

$$XIV + XXXVI$$

Make up some other calculations using Roman numerals that have the same answer.

L

multiple possible answers, e.g.

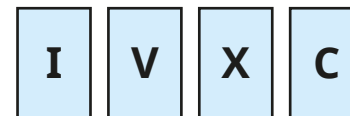
$$C \div II$$

$$L \div I$$

$$X \times V$$

$$XXV \times II$$

Which of these Roman numerals is never written to the left of X?



V

# Round to the nearest 10

## Notes and guidance

In this small step, children are introduced to rounding for the first time, starting with rounding to the nearest 10

Children begin by focusing on rounding 2-digit numbers, as it is clearer what the previous and next multiples of 10 are.

When building on this and starting to round 3-digit numbers, it is important to include examples that have zero as a placeholder in the tens column, for example 304, as children can often think that 300 is not a multiple of 10 because it is a multiple of 100

Number lines can be used not only to identify the previous and next multiple of 10, but also which multiple of 10 a number is closer to. Children should understand the convention that when the ones digit is 5, they round to the next multiple of 10

Avoid using language such as “round up” and “round down”, as this can create misconceptions.

## Things to look out for

- Children may look at the wrong column when deciding which way to round, and use the tens column instead of the ones column.
- Children may think that, for example, 52 “rounds down” and give the result as 42 or 40

## Key questions

- What is the multiple of 10 after \_\_\_\_\_?
- What is the multiple of 10 before \_\_\_\_\_?
- Which multiple of 10 is \_\_\_\_\_ closer to? How do you know?
- Which numbers rounded to the nearest 10 result in zero?
- Which place value column do you need to look at to decide which multiple to round to?
- What numbers when rounded to the nearest 10 give the result 50/500?

## Possible sentence stems

- The two multiples of 10 the number lies between are \_\_\_\_\_ and \_\_\_\_\_
- \_\_\_\_\_ is closer to \_\_\_\_\_ than \_\_\_\_\_
- \_\_\_\_\_ rounded to the nearest 10 is \_\_\_\_\_

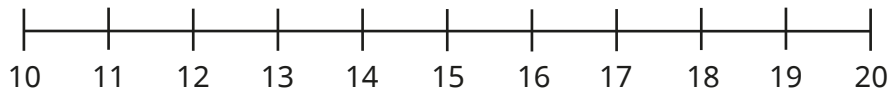
## National Curriculum links

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

# Round to the nearest 10

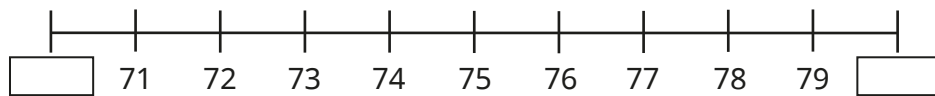
## Key learning

- Use the number lines to help you complete the sentences.



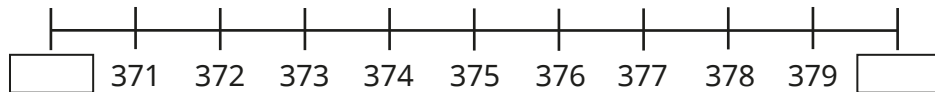
13 is closer to \_\_\_\_\_ than \_\_\_\_\_

13 rounded to the nearest 10 is \_\_\_\_\_



78 is closer to \_\_\_\_\_ than \_\_\_\_\_

78 rounded to the nearest 10 is \_\_\_\_\_

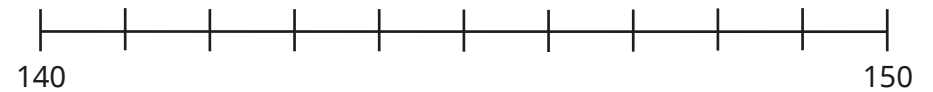


378 is closer to \_\_\_\_\_ than \_\_\_\_\_

378 rounded to the nearest 10 is \_\_\_\_\_

375 rounded to the nearest 10 is \_\_\_\_\_

- Use the number line to help you complete the sentences.



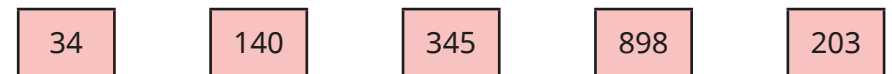
143 rounded to the nearest 10 is \_\_\_\_\_

146 rounded to the nearest 10 is \_\_\_\_\_

145 rounded to the nearest 10 is \_\_\_\_\_

150 rounded to the nearest 10 is \_\_\_\_\_

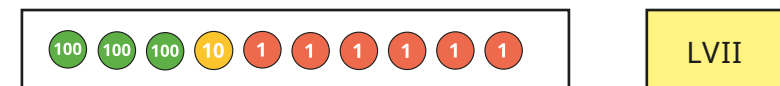
- Round each number to the nearest 10



- Which numbers round to 760 to the nearest 10?

**761      765      760      763      755**

- Round each number to the nearest 10



# Round to the nearest 10

## Reasoning and problem solving

Annie and Jack are rounding 562 to the nearest 10



Annie

It rounds to 570 because 6 is more than 5

It rounds to 560 because 2 is less than 5



Jack

Jack

Who do you agree with?  
Explain your answer.



When rounded to the nearest 10, there are 350 children in a running club.  
How many children could there be?



345, 346, 347, 348, 349, 350, 351, 352, 353 or 354

445 can round to 440 or 450



What mistake has Tiny made?

If the ones digit is a 5, the number rounds to the next multiple of 10  
445 rounds to 450

# Round to the nearest 100

## Notes and guidance

Building on the previous step, children now begin to round numbers to the nearest 100

Children begin by focusing on rounding 3-digit numbers, as it is clearer what the previous and next multiples of 100 are. It is important to discuss what is the same and what is different when rounding numbers to 10 and 100. By doing this, children can begin to understand that when asked to round to a given amount, they need to look at the next place value column to the right.

It is helpful to use examples that are less than 50, so children see that these round to the previous multiple of 100, which is zero.

As in the previous step, avoid using language such as “round up” and “round down”, as this can create misconceptions.

## Things to look out for

- Children may look at the wrong column to decide which way to round and use the hundreds column instead of the tens column.
- Children may focus on rules about “up” and “down” instead of looking at multiples of 100, for example rounding 432 to 402 or 332

## Key questions

- What is the multiple of 100 after \_\_\_\_\_?
- What is the multiple of 100 before \_\_\_\_\_?
- Which multiple of 100 is \_\_\_\_\_ closer to? How do you know?
- Which numbers rounded to the nearest 100 result in zero?
- Which place value column do you need to look at to decide which multiple to round to?
- What is the same and what is different about rounding to the nearest 10 and rounding to the nearest 100?

## Possible sentence stems

- The two multiples of 100 the number lies between are \_\_\_\_\_ and \_\_\_\_\_
- \_\_\_\_\_ is closer to \_\_\_\_\_ than \_\_\_\_\_
- \_\_\_\_\_ rounded to the nearest 100 is \_\_\_\_\_

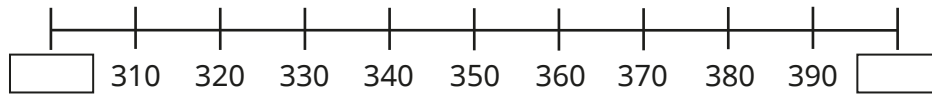
## National Curriculum links

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

# Round to the nearest 100

## Key learning

- Which multiples of 100 do the numbers lie between?

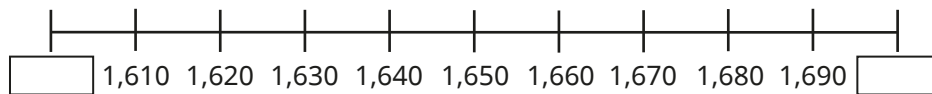


Use the number line to help you complete the sentences.

340 is closer to \_\_\_\_\_ than \_\_\_\_\_

340 rounded to the nearest 100 is \_\_\_\_\_

- Complete the number line and the sentences.



1,610 is closer to \_\_\_\_\_ than \_\_\_\_\_

1,610 rounded to the nearest 100 is \_\_\_\_\_

1,681 is closer to \_\_\_\_\_ than \_\_\_\_\_

1,681 rounded to the nearest 100 is \_\_\_\_\_

1,650 rounded to the nearest 100 is \_\_\_\_\_

- Round each number to the nearest 100

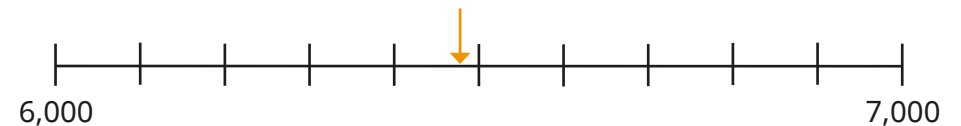
403	350	728	4,551
76	7,005	49	1,925

- Round each number to the nearest 100

H	T	O

Th	H	T	O

LXXI



# Round to the nearest 100

## Reasoning and problem solving



To the nearest 100, there are 600 people at a football match.

What is the smallest number of people that could be at the football match?

What is the greatest number of people that could be at the football match?

How would your answers change if the number of people at the football match was 600 when rounded to the nearest 10?

550

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649

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595

604

To the nearest 100, there are 4,600 people at a concert.



The sum of the digits in the number is 15

How many people could there be?

4,551, 4,560, 4,605,  
4,614, 4,623, 4,632,  
4,641

Tommy is thinking of a number.



My number rounds to 4,500 to the nearest 100, but to a different number when rounded to the nearest 10

What number could Tommy be thinking of?

How many answers can you find?

4,450 to 4,494  
4,505 to 4,549



# Round to the nearest 1,000

## Notes and guidance

Building on the previous small steps, children round numbers to the nearest 1,000

Children begin by discussing which multiple of 1,000 a number is closest to. They can then identify that if the digit in the hundreds column is between zero and 4, they round to the previous multiple of 1,000, but if the digit in the hundreds column is 5 or above, they round to the next multiple of 1,000

Children make links with rounding numbers to the nearest 10 or 100, all of which are explored in the next step.

It is helpful to use examples that are less than 500, so children see that these round to the previous multiple of 1,000, which is zero.

As in the previous steps, avoid language such as “round up” and “round down”, as this can create misconceptions.

## Things to look out for

- Children may look at the wrong column to decide which way to round and use the thousands column instead of the hundreds column.
- Children may focus on rules about “up” and “down” instead of looking at multiples of 1,000, for example rounding 6,432 to 5,432

## Key questions

- What is the multiple of 1,000 after \_\_\_\_\_?
- What is the multiple of 1,000 before \_\_\_\_\_?
- Which multiple of 1,000 is \_\_\_\_\_ closer to?  
How do you know?
- Which numbers rounded to the nearest 1,000 result in zero?
- Which place value column do you need to look at to decide which multiple to round to?
- What is the same and what is different about rounding to the nearest 10, 100 and 1,000?

## Possible sentence stems

- The two multiples of 1,000 the number lies between are \_\_\_\_\_ and \_\_\_\_\_
- \_\_\_\_\_ is closer to \_\_\_\_\_ than \_\_\_\_\_
- \_\_\_\_\_ rounded to the nearest 1,000 is \_\_\_\_\_

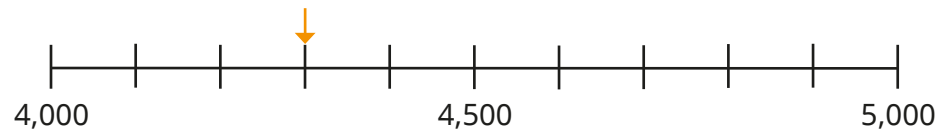
## National Curriculum links

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

# Round to the nearest 1,000

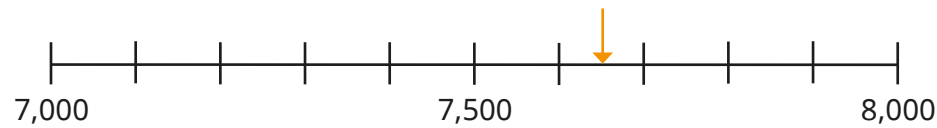
## Key learning

- Use the number lines to help you complete the sentences.



4,300 is closer to \_\_\_\_\_ than \_\_\_\_\_

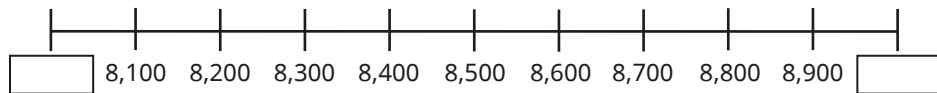
4,300 rounded to the nearest 1,000 is \_\_\_\_\_



7,650 is closer to \_\_\_\_\_ than \_\_\_\_\_

7,650 rounded to the nearest 1,000 is \_\_\_\_\_

- Complete the number line.



Draw an arrow to show 8,550 on the number line.

8,550 rounded to the nearest 1,000 is \_\_\_\_\_

- Round each number to the nearest 1,000

2,290	720	3,450	9,932
5,049	53	6,500	9,502

- Which numbers round to 9,000 to the nearest 1,000?

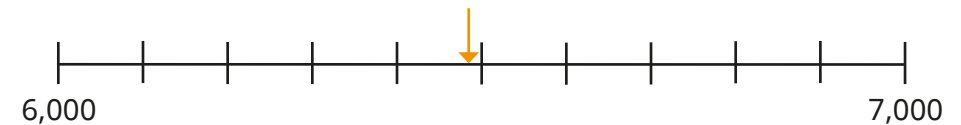
**8,099    9,094    8,999    9,499    8,750    10,000**

- Round each number to the nearest 1,000

Th	H	T	O
3	7	4	2

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



four thousand, six hundred and forty-three

# Round to the nearest 1,000

## Reasoning and problem solving

Each of the numbers round to 4,000 to the nearest 1,000

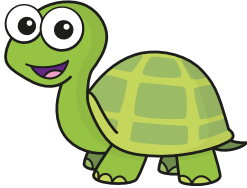
What could the missing digits be?

4, \_\_\_28                      \_\_\_,842

4,2\_\_\_8                        \_\_\_,482

- 0 to 4            3
- 0 to 9           4

496 cannot round to the nearest 1,000 as it has fewer than 5 hundreds.



Do you agree with Tiny?  
Explain your answer.

No

Rosie makes a 4-digit number using the digit cards.

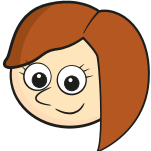
6

4

9

5

My number rounds to 6,000 to the nearest 1,000



What number could Rosie have made?  
Is there more than one possibility?

- 5,649, 5,694, 5,946,
- 5,964, 6,459, 6,495

# Round to the nearest 10, 100 or 1,000

## Notes and guidance

In this small step, children round to the nearest 10, 100 or 1,000, choosing the appropriate columns to look at.

Discuss with children what is the same and what is different when rounding numbers to the nearest 10, 100 or 1,000.

Ensure children understand that when asked to round to a given amount, they need to look at the place value column to the right of that of the required accuracy to decide whether to round to the previous or next multiple. It is worth discussing with children when each degree of accuracy is more appropriate.

As with the previous steps, avoid language such as “round up” and “round down”, as this can create misconceptions.

## Things to look out for

- When rounding numbers to different degrees of accuracy, children may look at the wrong column(s).
- Children may not realise that the answer can be the same when a number is rounded to different degrees of accuracy.
- When rounding the same number to different degrees of accuracy, children may not always use the starting number but, for example, round it to the nearest 10, then round this value to the nearest 100 and so on.

## Key questions

- What is the multiple of 10/100/1,000 after \_\_\_\_\_?
- What is the multiple of 10/100/1,000 before \_\_\_\_\_?
- Which multiple of 10/100/1,000 is \_\_\_\_\_ closer to?  
How do you know?
- Which numbers rounded to the nearest 10/100/1,000 result in zero?
- Which place value column do you need to look at to decide which multiple to round to?
- What is the same and what is different about rounding to the nearest 10, 100 and 1,000?

## Possible sentence stems

- The two multiples of 10/100/1,000 the number lies between are \_\_\_\_\_ and \_\_\_\_\_
- \_\_\_\_\_ is closer to \_\_\_\_\_ than \_\_\_\_\_
- \_\_\_\_\_ rounded to the nearest 10/100/1,000 is \_\_\_\_\_

## National Curriculum links

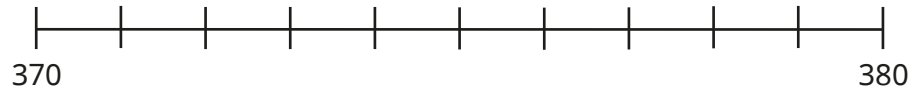
- Round any number to the nearest 10, 100 or 1,000

# Round to the nearest 10, 100 or 1,000

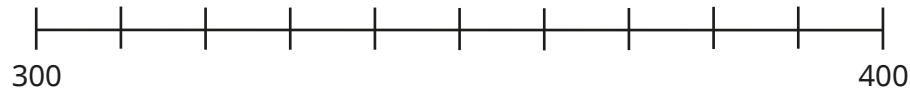
## Key learning

- Draw an arrow to mark 376 on each number line.

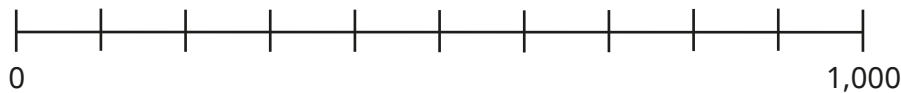
Complete the sentences.



376 rounded to the nearest 10 is \_\_\_\_\_



376 rounded to the nearest 100 is \_\_\_\_\_



376 rounded to the nearest 1,000 is \_\_\_\_\_

- Here is a number.

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

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

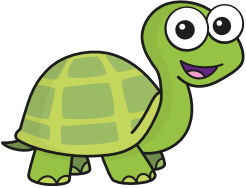
- Complete the table.

Number	7,126	4,996	2,006	499
Rounded to the nearest 10				
Rounded to the nearest 100				
Rounded to the nearest 1,000				

- A baker uses 4,285 g of flour.  
Round the mass of flour to the nearest 100 g.  
Round the mass of flour to the nearest 10 g.  
Round the mass of flour to the nearest kilogram.  
Which do you think is the most appropriate way of rounding the number?
- A school fete raises £2,166  
Round this amount to the nearest £10, nearest £100 and nearest £1,000  
Which do you think is the most appropriate way of rounding the number?

# Round to the nearest 10, 100 or 1,000

## Reasoning and problem solving



5,683 rounded to the nearest 10 is 5,700

What mistake has Tiny made?  
What is the correct answer?

Tiny has rounded to the nearest 100 instead of the nearest 10

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5,680

Would you round to the nearest 10, 100 or 1,000?

- number of people at a football match
- number of children at a school
- number of coins in a jar

Discuss this as a class.

Whitney puts some counters on a place value chart to make a number.

Th	H	T	O

My number rounds to 6,000 when rounded to the nearest 10, 100 or 1,000

What could Whitney's number be?  
What must Whitney's number be if she uses exactly 30 counters?

between 5,995 and 6,004

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5,997

Autumn Block 2

# Addition and subtraction

## Small steps

Step 1

Add and subtract 1s, 10s, 100s and 1,000s

Step 2

Add up to two 4-digit numbers – no exchange

Step 3

Add two 4-digit numbers – one exchange

Step 4

Add two 4-digit numbers – more than one exchange

Step 5

Subtract two 4-digit numbers – no exchange

Step 6

Subtract two 4-digit numbers – one exchange

Step 7

Subtract two 4-digit numbers – more than one exchange

Step 8

Efficient subtraction



## Small steps

Step 9

Estimate answers

Step 10

Checking strategies

## Add and subtract 1s, 10s, 100s and 1,000s

### Notes and guidance

In Year 3, children explored adding and subtracting 1s, 10s and 100s to/from any 3-digit number, including using a mental strategy when crossing a multiple of 10 or 100

In this small step, children recap this learning and extend their understanding to dealing with 4-digit numbers and adding and subtracting multiples of 1,000. The focus is on mental rather than written strategies, which are covered later in the block.

It is important to explore the effect of either adding or subtracting a multiple of 1, 10, 100 or 1,000 by discussing which columns always, sometimes and never change. For example, when adding a multiple of 100, the ones and tens never change, the hundreds always change and the thousands sometimes change, depending on the need to make an exchange.

### Things to look out for

- Children may identify the incorrect place value column, particularly if they are using plain counters in a place value chart, for example  $3,469 - 300 = 469$  or  $3,439$
- Confusion may arise with zero as a placeholder.
- Children may find crossing the next or previous multiple challenging.

### Key questions

- If you know  $2 + 4 = 6$ , what else do you know?
- How will you partition \_\_\_\_\_? Why?
- Will the value in the ones/tens/hundreds/thousands column increase or decrease? By how much?
- Which place value columns have changed/stayed the same? Why?
- What is the inverse of subtracting 300?

### Possible sentence stems

- The next/previous multiple of 10/100/1,000 is \_\_\_\_\_
- I can partition \_\_\_\_\_ into \_\_\_\_\_ and \_\_\_\_\_ because ...
- The value of the \_\_\_\_\_ column will increase/decrease by \_\_\_\_\_

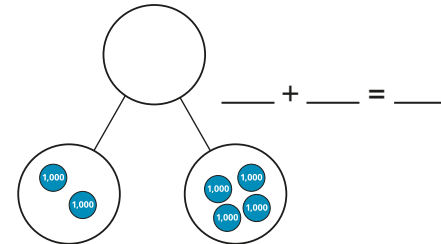
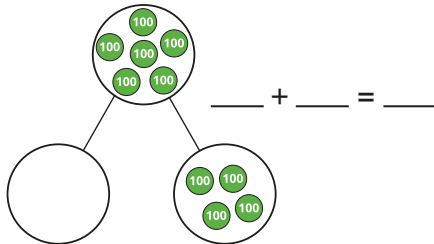
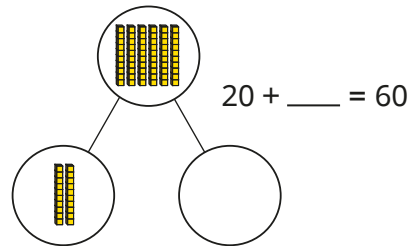
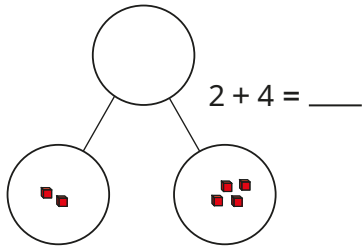
### National Curriculum links

- Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

# Add and subtract 1s, 10s, 100s and 1,000s

## Key learning

- Complete the part-whole models and number sentences.



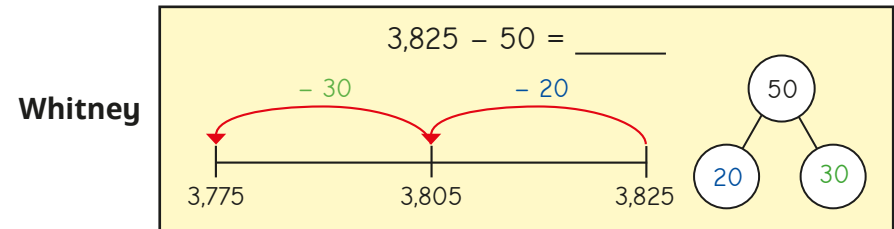
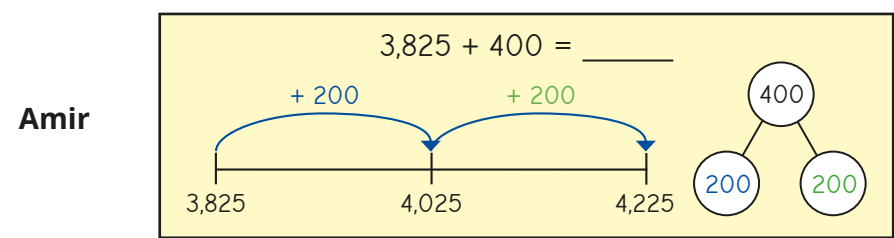
What do you notice?

- Use a place value chart to help you complete the number sentences.

- ▶  $1,364 + 3 = \underline{\quad}$
- ▶  $1,364 + 30 = \underline{\quad}$
- ▶  $1,364 + 300 = \underline{\quad}$
- ▶  $1,364 + 6,000 = \underline{\quad}$
- ▶  $1,364 - 1 = \underline{\quad}$
- ▶  $1,364 - 60 = \underline{\quad}$
- ▶  $1,364 - 200 = \underline{\quad}$
- ▶  $1,364 - 1,000 = \underline{\quad}$

What do you notice? What stays the same and what changes?

- Amir and Whitney are using number lines to add and subtract.



Use this method to work out the calculations.

$$2,418 + 6$$

$$2,418 + 800$$

$$2,418 + 90$$

$$2,418 - 30$$

$$2,418 - 9$$

$$2,418 - 700$$

- There are 1,286 patients and doctors in a hospital.

300 patients leave after being treated.

Another 90 patients arrive.

7 doctors leave.

How many patients and doctors are in the hospital now?

# Add and subtract 1s, 10s, 100s and 1,000s

## Reasoning and problem solving



If I add or subtract a multiple of 10, the only place value columns that might change are the tens and hundreds.



Ron is partially correct. However, the thousands may also change, e.g.  
 $1,983 + 30 = 2,013$

Do you agree with Ron?  
 Explain your reasons.

Rosie is finding the missing number in \_\_\_\_\_ - 300 = 2,895



Rosie has subtracted 300 from the answer rather than using the inverse.



$2,895 - 300 = 2,595$

What mistake has Rosie made?  
 Work out the missing number.

3,195

Here is a number on a place value chart.



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

I am going to add two counters to a column and then remove one counter from a column.



What number could Tiny have now?

multiple possible answers, e.g.  
 2,892, 3,792,  
 3,882, 3,891  
 1,092

# Add up to two 4-digit numbers – no exchange

## Notes and guidance

In Year 3, children used the formal written method to add two 2- or 3-digit numbers, with up to two exchanges. In this block, that learning is extended to include 4-digit numbers. In this small step, they add 3- or 4-digit numbers with no exchanges, using concrete resources as well as the formal written method.

The numbers being added together may have a different number of digits, so children need to take care to line up the digits correctly. Even though there will be no exchanging, the children should be encouraged to begin adding from the ones column. When working within each column, ask, “Do you have enough ones/tens/hundreds to make an exchange?” This will prepare them for future small steps where exchanging will be necessary.

## Things to look out for

- Children may not line up the digits in the place value columns correctly.
- Children may assume they should start adding from left to right. Be careful as this may appear to be a good strategy given there are no exchanges required in this small step.
- Children may not use zero as a placeholder when there are no hundreds, tens or ones.

## Key questions

- How can you represent the question using base 10?
- How can you put these numbers into a place value chart?
- Does it matter which columns you add together first?
- Do you have enough ones/tens/hundreds to make an exchange?
- What do you write in the tens column if there are no tens?

## Possible sentence stems

- \_\_\_\_\_ ones added to \_\_\_\_\_ ones is equal to \_\_\_\_\_ ones.
- \_\_\_\_\_ added to \_\_\_\_\_ is equal to \_\_\_\_\_
- I have \_\_\_\_\_ ones, so I do/do not need to make an exchange.

## National Curriculum links

- Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

# Add up to two 4-digit numbers – no exchange

## Key learning

- Use counters and a place value chart to work out  $3,256 + 2,532$

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

Th	H	T	O
3	2	5	6
+	2	5	3
<hr/>			
<hr/>			

- Complete the additions.

Th	H	T	O
4	1	3	5
+	2	6	1
<hr/>			
<hr/>			

Th	H	T	O
3	1	4	2
+	5	3	7
<hr/>			
<hr/>			

Th	H	T	O
5	0	8	1
+	3	7	0
<hr/>			
<hr/>			

Th	H	T	O
2	7	0	6
+	1	0	3
<hr/>			
<hr/>			

- Fill in the missing numbers.

1,052	5,945

	3,194	↔ 405

- Work out the missing numbers.

Th	H	T	O
4		6	
+	2	5	1
<hr/>			
	7	8	9

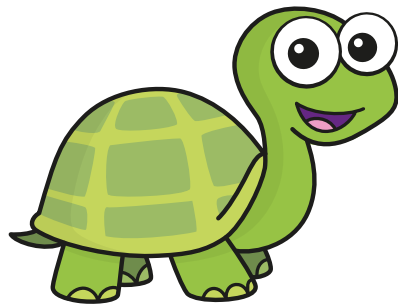
- Tommy walks 3,420 m.  
Eva walks 356 m.  
How far do they walk altogether?

# Add up to two 4-digit numbers – no exchange

## Reasoning and problem solving

Tiny works out  $1,234 + 345$

The answer is 4,684



1,579

What mistake has Tiny made?  
What is the correct answer?



Dani and Aisha are raising money for charity.



Dani raises £2,304 and Aisha raises £1,695

How much money have they raised altogether?

Scott and Tom are also raising money for charity.

So far, Scott has raised £1,423 and Tom has raised £121 more than Scott.

How much have Scott and Tom raised altogether?

Scott   $\longleftrightarrow$  121

Tom

Compare methods with a partner.



£3,999

£2,967

(Tom: £1,544)

## Add two 4-digit numbers – one exchange

### Notes and guidance

Building on the previous small step, children now add two 4-digit numbers with one exchange in any column. In Year 3, they explored 3-digit addition with up to two exchanges, so they should be familiar with the process.

The numbers can be made using concrete manipulatives such as place value counters in a place value chart, alongside the formal written method. When discussing where to start an addition, it is important to use language such as begin from the “smallest value column” rather than the “ones column” to avoid any misconceptions when decimals are introduced later in the year. After each column is added, ask, “Do you have enough ones/tens/hundreds to make an exchange?” This question will be an important one in this small step, as the children do not know which column will be the one where an exchange is needed.

### Things to look out for

- Children may not line up the digits in the place value columns correctly.
- Children may not add up from the smallest value column, and so will not be able to exchange correctly.
- Children may not use zero as a placeholder when there are no hundreds, tens or ones.

### Key questions

- How many thousands/hundreds/tens/ones are there altogether?
- What is \_\_\_\_\_ more than \_\_\_\_\_?
- Does it matter which columns you add together first?
- Do you have enough ones/tens/hundreds to make an exchange?
- When exchanging 10 hundreds, where do you put the thousand?

### Possible sentence stems

- \_\_\_\_\_ ones added to \_\_\_\_\_ ones is equal to \_\_\_\_\_ ones.
- \_\_\_\_\_ added to \_\_\_\_\_ is equal to \_\_\_\_\_
- I have \_\_\_\_\_ hundreds, so I do/do not need to make an exchange.
- I can exchange 10 \_\_\_\_\_ for 1 \_\_\_\_\_

### National Curriculum links

- Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why





# Add two 4-digit numbers – one exchange

## Reasoning and problem solving

Tiny completes this addition.

	Th	H	T	O
	4	0	8	6
+	1	5	3	2
	5	5	1	9
				1

5,618

What mistake has Tiny made?  
Find the correct answer.

What is the missing 4-digit number?

	Th	H	T	O
+	6	3	9	5
	8	9	4	9

2,554

Dexter adds a 4-digit number to a 2-digit number.



The answer is 9,090

	Th	H	T	O
+				
	9	0	9	0

What could Dexter's numbers be?

multiple possible answers, e.g.

$$9,025 + 65$$

$$9,040 + 50$$

$$8,991 + 99$$

# Add two 4-digit numbers – more than one exchange

## Notes and guidance

Building on the previous small step, children now add two 4-digit numbers with more than one exchange.

The numbers are made using place value counters in a place value chart alongside the formal written method. The addition begins from the smallest value column. After each column is added, ask, “Do you have enough ones/tens/hundreds to make an exchange?” This question is important at every stage as there will be more than one exchange to make. With more than one exchange, it is important to model the correct place to write the number exchanged and to add it to the next column.

### Things to look out for

- Children may not line up the digits in the place value columns correctly, especially the digits created by exchanging.
- Children may forget to add from the smallest value column first.
- Children may not realise that two digits that look as though they will not total enough to make an exchange could do so once an exchange has happened, for example  $5 + 4$  plus an extra 1 exchanged from the previous column.

## Key questions

- How many ones/tens/hundreds/thousands are there in total?
- What is \_\_\_\_\_ more than \_\_\_\_\_?
- Does it matter which columns you add together first?
- Do you have enough ones/tens/hundreds to make an exchange?
- How can you make an exchange in more than one column in the same addition?

## Possible sentence stems

- \_\_\_\_\_ ones added to \_\_\_\_\_ ones is equal to \_\_\_\_\_ ones.
- \_\_\_\_\_ plus \_\_\_\_\_ plus the 1 that I exchanged from the last column is equal to \_\_\_\_\_
- I have \_\_\_\_\_ hundreds/tens/ones, so I do/do not need to make an exchange.

## National Curriculum links

- Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

# Add two 4-digit numbers – more than one exchange

## Key learning

- Nijah uses place value counters to help her work out  $4,673 + 1,518$

Th	H	T	O
4	6	7	3
+	1	5	1
<hr/>			
6	1	9	1
1			1

Use Nijah's method to work out the additions.

Th	H	T	O
3	2	7	5
+	6	1	5
<hr/>			

Th	H	T	O
5	9	3	4
+	2	2	4
<hr/>			

Th	H	T	O
1	7	7	2
+	2	2	5
<hr/>			

- Complete the additions.

$4,507 + 1,648$
-----------------

$4,507 + 674$
---------------

$4,507 + 95$
--------------

- Jack uses place value counters to work out  $1,945 + 1,257$

Th	H	T	O
1	9	4	5
+	1	2	5
<hr/>			
3	2	0	2
1	1	1	

Use Jack's method to work out the additions.

$4,893 + 1,758$
-----------------

$3,546 + 1,794$
-----------------

$2,305 + 1,896$
-----------------

- White Rose FC are playing a football match against Red Rose Rovers.  
2,438 fans come to watch White Rose FC.  
1,765 fans come to watch Red Rose Rovers.  
How many fans come to watch the match altogether?

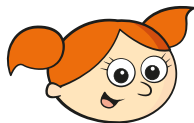
# Add two 4-digit numbers – more than one exchange

## Reasoning and problem solving

Alex is working out this addition.

	Th	H	T	O
	1	3	6	4
+	1	2	3	7
<hr/>				
<hr/>				

I think there will be only one exchange in this calculation because only  $4 + 7$  is greater than 9



Is Alex correct?

Explain how you know.



No

Teddy works out  $3,218 + 1,354$



	Th	H	T	O
	3	2	1	8
+	1	3	5	4
<hr/>				
			2	

How do you know that Teddy's answer cannot be correct?

When adding two numbers together, the greatest digit that can be carried over is 1

Rosie and Mo each have some points on a computer game.

Mo has 599 fewer points than Rosie.

Mo has 4,278 points.

How many points do they have altogether?

9,155

# Subtract two 4-digit numbers – no exchange

## Notes and guidance

In Year 3, children used the formal written method to subtract two 2- or 3-digit numbers with up to two exchanges. In this block, that learning is extended to include 4-digit numbers. In this small step, children subtract up to a 4-digit number from a 4-digit number with no exchanges, using concrete resources as well as the formal written method.

Even though there is no exchanging, children should subtract from the smallest value column first. Before subtracting each column, ask, “Do you have enough ones/tens/hundreds to subtract \_\_\_\_\_?” If not, an exchange is needed.

Encouraging children to subtract from the “smallest value column” first, rather than referring to it as the “ones column”, will avoid a misconception when decimals are introduced later in the year.

## Things to look out for

- When using concrete resources, children may make both numbers, then remove the second one, leaving the first number unchanged.
- Children may not line up the digits in the place value columns correctly, especially when the numbers have different numbers of digits.

## Key questions

- How can you show this question using place value counters?
- What is \_\_\_\_\_ less than \_\_\_\_\_?
- Does it matter which column you subtract first?
- Do you need to make an exchange?
- Do you have enough ones/tens/hundreds to subtract \_\_\_\_\_?

## Possible sentence stems

- \_\_\_\_\_ ones/tens/hundreds subtract \_\_\_\_\_ ones/tens/hundreds is equal to \_\_\_\_\_
- I can/cannot subtract \_\_\_\_\_ ones/tens/hundreds from \_\_\_\_\_ ones/tens/hundreds, so I do/do not need to make an exchange.

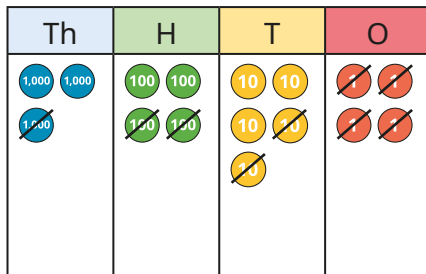
## National Curriculum links

- Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

# Subtract two 4-digit numbers – no exchange

## Key learning

- Dora uses place value counters to work out  $3,454 - 1,224$

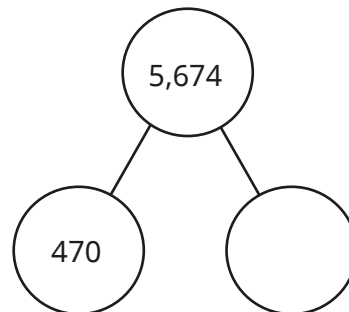
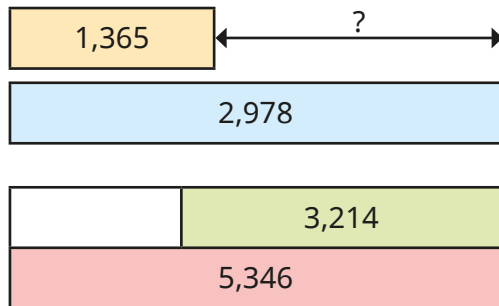


	Th	H	T	O
	3	4	5	4
-	1	2	2	4
	2	2	3	0

Use Dora's method to work out the subtractions.

$4,572 - 2,341$	$7,462 - 7,151$	$6,582 - 582$	$2,348 - 235$
-----------------	-----------------	---------------	---------------

- Find the missing numbers.

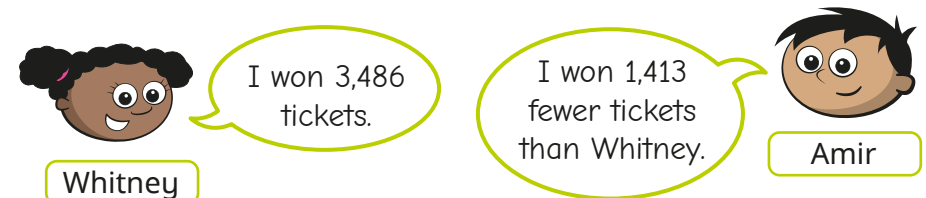


- Use bar models to help you answer each question.

There are 3,597 boys and girls in a school.  
2,182 are boys.  
How many girls are there?

Car A travels 7,653 miles per year.  
Car B travels 5,612 miles per year.  
How much further does car A travel than car B per year?

- The mass of a bag of sand is 3,576 g.  
1,250 g of sand is poured from the bag.  
What is the mass of the bag of sand now?
- Whitney and Amir are at the fair.  
At each stall, they can win tickets.



How many tickets did Amir win?

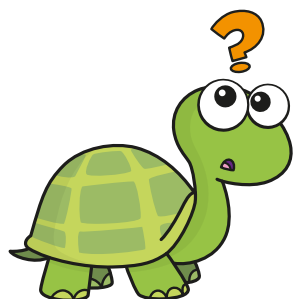
# Subtract two 4-digit numbers – no exchange

## Reasoning and problem solving

Tiny is working out  $3,426 - 1,213$  using place value counters.

Tiny keeps getting 3,426 as the answer.

Th	H	T	O
1,000 1,000	100 100	10 10	1 1
1,000	100 100		1 1
			1 1
<del>1,000</del>	<del>100 100</del>	<del>10</del>	<del>1 1</del>



Explain Tiny's mistake.

Work out the correct answer.

2,213

Fill in the missing digits.

	Th	H	T	O
	9	9	9	9
-			8	
		3		

Compare answers with a partner.

Can you find any more?

for example:

$$9,999 - 3,685 = 6,314$$

$$9,999 - 1,680 = 8,319$$

The mass of a box is 2,479 g.

A teddy bear is 1,305 g lighter than the box.



What is the total mass of the teddy bear and the box?

3,653 g



# Subtract two 4-digit numbers – one exchange

## Notes and guidance

Building on the previous small step, children subtract up to 4-digit numbers, with one exchange. In Year 3, children subtracted 2- and 3-digit numbers with up to two exchanges.

It is important that children complete the formal written method alongside any concrete manipulatives to support understanding.

Before subtracting each column, ask, “Do you have enough ones/tens/hundreds to subtract \_\_\_\_\_?” If not, then an exchange is needed.

For this small step, the exchange could take place from the tens, hundreds or thousands, but there is only one exchange per calculation.

## Things to look out for

- Children may not line up the digits in the place value columns correctly, especially when the numbers have different numbers of digits.
- Children may find the difference between the two digits in a column instead of subtracting the second digit from the first in order to avoid an exchange, for example  $1 - 3$  becomes  $3 - 1$

## Key questions

- What is \_\_\_\_\_ less than \_\_\_\_\_?
- Does it matter which column you subtract first?
- Do you need to make an exchange?
- How can you subtract two numbers if one of them has fewer digits than the other?

## Possible sentence stems

- \_\_\_\_\_ ones/tens/hundreds subtract \_\_\_\_\_ ones/tens/hundreds is equal to \_\_\_\_\_
- I can/cannot subtract \_\_\_\_\_ ones/tens/hundreds from \_\_\_\_\_ ones/tens/hundreds, so I do/do not need to make an exchange.

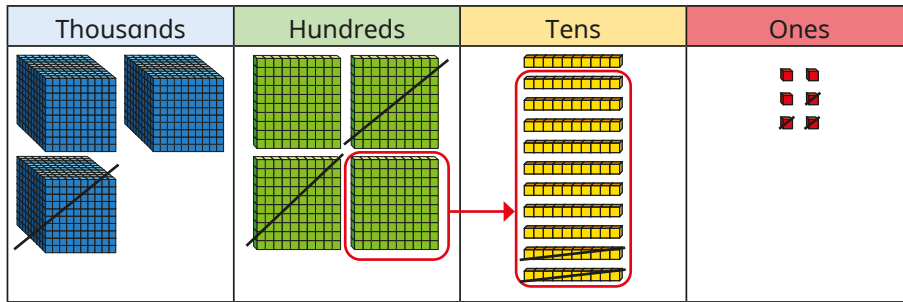
## National Curriculum links

- Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

# Subtract two 4-digit numbers - one exchange

## Key learning

- Rosie uses base 10 to work out  $3,416 - 1,223$



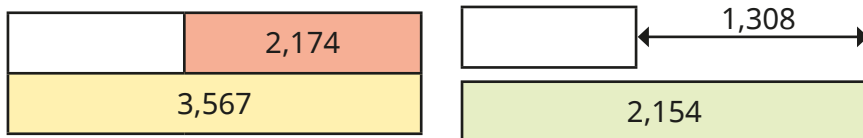
	Th	H	T	O
	3	<del>4</del>	11	6
-	1	2	2	3
	2	1	9	3

Use Rosie's method to help you work out the subtractions.

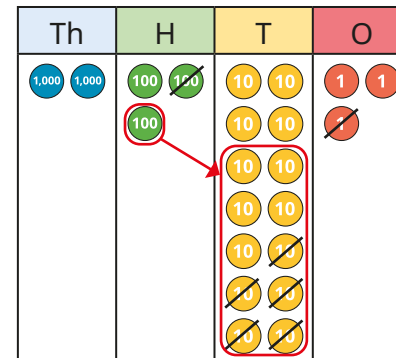
$4,256 - 1,139$	$3,758 - 1,825$	$2,547 - 1,452$
-----------------	-----------------	-----------------

What is the same and what is different about these subtractions?

- Find the missing numbers.



- Ron uses place value counters to work out  $2,343 - 151$



	Th	H	T	O
	2	<del>3</del>	14	3
-		1	5	1
	2	1	9	2

Use place value counters to help you work out the subtractions.

$5,383 - 291$	$3,157 - 523$	$9,458 - 86$
---------------	---------------	--------------

- Use bar models to help you complete the questions.

Mrs Trent has £3,544  
She spends £1,225  
How much money does she have left?

Mrs Khan has £1,745  
She has £1,239 more than Mr Khan.  
How much money does Mr Khan have?

# Subtract two 4-digit numbers – one exchange

## Reasoning and problem solving

1,235 people go on a school trip.

There are 1,179 children and 27 teachers.

The rest are parents.

How many parents are there?

Explain your method to a partner.



29 parents

Find the missing numbers.

$$\underline{\quad\quad\quad} - 1,345 = 4\underline{\quad}6$$

What is the greatest number that could go in the first space?

What is the smallest?

How many possible answers could you have?

What is the pattern between the numbers?

What method did you use?



1,841 (and 9)

1,751 (and 0)

10 possible answers

For each answer, both numbers go up by 10

The subtraction has exactly one exchange.



	Th	H	T	O
	5	6	3	2
-				

What could the missing numbers be if the exchange is in the tens column?

What if the exchange was in another column?

Talk about it with a partner.



various possible answers, e.g.  
2,351 and 3,281

various possible answers, e.g.  
3,810 and 1,822

# Subtract two 4-digit numbers – more than one exchange

## Notes and guidance

In this small step, children subtract up to 4-digit numbers with more than one exchange, using the written method of column subtraction.

Children perform subtractions involving two separate exchanges (for example, from the thousands and from the tens) as well as those with two-part exchanges (for example, from the thousands down to the tens if there are no hundreds in the first number). To support understanding, continue solving these subtractions alongside the concrete resources of base 10 and place value counters.

When completing the written method, it is vital that children are careful with where they put the digits, especially those that have been exchanged. Two-part exchanges can be confusing for children if they are unsure what each digit represents or where to put it.

## Things to look out for

- Children may not line up the digits in the place value columns correctly.
- When exchanging a number, children may put the 1 in the incorrect place.
- When exchanging over two columns, children may exchange directly from, for example, hundreds down to ones and miss out the exchange to tens.

## Key questions

- Does it matter which column you subtract first?
- Do you need to make an exchange?
- How can you subtract two numbers if one of them has fewer digits than the other?
- If you cannot exchange from the tens/hundreds, what do you need to do?
- Which column can you exchange from?

## Possible sentence stems

- \_\_\_\_\_ ones/tens/hundreds subtract \_\_\_\_\_ ones/tens/hundreds is equal to \_\_\_\_\_
- I can/cannot subtract \_\_\_\_\_ ones/tens/hundreds from \_\_\_\_\_ ones/tens/hundreds, so I do/do not need to make an exchange.

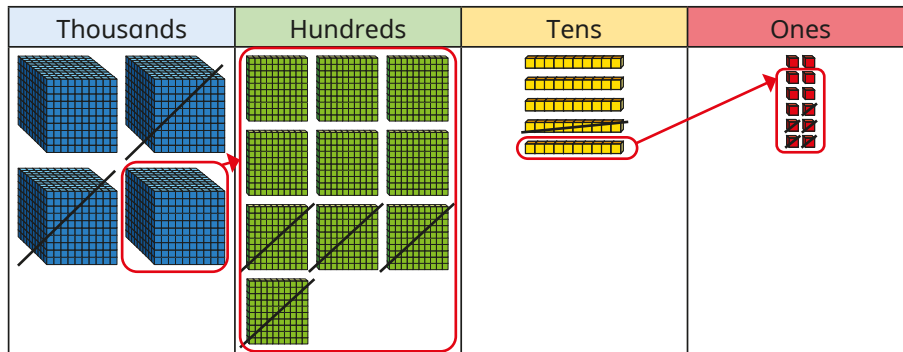
## National Curriculum links

- Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

# Subtract two 4-digit numbers – more than one exchange

## Key learning

- Tommy uses base 10 to help him work out  $4,052 - 2,415$



	Th	H	T	O
	<del>3</del> 4	0	<del>5</del> 12	2
-	2	4	1	5
	1	6	3	7

Use Tommy's method to work out the subtractions.

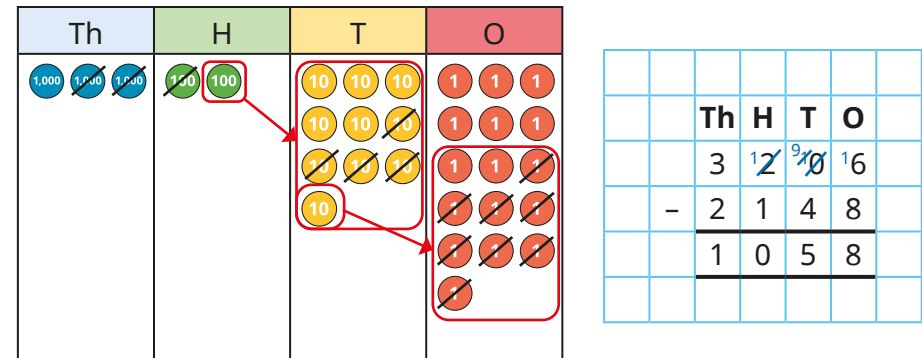
$5,783 - 844$	$6,737 - 759$	$8,252 - 6,560$
---------------	---------------	-----------------

- Mr Jones paid £8,562 for his car.

Mrs Smith paid £6,729 for her car.

How much more did Mr Jones pay for his car than Mrs Smith paid for hers?

- Aisha works out  $3,206 - 2,148$  using place value counters.



	Th	H	T	O
	3	<del>2</del> 12	<del>0</del> 10	6
-	2	1	4	8
	1	0	5	8

Use Aisha's method to work out the subtractions.

$2,356 - 1,427$	$1,205 - 398$	$2,037 - 889$	$2,037 - 1,589$
-----------------	---------------	---------------	-----------------

- A shop has 8,435 magazines.

It sells 367 in the morning and 579 in the afternoon.

How many magazines are left?

8,435		
367	579	

Explain how you found the answer.

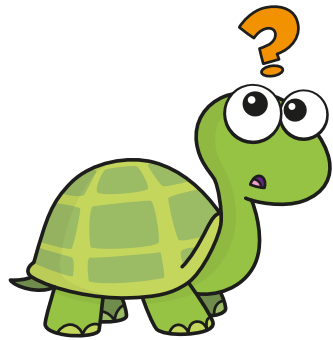
Is there more than one way to solve this problem?

# Subtract two 4-digit numbers – more than one exchange

## Reasoning and problem solving

Tiny has worked out  $3,035 - 1,074$

	Th	H	T	O
	<del>2</del> 3	0	3	5
-	1	0	7	4
	1	0	6	1



Do you agree with Tiny?  
Explain your answer.



No

There were 2,114 visitors to a museum on Saturday.



650 more people visited the museum on Saturday than on Sunday.

Altogether, how many people visited the museum over the two days?

What do you need to do first to solve the problem?

3,578

Work out  $2,114 - 650$  for the number of visitors on Sunday.

Find the missing 4-digit number.

	Th	H	T	O
+	4	6	7	8
	7	4	3	1

2,753

How did you find the answer?  
Is there more than one way?



# Efficient subtraction

## Notes and guidance

Having explored both mental and written methods of subtraction in this block, the purpose of this small step is to encourage children to make choices about which method is most appropriate for a given calculation. Children can often become reliant on formal written methods, so it is important to explicitly highlight where mental strategies or less formal jottings can be more efficient.

Children explore the concept of constant difference, where adding or subtracting the same amount to/from both numbers in a subtraction means that the difference remains the same, for example  $2,832 - 1,999 = 2,833 - 2,000$  or  $400 - 193 = 399 - 192$ . This can help make potentially tricky subtractions with multiple exchanges much simpler, sometimes even becoming calculations that can be performed mentally. Number lines can support understanding of this concept.

## Things to look out for

- Children may be overly reliant on formal written methods and use them when alternative strategies are more appropriate.
- Children may not adjust both numbers in the subtraction.

## Key questions

- Which method do you find easiest? Why?
- Which method is most efficient?
- Can you work this out mentally?
- What does “difference” mean?
- What does the arrow represent? What do you notice about all the arrows?
- Why does adding/subtracting \_\_\_\_\_ to/from each number make the calculation easier?

## Possible sentence stems

- The jump to the next multiple of \_\_\_\_\_ is \_\_\_\_\_
- If I add/subtract \_\_\_\_\_ to/from both numbers, the difference will be the same.

## National Curriculum links

- Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate

# Efficient subtraction

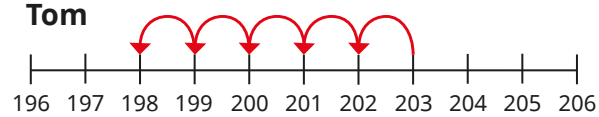
## Key learning

- Kim, Tom and Huan are working out  $203 - 198$

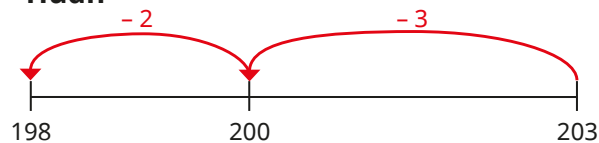
**Kim**

		H	T	O
		<del>1</del>	<del>9</del>	<del>8</del>
-	1	9	8	
	0	0	5	

**Tom**



**Huan**



Whose method do you prefer? Why?

Which is the most efficient method?

Use your preferred method to complete the subtractions.

$9,807 - 9,792$

$809 - 15$

$3,876 - 1,400$

$4,204 - 2,417$

Did you use the same method each time?

- Complete each subtraction.

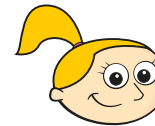
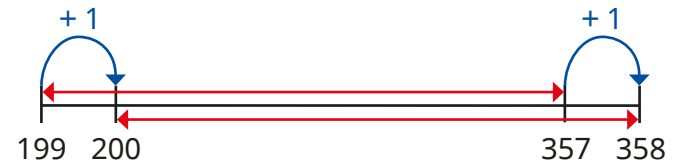
What do you notice?

What stays the same?

What changes?

$6 - 3 = \underline{\quad}$	
$5 - 2 = \underline{\quad}$	
$4 - 1 = \underline{\quad}$	

- Eva is working out  $357 - 199$



If I add or subtract the same amount from both numbers, the difference will be the same.

$358 - 200 = 158,$   
so  $357 - 199 = 158$

Use Eva's method to work out the subtractions.

$3,487 - 999$

$4,407 - 1,399$

$7,643 - 5,098$

- Complete the subtractions.

$300 - 176$

$4,000 - 3,180$

$6,001 - 3,065$

Compare methods with a partner.



# Efficient subtraction

## Reasoning and problem solving

Dexter is working out  $4,387 - 134$



Those numbers are not close together, so I need to use the column method.

	Th	H	T	O
	4	3	8	7
-		1	3	4
<hr/>				
<hr/>				

Do you agree with Dexter?

Explain your reasons.

What other methods could Dexter use?

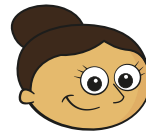


No

Dexter could have used a number line.

As there are no exchanges, he could have done the subtraction mentally.

Dora is working out  $500 - 287$



I could subtract 1 to make my calculation easier, as I will not need to do any exchanges.

	H	T	O
	4	9	9
-	2	8	7
<hr/>			
	2	1	2

What mistake has Dora made?

What is the correct answer?

How else could you work out  $500 - 287$ ?

Dora needed to subtract 1 from both numbers.

213

e.g.  $499 - 287 = 212$ ,  
 $212 + 1 = 213$   
 number lines

## Estimate answers

### Notes and guidance

In Year 3, children explored the idea of estimating without explicitly using the language of rounding. Now that children have covered rounding in Autumn Block 1, they are familiar with the language of “rounding to the nearest \_\_\_\_”. In this small step, children estimate by rounding to the nearest ten, hundred and thousand. Number lines are a useful representation to support this understanding.

Discuss why estimates are important, particularly in real-life situations such as population statistics. They allow us to quickly and easily get an idea of what an answer should be near to or if an already calculated answer is appropriate. It is important to discuss whether an actual answer will be greater or less than an estimate. For example,  $333 + 524$  may be estimated as  $300 + 500$ , and the precise answer will be greater than the estimate because both the numbers were rounded to the previous multiple.

### Things to look out for

- Children may find it difficult to decide which multiple to round to.
- Children may find it difficult to work out whether an estimate will be greater or less than the actual answer.

### Key questions

- What multiple of 10/100/1,000 comes before and after \_\_\_\_?
- Where would \_\_\_\_ be on this number line?
- Which multiple is \_\_\_\_ closer to?
- Which calculation is easier/quicker to perform? Why?
- Why do we use estimates?
- Is the estimate less than or greater than the actual answer? Why?

### Possible sentence stems

- \_\_\_\_ is closer to \_\_\_\_ than \_\_\_\_
- So \_\_\_\_ rounded to the nearest \_\_\_\_ is \_\_\_\_
- The estimate will be \_\_\_\_ than the actual answer because ...

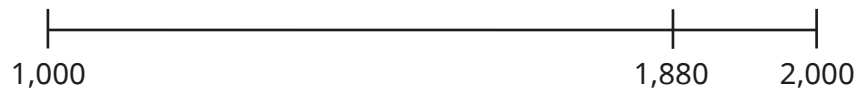
### National Curriculum links

- Estimate and use inverse operations to check answers to a calculation

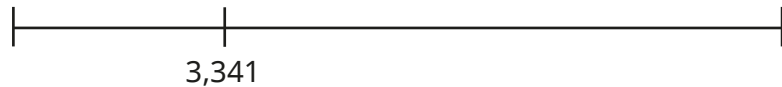
# Estimate answers

## Key learning

- Use the number lines to help you complete the sentences.



1,880 rounded to the nearest thousand is \_\_\_\_\_



3,341 rounded to the nearest thousand is \_\_\_\_\_

Use the rounded amounts to estimate  $3,341 - 1,880$

Use column subtraction to work out the actual answer.

- Write  $<$  or  $>$  to complete the statements.

$436 \bigcirc 400$

$327 + 436 \bigcirc 327 + 400$

$3,838 \bigcirc 4,000$

$8,000 - 3,838 \bigcirc 8,000 - 4,000$

$1,132 \bigcirc 1,100$

$4,000 - 1,132 \bigcirc 400 - 1,100$

What do you notice?

- Annie and Tommy are estimating the answer to  $3,219 + 5,624$

Annie: I am going to estimate by rounding each number to the nearest thousand.

Tommy: I am going to round to the nearest hundred because I will still be able to add those numbers in my head.


Use Annie and Tommy's methods to estimate the answer.  
 Now work out the actual answer using column addition.  
 Whose estimate was more accurate? Why?


- Mrs Lee has £5,000 in her bank account.  
 A TV costs £1,328  
 A car costs £3,889  
 Estimate whether Mrs Lee can afford to buy both the television and the car.  
 Does your answer change if you round to a different amount?

# Estimate answers

## Reasoning and problem solving

The children are estimating the answer to  $4,502 - 1,414$

  $4,000 - 1,000 = 3,000$   
Jack

  $4,500 - 1,400 = 3,100$   
Ron

  $5,000 - 1,000 = 4,000$   
Sam

Ron and Sam \_\_\_\_\_  
Sam's \_\_\_\_\_  
Ron's \_\_\_\_\_

Which children have rounded correctly?

What mistake has been made?

Whose calculation was easiest?

Whose estimate was most accurate?



The estimated answer to a calculation is 3,400



The numbers in the calculation were rounded to the nearest hundred for the estimate.

What could the original calculation be?

multiple possible answers, e.g.  
 $2,343 + 1,089$   
 $4,730 - 1,304$

Roll a 6-sided dice eight times.

Write each number in one of the boxes.

Now work out your addition.

	Th	H	T	O	
+					

Compare answers as a class.

Compete against a partner. Who can get an answer closest to 5,000?

# Checking strategies

## Notes and guidance

In this small step, children explore the inverse relationship between addition and subtraction. From learning in earlier years, children know that addition and subtraction are inverse operations and they should also be aware that addition is commutative and subtraction is not.

Bar models and part-whole models are useful representations to help establish families of facts that can be found from one calculation. Children use inverse operations to check the accuracy of their calculations, rather than simply redoing the same calculation and potentially repeating the same error.

Estimations can be used alongside inverse operations as an alternative checking strategy.

## Things to look out for

- Children may subtract a part from a part rather than a part from the whole, for example writing  $240 - 130$  as the inverse of  $240 + 130$
- When asked to check an answer, children may just repeat the same calculation instead of using the inverse operation.

## Key questions

- What are the parts? What is the whole?
- Given one fact, what other facts can you write?
- What does “inverse” mean?
- What is the inverse of add/subtract \_\_\_\_\_?
- Is addition/subtraction commutative?

## Possible sentence stems

- The inverse of \_\_\_\_\_ is \_\_\_\_\_
- If \_\_\_\_\_ is a part and \_\_\_\_\_ is a part, then \_\_\_\_\_ is the whole.
- If \_\_\_\_\_ is the whole and \_\_\_\_\_ is a part, then \_\_\_\_\_ is the other part.
- To check I have added/subtracted \_\_\_\_\_ correctly, I need to \_\_\_\_\_

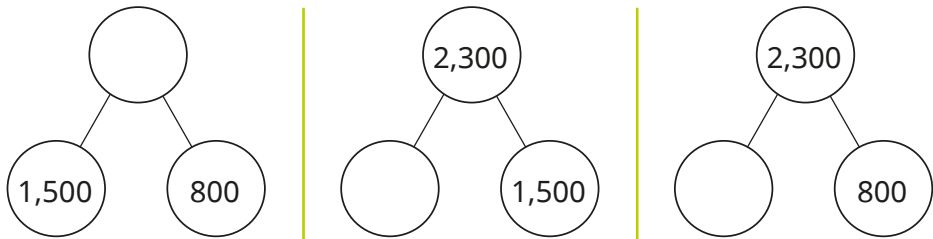
## National Curriculum links

- Estimate and use inverse operations to check answers to a calculation

# Checking strategies

## Key learning

- Complete the part-whole models and number sentences.



$1,500 + 800 = \underline{\quad}$    
  $2,300 - 1,500 = \underline{\quad}$    
  $2,300 - 800 = \underline{\quad}$

How could you check your answers?

- Complete the bar model for  $3,582 - 2,236 = 1,346$



Use the bar model to write the fact family.

- Which subtractions can be used to check the addition  $1,574 + 3,432 = 5,006$ ?

$5,006 - 3,432$    
  $5,006 - 1,574$    
  $3,432 - 1,574$    
  $1,574 - 5,006$

- Which additions can be used to check the subtraction  $3,265 - 823 = 2,442$ ?

$3,265 + 823$    
  $823 + 2,442$    
  $3,265 + 2,442$    
  $2,442 + 823$

- Use an inverse operation to check each calculation.

How many different inverse calculations can you do for each?

	Th	H	T	O
	4	5	1	9
+		7	2	3
	5	2	4	2
	1		1	

	Th	H	T	O
	3	<del>4</del> <sup>1</sup>	6	4
-	1	4	8	4
	2	0	8	0

- Dani has answered a problem.

Mr Rose has £2,358 in his bank account.  
 He spends £1,209 on a family holiday.  
 How much does he have left?    £ 1,049

Estimate to check Dani's answer.

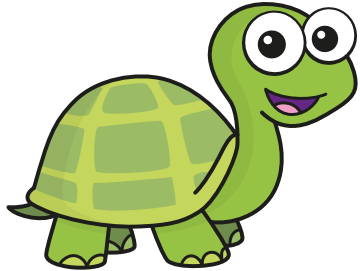
Now use an inverse calculation to check if Dani's answer is correct.

# Checking strategies

## Reasoning and problem solving

$$627 + \square = 943$$

I think the answer is 1,570



Show by estimating that Tiny has made a mistake.

What mistake has Tiny made?

Find the correct answer.

Complete an inverse operation to check your answer.



various possible estimates, e.g.

$$600 + 300 = 900$$

$$900 - 600 = 300$$

$$627 + 316 = 943$$

Tiny is completing some statements.

Check Tiny's answers.

Do you need to work out the answers or can an estimate help you decide whether Tiny is correct?

$$55 + 28 = \square - 13$$

$$55 - 28 = 13 + \square$$

$$28 + \square > 55 - 13$$

$$28 + 13 < 55 - \square$$

Find the correct answers.

Is there more than one possible answer for any of the statements?



Compare strategies as a class.

96

14

any number greater than 14

any number between 0 and 13