Autumn

Scheme of learning

Year 3

#MathsEveryoneCan

The **White Rose Maths** schemes of learning

Teaching for mastery

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

Putting number first

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

Depth before breadth

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

Working together

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

Fluency, reasoning and problem solving

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

Concrete – Pictorial – Abstract (CPA)

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

Concrete

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

Pictorial

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

Abstract

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

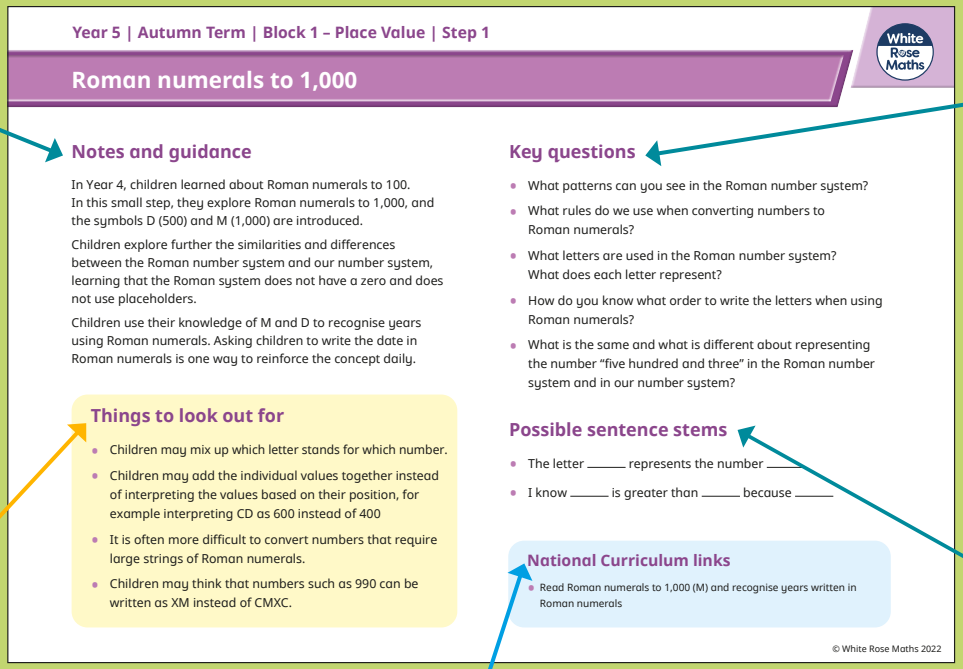
$$5 + 7$$

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

Teacher guidance

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

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



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.

Key questions

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

Things to look out for

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

Possible sentence stems

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

National Curriculum links

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

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

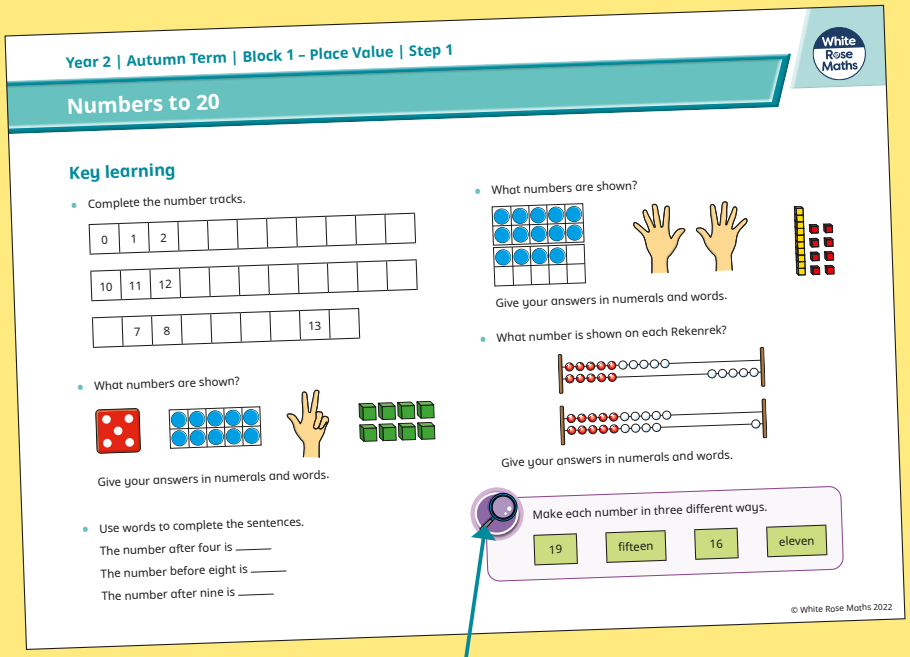
Things to look out for, which highlights common mistakes, misconceptions and areas that may require additional support.

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

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

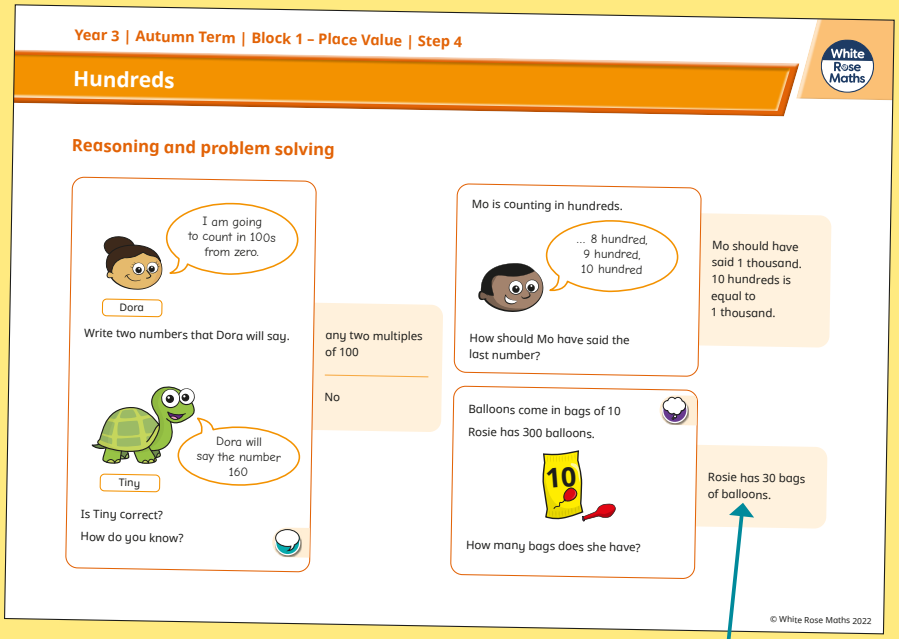
Teacher guidance

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



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.



Answers provided where appropriate

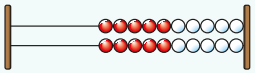
Activities and symbols

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.

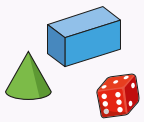
Give children a selection of buttons and ask them to sort the buttons in as many different ways as they can.

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

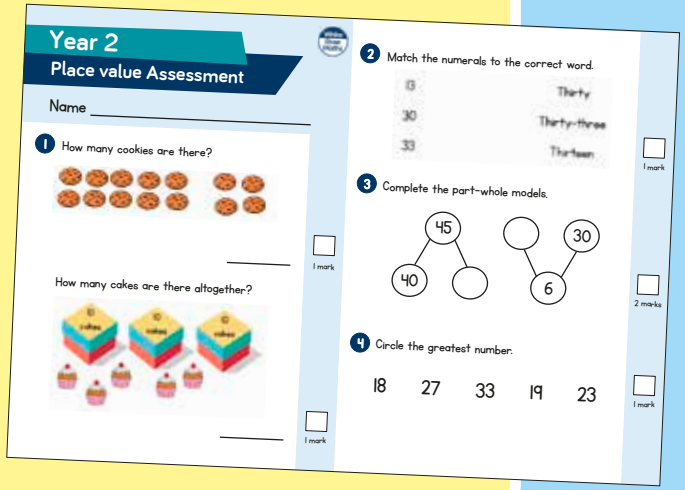
drawing a picture might help children to answer the question

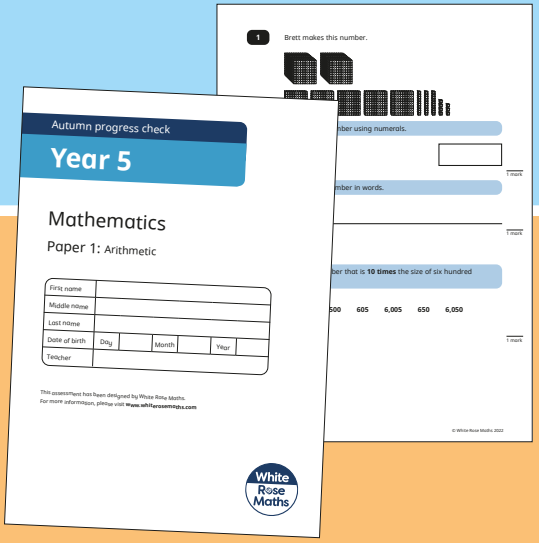
children talk about and compare their answers and reasoning

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

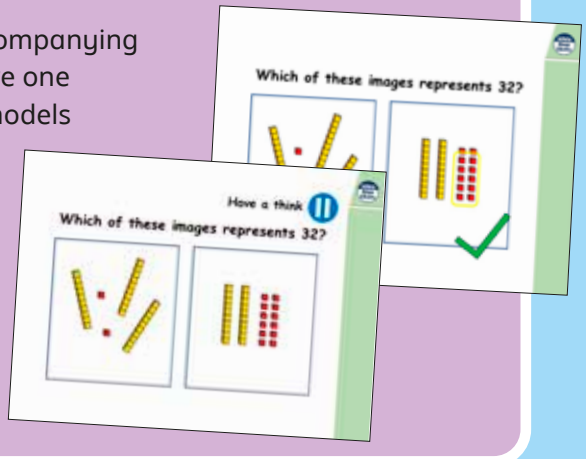
End-of-block assessments to check progress and identify gaps in knowledge and understanding.



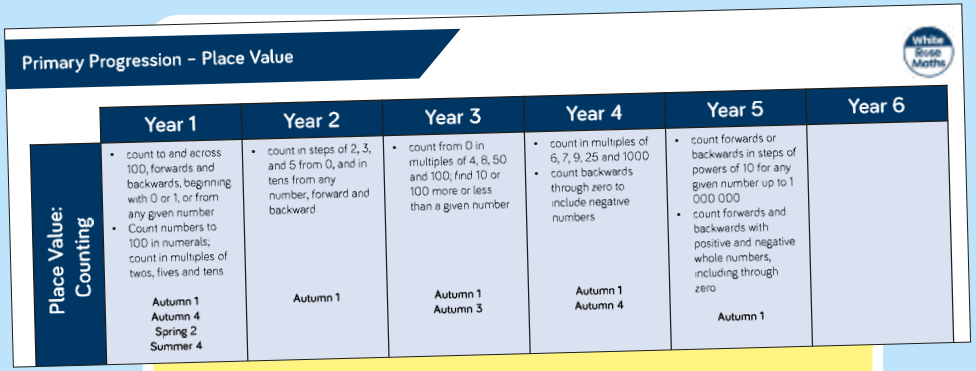


End-of-term assessments for a more summative view of where children are succeeding and where they may need more support.

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.



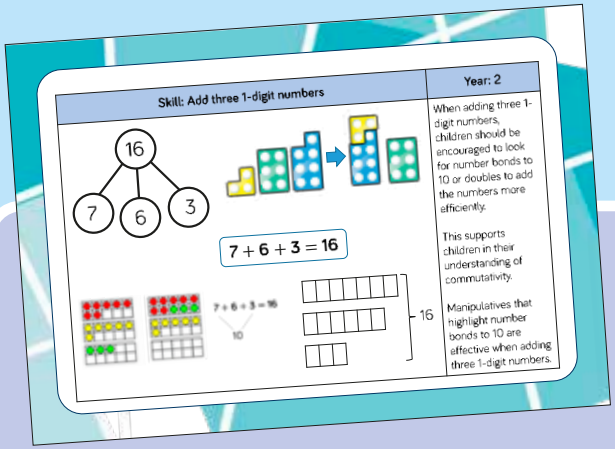
Free supporting materials



Primary Progression – Place Value

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: Counting	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • Count numbers to 100 in numerals; count in multiples of twos, fives and tens Autumn 1 Autumn 4 Spring 2 Summer 4	• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward Autumn 1	• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number Autumn 1 Autumn 3	• count in multiples of 6, 7, 9, 25 and 1000 • count backwards through zero to include negative numbers Autumn 1 Autumn 4	• count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • count forwards and backwards with positive and negative whole numbers, including through zero Autumn 1	

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

16, 7, 6, 3

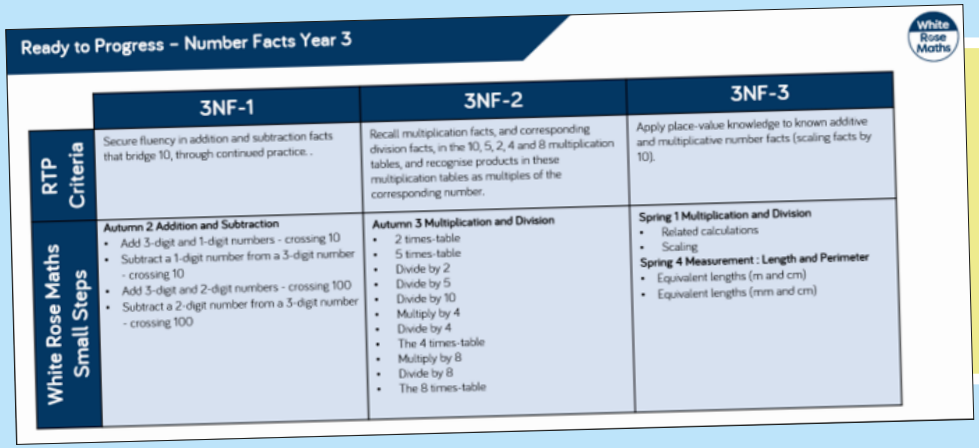
$7 + 6 + 3 = 16$

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.

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



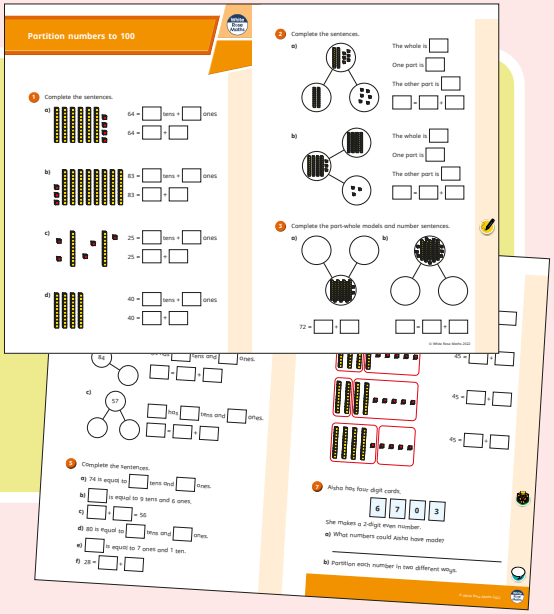
Ready to Progress – Number Facts Year 3

	3NF-1	3NF-2	3NF-3
RTP Criteria	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 known additive and multiplicative number facts (scaling facts by 10).
White Rose Maths Small Steps	**Autumn 2 Addition and Subtraction** • Add 3-digit and 1-digit numbers - crossing 10 • Subtract a 1-digit number from a 3-digit number - crossing 10 • Add 3-digit and 2-digit numbers - crossing 100 • Subtract a 2-digit number from a 3-digit number - crossing 100	**Autumn 3 Multiplication and Division** • 2 times-table • 5 times-table • Divide by 2 • Divide by 5 • Divide by 10 • Multiply by 4 • Divide by 4 • The 4 times-table • Multiply by 8 • Divide by 8 • The 8 times-table	**Spring 1 Multiplication and Division** • Related calculations • Scaling **Spring 4 Measurement : Length and Perimeter** • Equivalent lengths (m and cm) • Equivalent lengths (mm and cm)

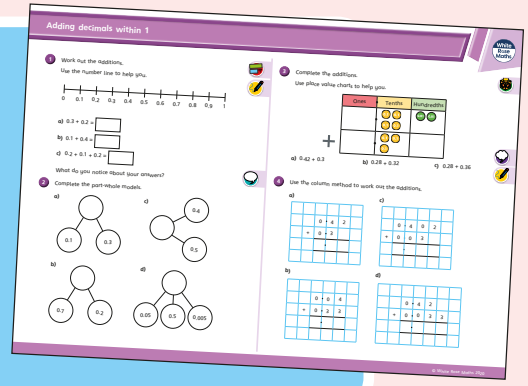
Ready to progress mapping that shows how the schemes of learning link to curriculum prioritisation.

Premium supporting materials

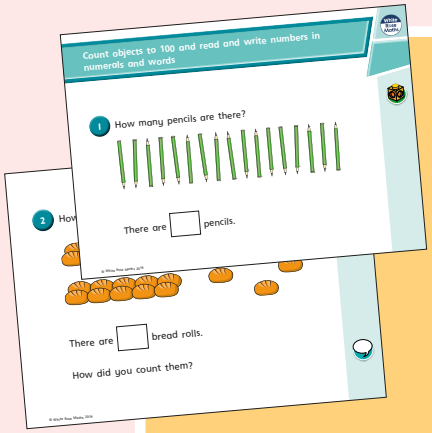
Worksheets to accompany every small step, providing relevant practice questions for each topic that will reinforce learning at every stage.



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

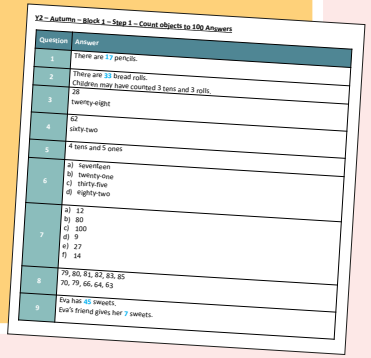


Also available as printed **workbooks**, per block.



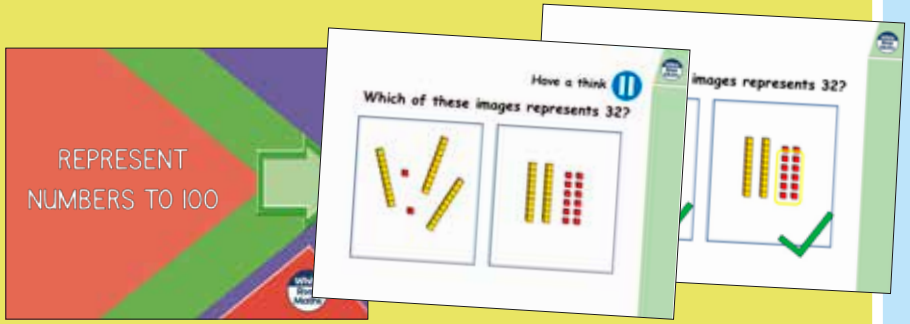
PowerPoint™ versions of the worksheet questions to incorporate them into lesson planning.

Answers to all the worksheet questions.

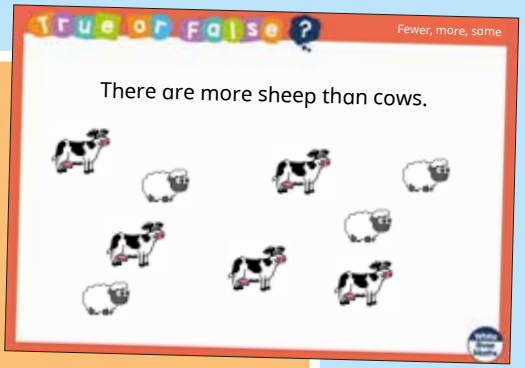


Premium supporting materials

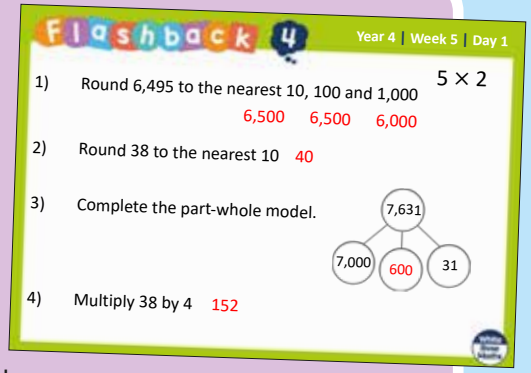
Teaching slides that mirror the content of our home learning videos for each step. These are fully animated and editable, so can be adapted to the needs of any class.

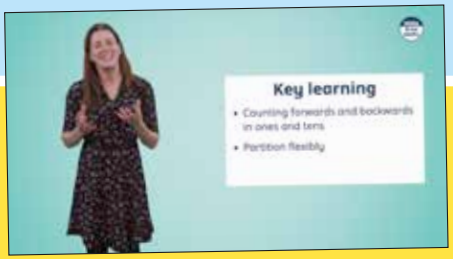


A **true or false** question for every small step in the scheme of learning. These can be used to support new learning or as another tool for revisiting knowledge at a later date.



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.





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.

Yearly overview

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

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number **Place value**			Number **Addition and subtraction**					Number **Multiplication and division A**			
Spring	Number **Multiplication and division B**			Measurement **Length and perimeter**			Number **Fractions A**			Measurement **Mass and capacity**		
Summer	Number **Fractions B**			Measurement **Money**			Measurement **Time**		Geometry **Shape**	**Statistics**		Consolidation

Autumn Block 1

Place value

Small steps

Step 1	Represent numbers to 100
Step 2	Partition numbers to 100
Step 3	Number line to 100
Step 4	Hundreds
Step 5	Represent numbers to 1,000
Step 6	Partition numbers to 1,000
Step 7	Flexible partitioning of numbers to 1,000
Step 8	Hundreds, tens and ones

Small steps

Step 9	Find 1, 10 or 100 more or less
Step 10	Number line to 1,000
Step 11	Estimate on a number line to 1,000
Step 12	Compare numbers to 1,000
Step 13	Order numbers to 1,000
Step 14	Count in 50s

Represent numbers to 100

Notes and guidance

Children have already represented numbers to 100 in Year 2. This small step provides the opportunity to revisit and consolidate their learning before moving on to numbers beyond 100

The main focus of this step is to ensure that children get a sense of the size of numbers to 100 and can see clearly the number of tens and ones each number is made up of. Children should be confident using a range of manipulatives, such as straws, a bead string and base 10, alongside their own drawings and jottings. Place value counters are not used in this particular small step, as they do not show the relative sizes of numbers, and children cannot see that 1 ten is made up of 10 ones.

Things to look out for

- Children may count 1 ten as 1 rather than 10
  Using bundles of straws is useful here as children can physically count out 10 ones and then bundle them to make 1 ten.
- When asked to draw, children can often draw too much detail. Ensure you give clear instructions, for example a line means 1 ten; a dot means 1 one.
- Children may not recognise that when there are 10 or more ones they need to make an exchange.

Key questions

- How have the beads been grouped? How does this help you to count?
- Is it quicker to count in ones or tens?
- How many tens do you have? How many ones do you have?
- How many ones make 1 ten?
- How else can you show this number?

Possible sentence stems

- There are _____ tens and _____ ones.
  The number is _____
- The _____ represents _____ groups of ten.
  The _____ represents _____ extra ones.

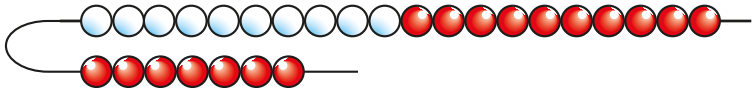
National Curriculum links

- Identify, represent and estimate numbers using different representations

Represent numbers to 100

Key learning

- Here is part of a bead string.



Complete the sentences.

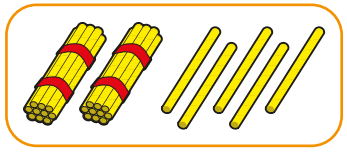
There are _____ tens.

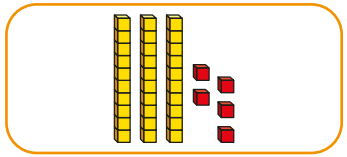
There are _____ ones.

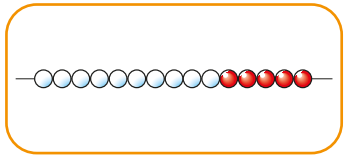
The number is _____

Represent 45 on a bead string and complete the same sentences.

- Match the pictures to the numbers.







1 ten and 5 ones

thirty-five

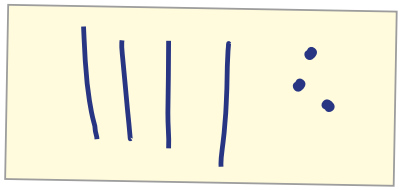
25

- Complete the sentences for the number 67

There are _____ tens.

There are _____ ones.

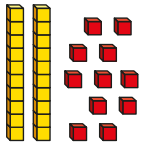
- Dora has used lines and dots to draw the number 43

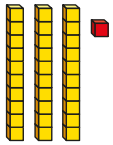


Use lines and dots to draw each number.

26	52	74

- These two numbers are the same.





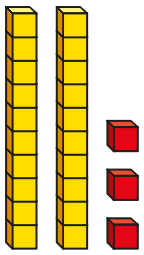
Explain why.

Represent numbers to 100

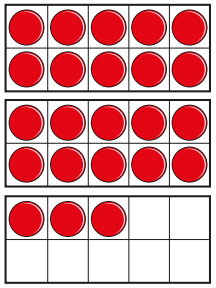
Reasoning and problem solving

Which picture does **not** show 23?

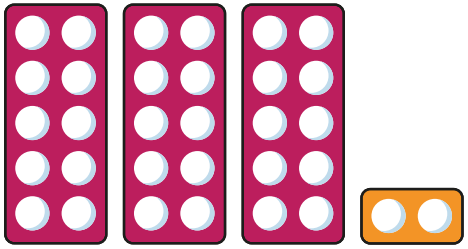
A



B



C



How do you know?

C does not show 23, it shows 32

Here are three digit cards.

7	0	2

List the 2-digit numbers that can be made using these digit cards.

20, 27, 70, 72

What is the greatest 2-digit number you can make?

72

What is the smallest 2-digit number you can make?

20

Why can the zero not be used for the number of tens?

Partition numbers to 100

Notes and guidance

In this small step, children learn what each digit represents when partitioning a number. Concrete resources are useful to help children physically explore this, as they can break a number apart and put it back together. Part-whole models can be used alongside these resources, to represent the number and its parts.

It is important that children can partition numbers into tens and ones, for example 58 has 5 tens and 8 ones. They should be able to write this as an addition sentence such as 58 = 50 + 8

Children who are confident with partitioning in this way could begin to partition flexibly, for example 58 is made up of 5 tens and 8 ones, or 4 tens and 18 ones, or 2 tens and 38 ones, and so on.

Things to look out for

- When representing a 2-digit number, children may not understand that tens and ones have a different value. For example, they may use 5 ones to represent 50 instead of using 5 tens.
- Children may complete a part-whole model or number sentence incorrectly, forgetting the zero that is needed to represent tens, for example 58 = 5 + 8 instead of 58 = 50 + 8
- Representations may be interpreted incorrectly, for example 40 + 2 = 402

Key questions

- Which part do you know? How can you use the whole and this part to work out the missing part?
- How can you use base 10 or draw a picture to help you partition?
- How can you complete the part-whole model in a different way?

Possible sentence stems

- There are _____ tens and _____ ones.

  The number is _____
- The whole is _____

  One part is _____. The other part is _____
- _____ tens and _____ ones is the same as _____ tens and _____ ones.

National Curriculum links

- Recognise the place value of each digit in a 3-digit number (hundreds, tens, ones)

Partition numbers to 100

Key learning

- Here is a part-whole model.

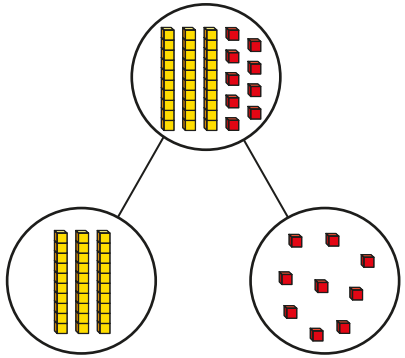
  Complete the sentences.

  The whole is _____

  One part is _____

  The other part is _____

  _____ = _____ + _____



- Draw base 10 in a part-whole model to show the number.

The whole is 42 One part is 40. The other part is 2

  Complete the number sentence.

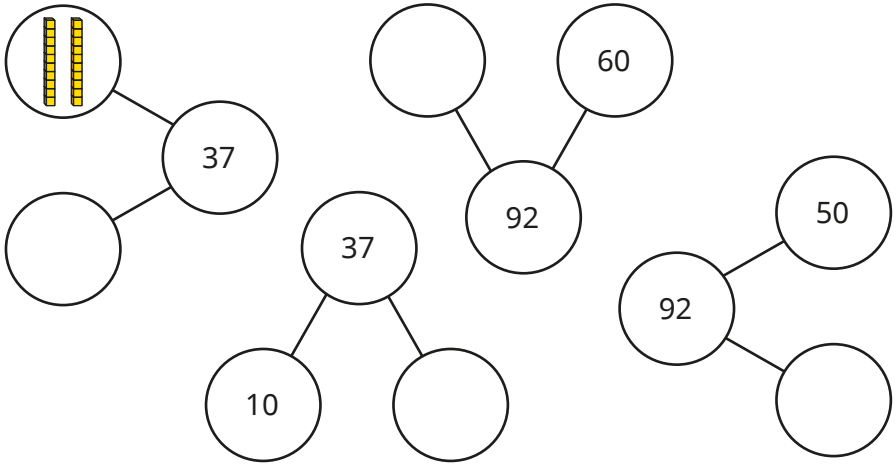
  _____ = _____ + _____

- Match the partitions to the numbers.

20 + 19	10 + 4	40 + 0	90 + 3
40	14	93	39

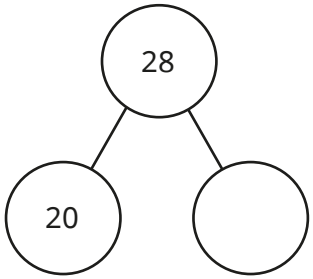
- Complete the sentences.
  - 67 has _____ tens and _____ ones. 67 = _____ + _____
  - 91 has _____ tens and _____ ones. 91 = _____ + _____

- Complete the part-whole models.



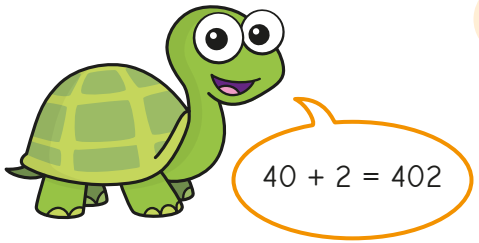
- Complete the part-whole model.

  Write four number sentences for the part-whole model.



Partition numbers to 100

Reasoning and problem solving



Explain the mistake Tiny has made.

Use base 10 to show the correct answer.

40 + 2 = 42

Fill in the missing numbers.

1 ten + 3 ones = 13

2 tens + _____ ones = 23

3 tens + 3 ones = _____

_____ tens + 3 ones = 43

Can you see a pattern?

What will the next number sentence be?

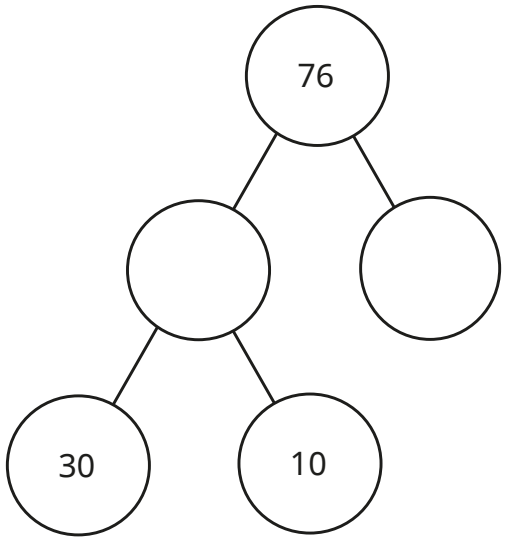
3 ones

33

4 tens

5 tens + 3 ones = 53

Complete the part-whole model.



40, 36

Number line to 100

Notes and guidance

In this small step, children revisit learning from Year 2, looking at the number line to 100

It is important that children explore a variety of examples within 100, including number lines that do not start from zero and number lines with increments other than 1 or 10

Children identify or estimate the position of a given number on a number line, understanding why they can accurately position numbers that lie exactly on a division, but the position of numbers within an interval can only be estimated.

When children are identifying and/or estimating the position of a number on a number line, encourage them to label the divisions to support their thinking.

Things to look out for

- Children may assume that all number lines count in 1s or 10s and hence incorrectly label the divisions.
- Children may count the number of divisions, rather than the intervals.
- Children may incorrectly count the number of intervals and therefore label the positions of numbers incorrectly.

Key questions

- What is the start point? What is the end point?
- How many intervals are there? What is each interval worth?
- What is the number line counting up in? How do you know?
- Where would _____ be on the number line? How do you know?
- Why can you only estimate the position of _____ on the number line?

Possible sentence stems

- The start point is _____ and the end point is _____
- There are _____ intervals on the number line.
- Each interval is worth _____
- The number line is counting up in _____

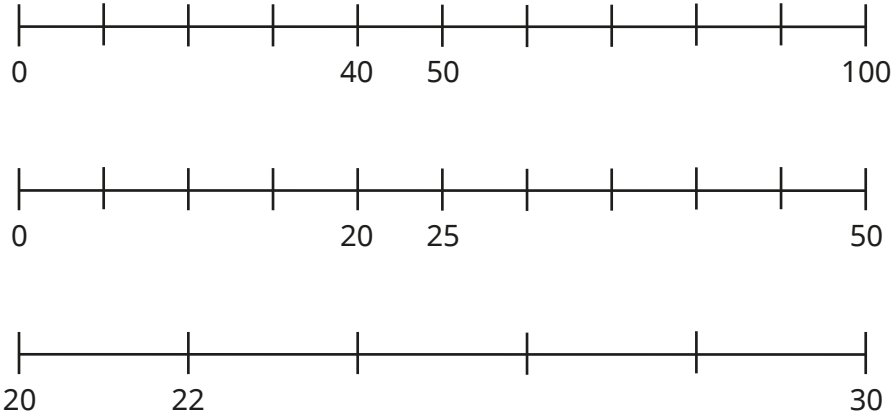
National Curriculum links

- Count from zero in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- Identify, represent and estimate numbers using different representations

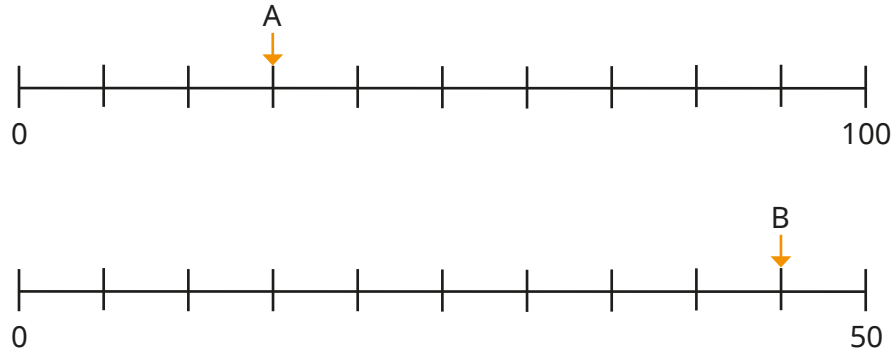
Number line to 100

Key learning

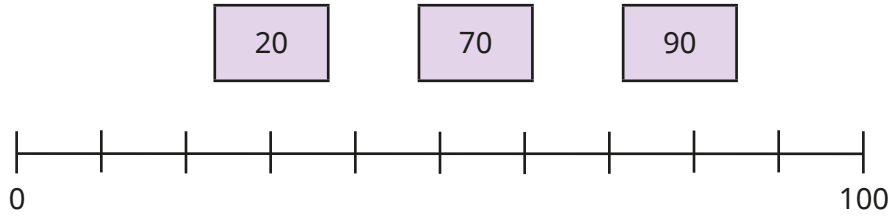
- Complete the number lines.



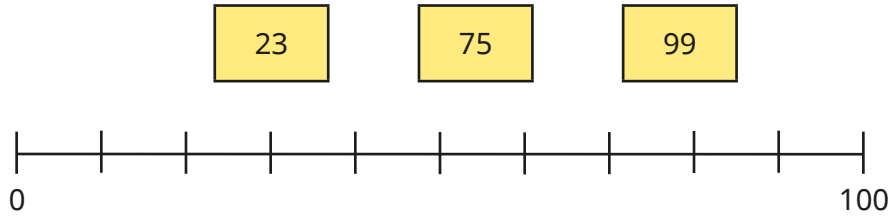
- What numbers are the arrows pointing to?



- Draw an arrow to show where each number belongs on the number line.

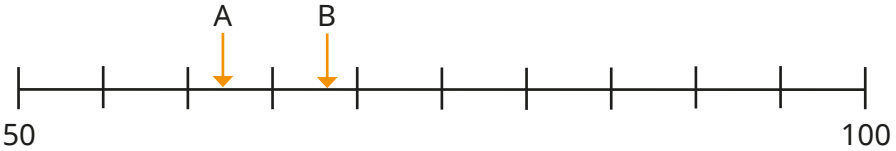


- Draw an arrow to estimate where each number belongs on the number line.



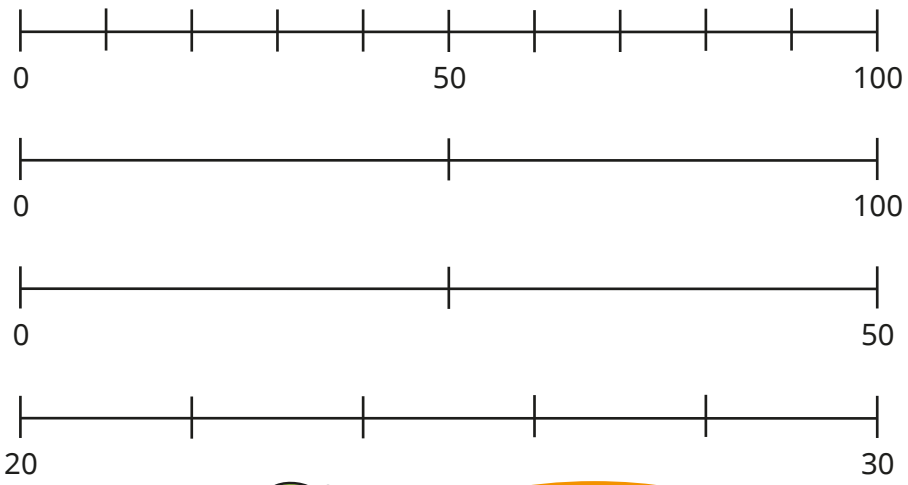
Why can you only estimate where each number belongs?

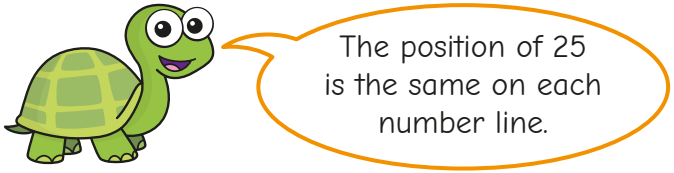
- Estimate the numbers the arrows are pointing to.



Number line to 100

Reasoning and problem solving



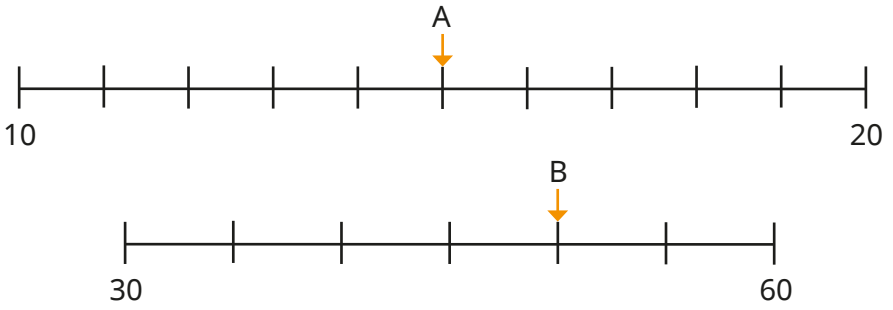


Do you agree with Tiny?

Explain your answer.

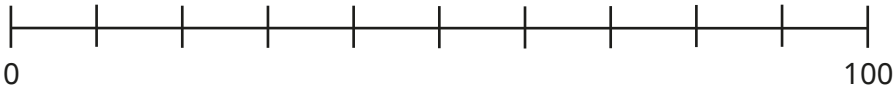
No

What numbers are the arrows pointing to?

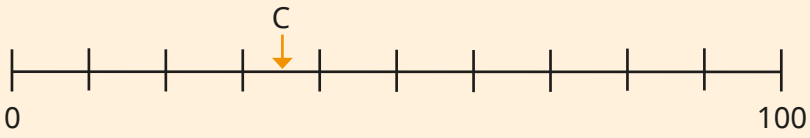


A + B + C = 100

Draw an arrow to estimate where C belongs on the number line.



A = 15 B = 50



Hundreds

Notes and guidance

In Year 2, and previous small steps, children have counted in tens within 100. This small step provides the opportunity to explore 100 explicitly for the first time. Children should be able to confidently count in 100s before looking at the structure of 100

By the end of this small step, children should understand that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10. They will then use this knowledge to explore other multiples of 100 within 1,000

By unitising the hundred, children should be able to state the number of tens that make up any 3-digit multiple of 100. Base 10 can be used to support understanding, allowing children to see the tens making up each hundred.

Things to look out for

- Children may not recognise or distinguish between a 10 piece and a 100 piece in base 10, and count each piece as "1"
- Children may not be using the most efficient method of counting.
- Children may not be using placeholders when writing numbers in numerals.

Key questions

- When counting in 10s, what number comes after 90?
- If you count from zero in 100s, will you say 40?
- When counting in 100s, what comes after 500?
  How do you know?
- How many tens are there in 100?
- If there are 10 tens in 100, how many tens are there in 200?
- How does the base 10 show that 100 is 10 times the size of 10?

Possible sentence stems

- There are _____ tens in 100 and _____ hundreds in _____

  This means there are _____ tens in _____

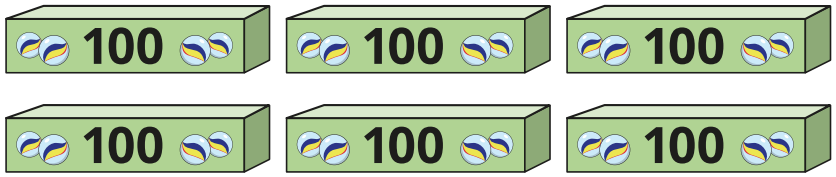
National Curriculum links

- Count from zero in multiples of 4, 8, 50 and 100
- Identify, represent and estimate numbers using different representations
- Read and write numbers up to 1,000 in numerals and words

Hundreds

Key learning

- How many marbles are there?

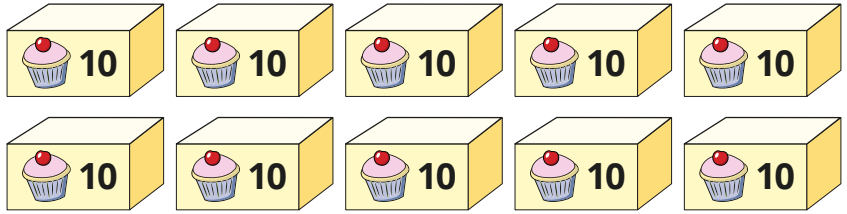


Write your answer in numerals and in words.

- Complete the number track.

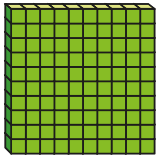
		200	300		500			800	

- How many cupcakes are there?

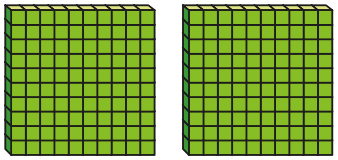


Write your answer in numerals and in words.

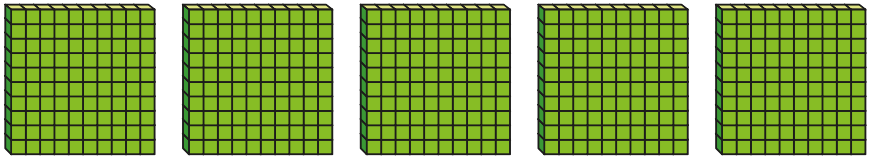
- How many tens are there in 100?



- How many tens are there in 200?



- Complete the sentences to describe the number.



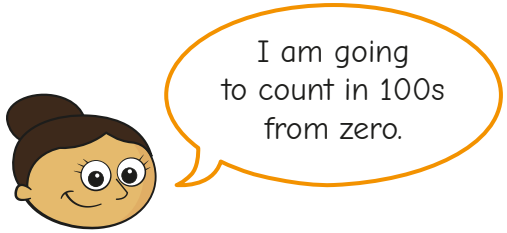
There are _____ tens in 100

There are _____ hundreds in 500

There are _____ tens in 500

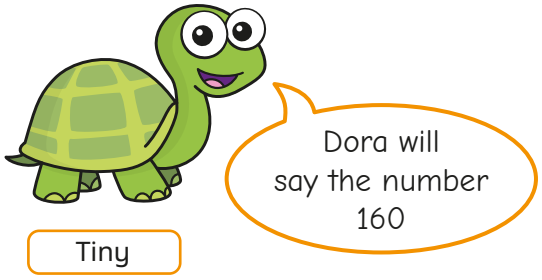
Hundreds

Reasoning and problem solving



Write two numbers that Dora will say.

any two multiples of 100

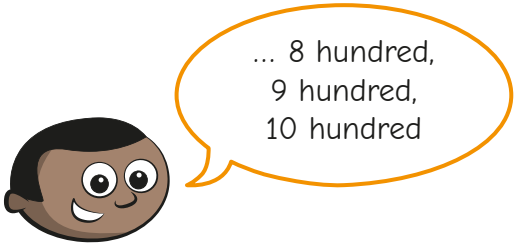


Is Tiny correct?

How do you know?

No

Mo is counting in hundreds.

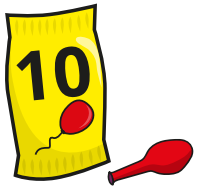


How should Mo have said the last number?

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

Balloons come in bags of 10

Rosie has 300 balloons.



How many bags does she have?

Rosie has 30 bags of balloons.

Represent numbers to 1,000

Notes and guidance

In this small step, children build on their learning from Year 2, and the earlier steps in this block, to represent numbers to 1,000

They use base 10 as the main concrete representation, along with a variety of pictorial representations. Using base 10 helps children to see that hundreds are 10 times the size of tens, in the same way that tens are 10 times the size of ones. Building numbers in a variety of ways emphasises these relationships.

Children need to see numbers with zeros in different columns and be able to represent these using both concrete and pictorial representations. The idea of a placeholder is explicitly addressed in the next small step.

Things to look out for

- Children may write numbers incorrectly, for example writing 423 as 400203
- Children may not understand the value of each part of a number, for example confusing 240 and 204
- Children may miscount the number of hundreds, tens and ones in a number.
- Children may have difficulty exchanging when representations show more than ten of one part of a number.

Key questions

- What is the value of each of the base 10 pieces?
- How many hundreds are in the number? How many tens are in the number? How many ones are in the number?
- Why do you need to make an exchange when you have 12 tens?
- Does the order in which you build the number matter?
- How else can you represent the number?

Possible sentence stems

- There are _____ hundreds, _____ tens and _____ ones.
  The number is _____
- _____ is made up of _____ hundreds, _____ tens and _____ ones.

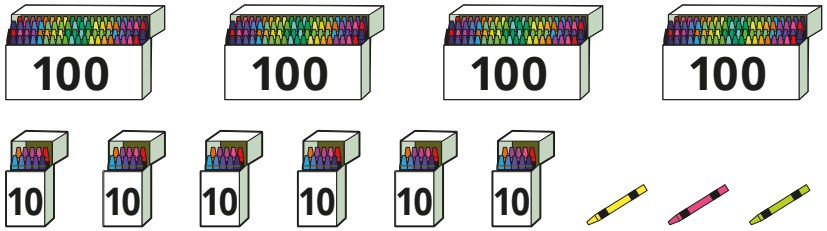
National Curriculum links

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

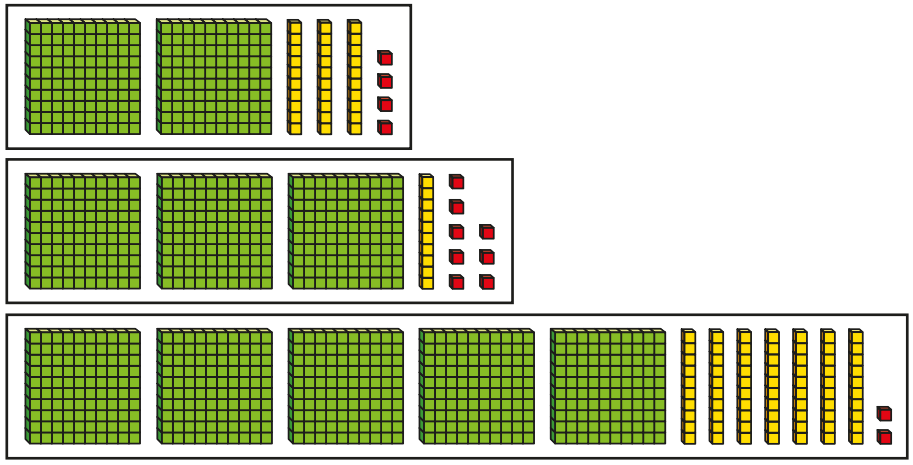
Represent numbers to 1,000

Key learning

- How many crayons are there?



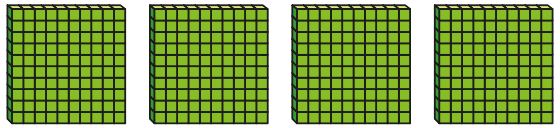
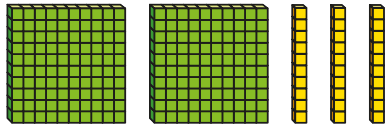
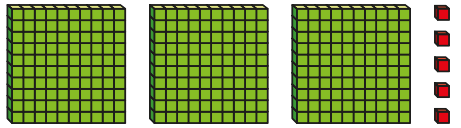
- What numbers are shown?



- Use base 10 to show each number.

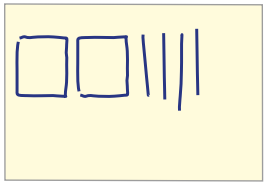
700	120	407	999

- Complete the table.

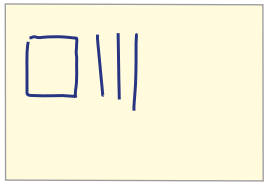
Base 10	Number
	
	
	

- Alex is drawing numbers.
  Complete each of her drawings.

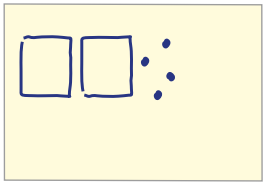
246



390



706

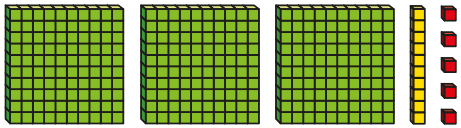


Represent numbers to 1,000

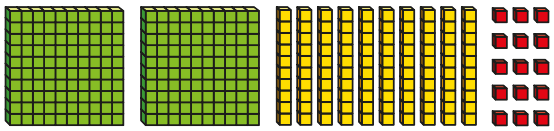
Reasoning and problem solving

Who has made the number 315?

Dora



Mo

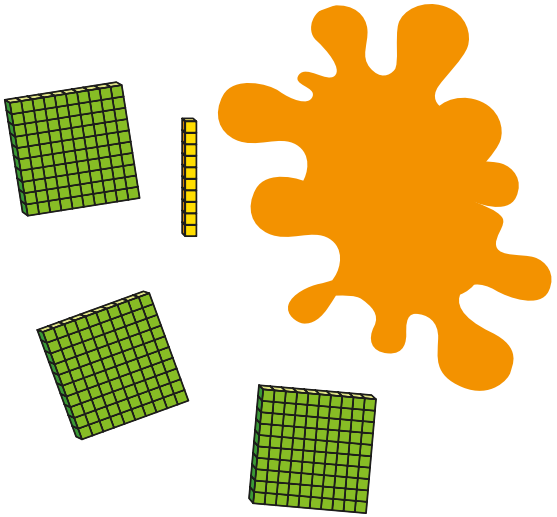


Explain how you know.

Dora and Mo have both made the number 315

Teddy has used base 10 to make the number 420

Some of the base 10 pieces are covered up.



Work out the amount that is covered up.

Find some different ways you can make the missing amount using base 10

110

multiple possible answers, e.g.

1 hundred and 1 ten

11 tens

10 tens and 10 ones

50 ones and 6 tens

Partition numbers to 1,000

Notes and guidance

In this small step, children partition numbers 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 a part-whole model as support where needed, and identify the number of hundreds, tens and ones in a 3-digit number. Examples that include zero as a placeholder should be explicitly looked at to build on learning from the previous step. Children should be able to identify the value of any given digit in a 3-digit number.

Base 10 can 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 423 = 4 + 2 + 3
- Where the parts of a part-whole model are not given in value order, children may incorrectly interpret the number.
- Children may be confused by the language relating to place value, for example saying that 423 has 20 tens rather than 2 tens.
- Children may omit zeros needed as placeholders.

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 6 in 465?

Possible sentence stems

- There are _____ hundreds, _____ tens and _____ ones.
  The number is _____
- _____ has _____ hundreds, _____ tens and _____ ones.
  _____ = _____ + _____ + _____

National Curriculum links

- Read and write numbers up to 1,000 in numerals and in words
- Recognise the place value of each digit in a 3-digit number (hundreds, tens, ones)

Partition numbers to 1,000

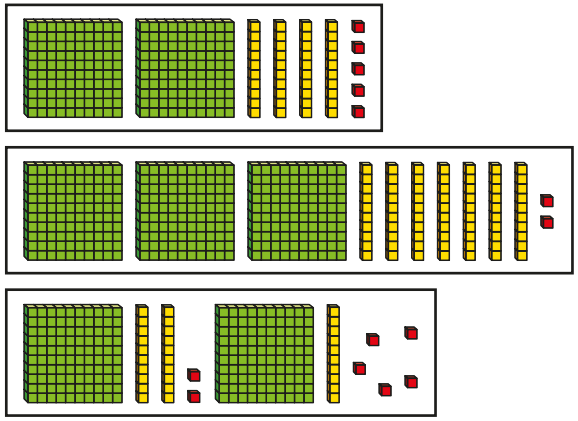
Key learning

- Complete the sentences to describe each number.

  There are _____ hundreds, _____ tens and _____ ones.

  The number is _____

  _____ = _____ + _____ + _____



- Use base 10 to make each number.

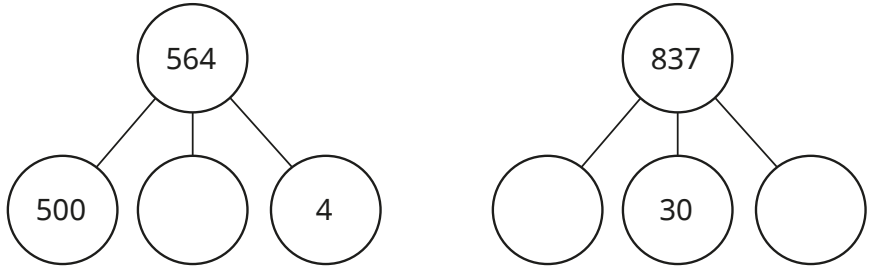
259	340	506	400

  Complete the sentences to describe each number.

  There are _____ hundreds, _____ tens and _____ ones.

  _____ = _____ + _____ + _____

- Complete the part-whole models.



- Complete the number sentences.
  - 847 = 800 + 40 + _____
  - 615 = _____ + 10 + 5
  - 324 = 300 + _____ + _____
  - 560 = 500 + _____
  - _____ = 400 + 70 + 9
  - _____ = 300 + 2

- What is the value of the hundreds digit in 864?

  What is the value of the ones digit in 72?

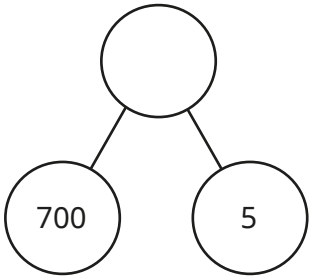
  What is the value of the tens digit in 530?

  Write in numerals the number that has 7 hundreds, 2 tens and 1 one.

Partition numbers to 1,000

Reasoning and problem solving

Tiny is completing a part-whole model.

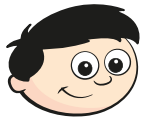


Explain the mistake that Tiny has made.

What is the whole?

705

Dexter has made a 3-digit number using base 10



What number could Dexter have made?

Compare answers with a partner.

152, 251, 350

Use the digit cards to make a 3-digit number.

3	7	8

Partition your number into hundreds, tens and ones.

Compare answers with a partner.

How many numbers can you find?

various possible answers, e.g. 378 = 300 + 70 + 8

378 has 3 hundreds, 7 tens and 8 ones

Flexible partitioning of numbers to 1,000

Notes and guidance

In the previous step, children partitioned numbers up to 1,000 in the standard way, considering how many hundreds, tens and ones were in each number. In this small step, children build on this understanding and begin to partition numbers flexibly.

Children learn that a number can be broken apart, or partitioned, in a variety of different ways. Base 10 and part-whole models are particularly useful here, as children can experiment with different ways of partitioning and record their results. Challenge children to partition the same number in two, three, four and five parts.

Being able to flexibly partition a number will support children later in the year when performing calculations that require an exchange.

Things to look out for

- Without the support of concrete resources, children can find this concept difficult. Ensure children have access to concrete resources for support in working out and checking answers.
- Children may be confident experimenting with different amounts of full hundreds, tens and ones such as 452 = 300 + 100 + 40 + 10 + 2, but struggle when partitioning numbers further such as 452 = 340 + 110 + 2

Key questions

- Can you partition the number in more than one way?
- How do you write a number that has zero tens?
- How do you write a number that has zero ones?
- Explain why 300 = 200 + 100
- Is 200 + 100 + 50 + 16 equal to 300 + 60 + 6? How do you know?
- What number is made of 3 hundreds and 15 tens?

Possible sentence stems

- _____ hundreds can be partitioned into _____ hundreds and _____ hundreds.
- _____ tens can be partitioned into _____ tens and _____ tens.
- _____ can be partitioned into _____, _____ and _____

  _____ = _____ + _____ + _____

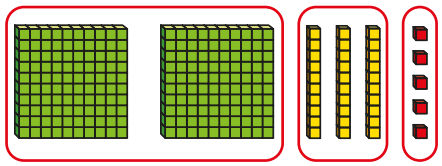
National Curriculum links

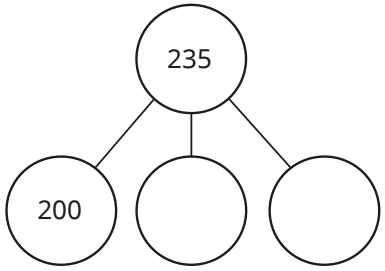
- Read and write numbers up to 1,000 in numerals and in words
- Recognise the place value of each digit in a 3-digit number (hundreds, tens, ones)

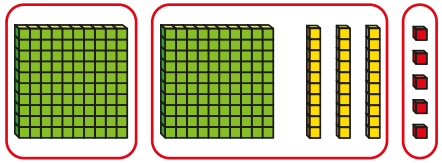
Flexible partitioning of numbers to 1,000

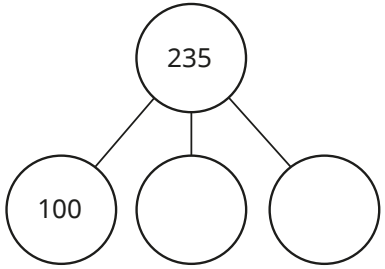
Key learning

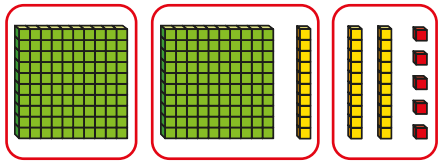
- Complete the part-whole models to match each picture.

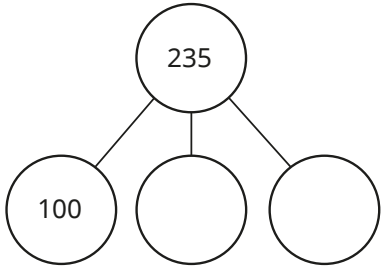










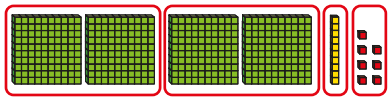


Is it possible to partition 235 in any other ways?

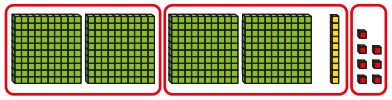
Is it possible to partition 235 into more than three parts?

- Here is the number 417 partitioned in three different ways.

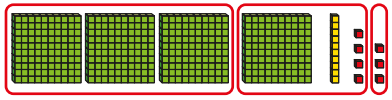
  Draw a part-whole model and complete the number sentence for each.



417 = ____ + ____ + ____ + ____



417 = ____ + ____ + ____



417 = ____ + ____ + ____

  Find another way to partition 417

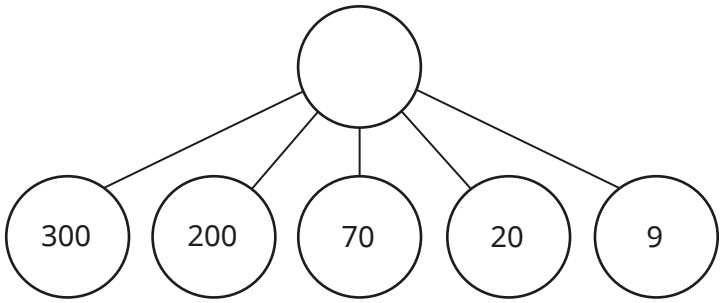
  Draw a part-whole model and write a number sentence for your partition.

- Complete the number sentences.
  - 625 = 500 + _____ + 20 + 5
  - 430 = 100 + _____ + 30
  - 701 = _____ + 201
  - 701 = 301 + _____
  - 937 = 900 + 20 + _____
  - 259 = 100 + _____ + 39

Flexible partitioning of numbers to 1,000

Reasoning and problem solving

What is the whole?



599

Partition 367 in five different ways.

Compare answers with a partner.

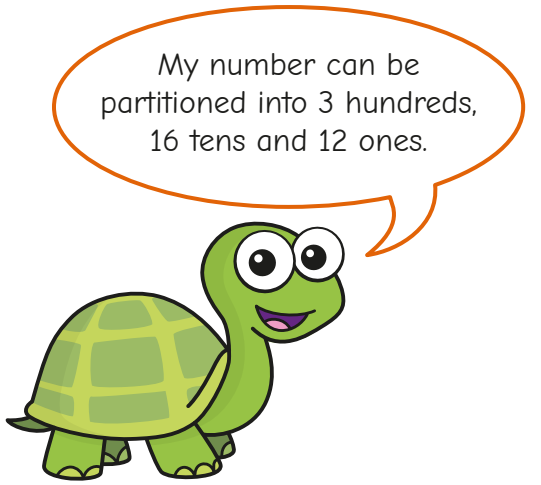
What is the same? What is different?

multiple possible answers, e.g.

200 + 160 + 7

220 + 130 + 17

Tiny is thinking of a number.



Complete the number sentence to partition Tiny's number in a different way.

_____ = _____ + _____ + _____+ _____

multiple possible answers, e.g.

472 = 100 + 200 + 170 + 2

Hundreds, tens and ones

Notes and guidance

In this small step, children look at the structure of a number by considering how many hundreds, tens and ones it is made up of. As part of this, they are introduced to place value counters for the first time. Children should be encouraged to consider the similarities and differences between more familiar concrete resources, such as base 10, and place value counters.

By describing numbers such as 253 as being made up of 2 hundred counters, 5 ten counters and 3 one counters, children can more easily begin to think of this as 2 hundreds, 5 tens and 3 ones.

This is the first time children will see a place value chart that has a hundreds column, so this will need formally introducing.

Things to look out for

- When working with place value counters, the fact that the physical size of the object does not reflect its value may cause some difficulties.
- Children may place counters in the wrong columns of a place value chart.
- Children may think that plain counters cannot be used to represent a number in a place value chart because they do not have a value.

Key questions

- What is the same about representing a number using base 10 and using place value counters? What is different?
- How do you know the value of the counter?
- How do you know which column to place the counter in?
- How many hundreds, tens and ones is _____ made up of?
- How can you use plain counters to represent a number in a place value chart?

Possible sentence stems

- _____ can be made using _____ hundred counters, _____ ten counters and _____ one counters.
- _____ is made up of _____ hundreds, _____ tens and _____ones.

National Curriculum links

- Read and write numbers up to 1,000 in numerals and in words
- Recognise the place value of each digit in a 3-digit number (hundreds, tens, ones)

Hundreds, tens and ones

Key learning

- Use base 10 to make 235

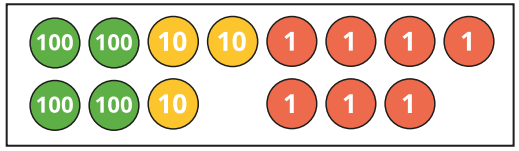
  Use place value counters to make 235

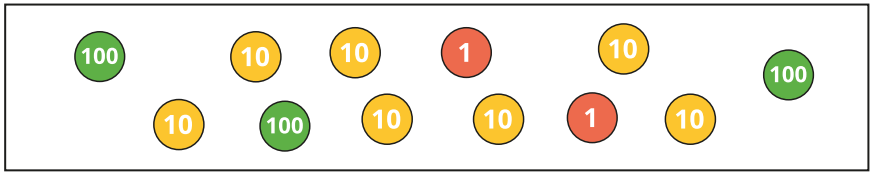
  What is the same? What is different?

  How many pieces of base 10 did you use?

  How many counters did you use?

- What numbers are shown?

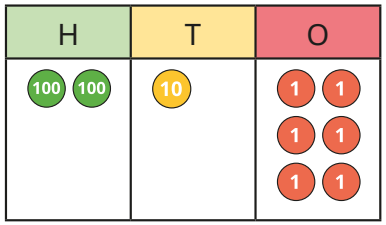


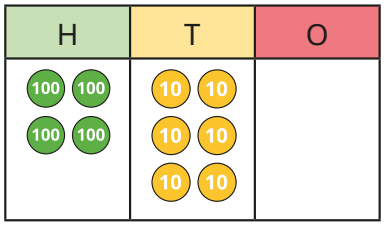


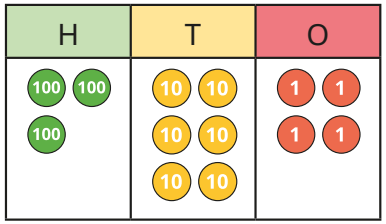
- Make the numbers using place value counters.

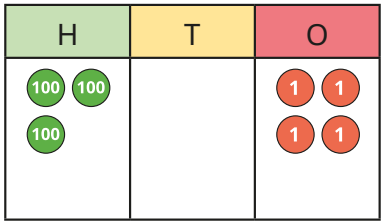
251	316	250	306	470

- What numbers are shown?









How many hundreds are there in each number?

How many tens are there in each number?

How many ones are there in each number?

- Use a place value chart to help you describe each number.

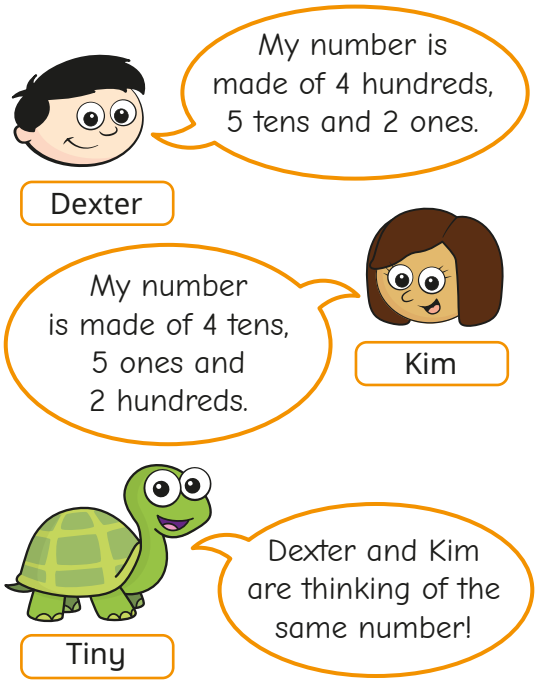
243	615	907	840

_____ is made up of _____ hundreds, _____ tens and _____ ones.

Hundreds, tens and ones

Reasoning and problem solving

Dexter and Kim are each thinking of a number.



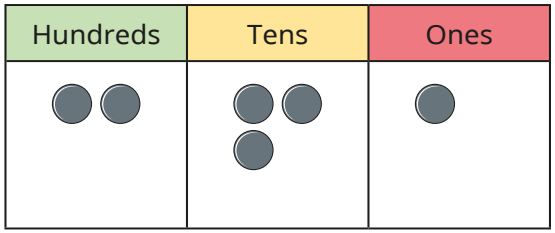
Explain the mistake Tiny has made.

What numbers are Dexter and Kim thinking of?

Tiny has not noticed the parts are in a different order.

Dexter: 452

Kim: 245



What number is represented in the place value chart?

How many hundreds, tens and ones are there?

What other numbers can be made using exactly six counters?

How many hundreds, tens and ones are there in each number?

231

2 hundreds, 3 tens and 1 one

multiple possible answers, e.g.

6, 42, 150, 141, 132, 123, 114, 105, 240, 222, 213, 330

Find 1, 10 or 100 more or less

Notes and guidance

In Year 2, children found 1 more and 1 less than a given number. In this small step, they find 1, 10 or 100 more or less than a given number.

The use of concrete resources supports understanding, as children can see "more" or "less" as physically adding or removing pieces of equipment. Take this opportunity to revisit place value counters and charts that were introduced earlier in the block, in order for children to recognise the effect that finding 1, 10 or 100 more or less has on this representation.

Things to look out for

- Children may struggle when the result of finding 1, 10 or 100 more or less crosses a boundary within the number. For example, 10 more than 297 is 307. The concept of an exchange should be reinforced here.
- In questions such as "10 more than _____ is 297", children may find 10 more than 297
- When calculating 1, 10 and 100 more or less than a number, children may not refer to the original starting number and instead find 1 more, then 10 more than the result and so on.

Key questions

- How can you show this using base 10?
- How can you show this using a place value chart?
- When finding 1/10/100 more/less, which place value columns does this effect?
- Which digit(s) changes when you find 10 more?
- What is the same and what is different about finding 1/10/100 more and 1/10/100 less?

Possible sentence stems

- _____ more/less than _____ is _____
- _____ is _____ more/less than _____
- When finding _____ more/less than a number, the _____ digit(s) changes.

National Curriculum links

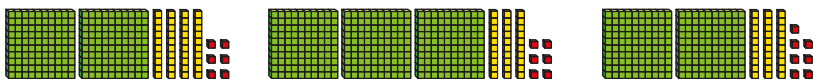
- Count from zero in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- Recognise the place value of each digit in a 3-digit number (hundreds, tens, ones)

Find 1, 10 or 100 more or less

Key learning

- Here are three numbers shown in base 10

A **B** **C**



Which picture shows 1 more than 236?

What is 1 more than 236?

Which picture shows 10 more than 236?

What is 10 more than 236?

Which picture shows 100 more than 236?

What is 100 more than 236?

Explain your answers.

- The place value chart shows the number 425

H	T	O
100 100 100 100	10 10	1 1 1 1 1

What is 1 less than 425?

What is 10 less than 425?

What is 100 less than 425?

- Here are three numbers.

550 724 302

Find 10 more and 10 less than each number.

Find 100 more and 100 less than each number.

Which numbers were the hardest to find?

- Complete the tables.

10 less	Number	10 more

100 less	Number	100 more
100 100 10 10 1		100 100 100 10 10 1
	100 1	

Find 1, 10 or 100 more or less

Reasoning and problem solving

Jack is thinking of a number.

10 more than my number is equal to 100 less than 320

What is Jack's number?

Explain your thinking.

210

One counter has fallen off the place value chart.

Hundreds	Tens	Ones
● ● ●		●

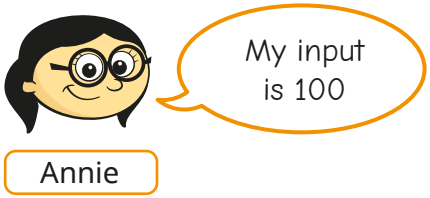
What could the number have been?

401

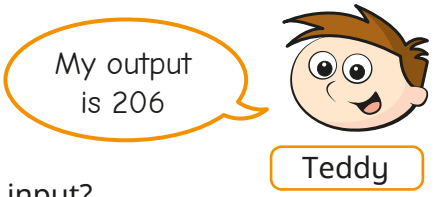
311

302

Annie and Teddy are using a function machine.



What is Annie's output?



What is Teddy's input?

11

295

Number line to 1,000

Notes and guidance

In this small step, children build on their understanding of number lines and focus on using the number line to 1,000

Children read and interpret exact values positioned along the number line. There is no need at this stage to estimate the position or value of numbers on a number line, as this will be covered in the next small step.

Children are exposed to a variety of number lines, both to and within 1,000 and with different start and end point values, and can work confidently with these. Remind children of the benefit of always starting by labelling the divisions on their number line.

Things to look out for

- Children may assume that all number lines count in 1s, 10s or 100s and hence incorrectly label the divisions.
- Children may count the number of divisions, rather than the intervals.
- Children may incorrectly count the number of intervals and therefore label the positions of numbers incorrectly.
- Children may just look at the end point of the number line rather than both the start and end to find the difference.

Key questions

- What is the start point? What is the end point?
- How many intervals are there? What is each interval worth?
- What is the number line counting up in? How do you know?
- Where would _____ be on the number line? How do you know?
- What number would be halfway along the number line? How do you know?

Possible sentence stems

- The start point is _____ and the end point is _____
- There are _____ intervals on the number line.
- Each interval is worth _____
- The number line is counting up in _____

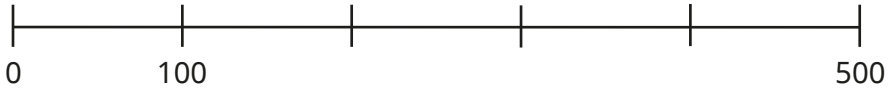
National Curriculum links

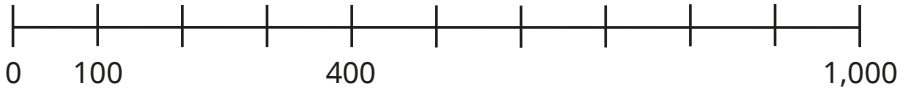
- Count from zero in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- Identify, represent and estimate numbers using different representations

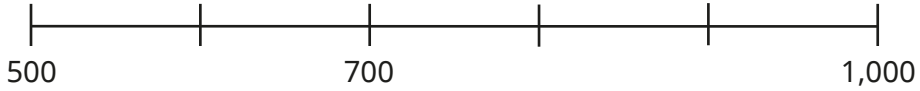
Number line to 1,000

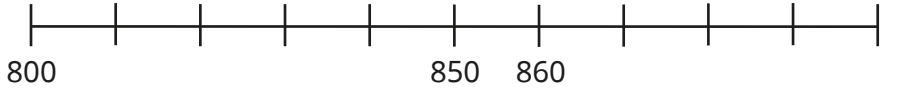
Key learning

- Complete the number lines.

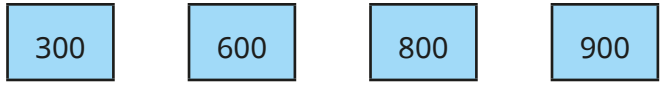


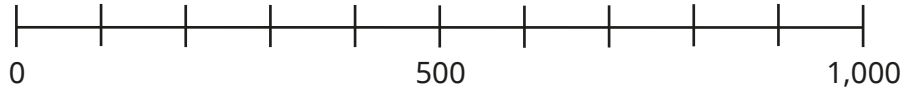




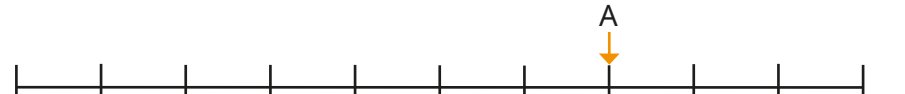


- Draw an arrow to show where each number belongs on the number line.



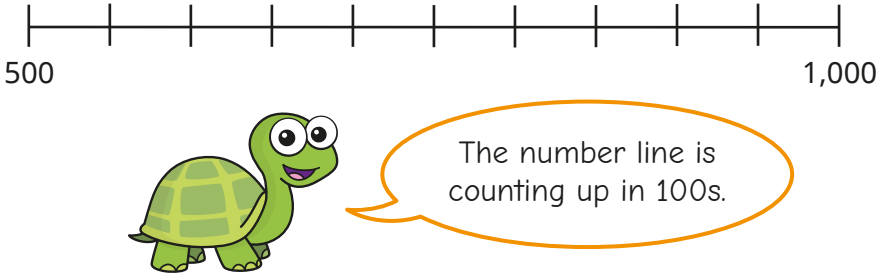


- What numbers are the arrows pointing to?



Number line to 1,000

Reasoning and problem solving

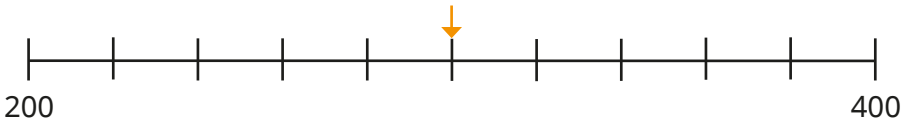


Do you agree with Tiny?

Explain your answer.

No

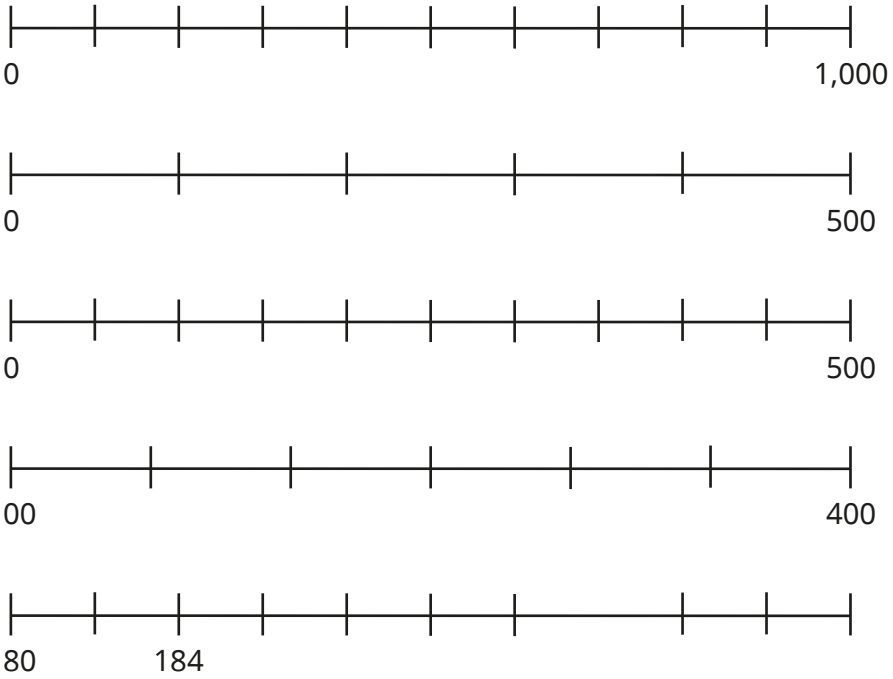
What number is the arrow pointing to?



How did you work this out?

300

Label 200 on each number line.



What do you notice?

arrows drawn in the correct positions

Estimate on a number line to 1,000

Notes and guidance

Building on the previous small step, children estimate the position of numbers on number lines within and up to 1,000

Children use their existing number sense to complete their estimates and can explain their thinking. Initially, they consider key intervals that are factors of 1,000, including but not limited to multiples of 100. Thinking beyond this, they should try to be as accurate as possible, using their knowledge of the midpoint of intervals and which of the two divisions a number is closer to.

Children should understand that their answer might not be exactly the same as their partner's, as they are only able to estimate the positions or values.

Things to look out for

- Children may think that values cannot fall between divisions at all.
- Children may identify the value of the nearest division rather than considering the values that lie between divisions on the number line.
- Children may position any number that lies between two divisions exactly at the midpoint of the interval, rather than considering which division the number is closest to.

Key questions

- What is the number line counting up in? How do you know?
- Where would _____ be on the number line? How do you know?
- Is _____ closer to _____ or _____? How do you know?
- Why can you only estimate?
- What number is halfway between _____ and _____?
- How accurate do you think your estimate is? How could you be more accurate?

Possible sentence stems

- _____ is closer to _____ than _____, so the position of _____ on the number line is closer to _____ than _____
- _____ is more/less than halfway along the interval, so the position of _____ is closer to _____

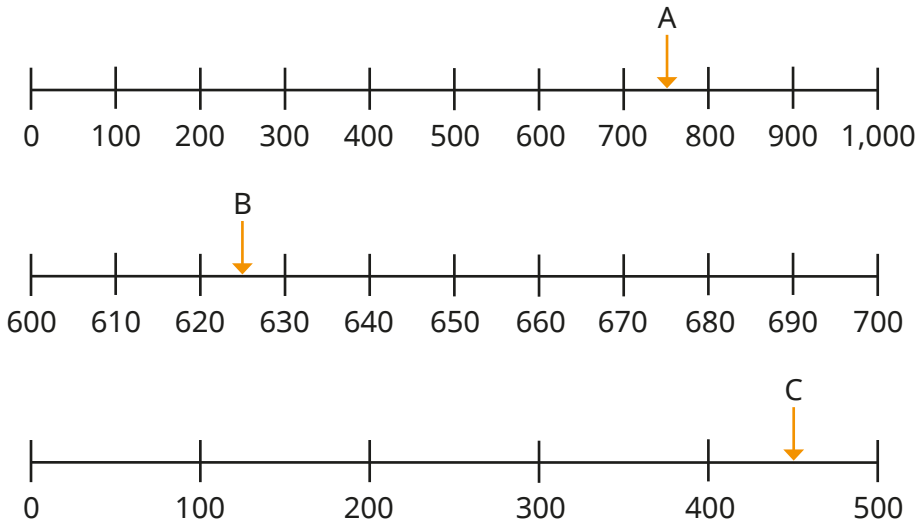
National Curriculum links

- Count from zero in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- Identify, represent and estimate numbers using different representations

Estimate on a number line to 1,000

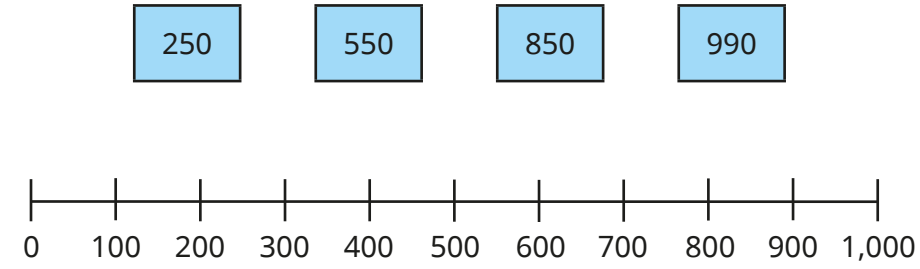
Key learning

- Estimate the numbers that the arrows are pointing to.

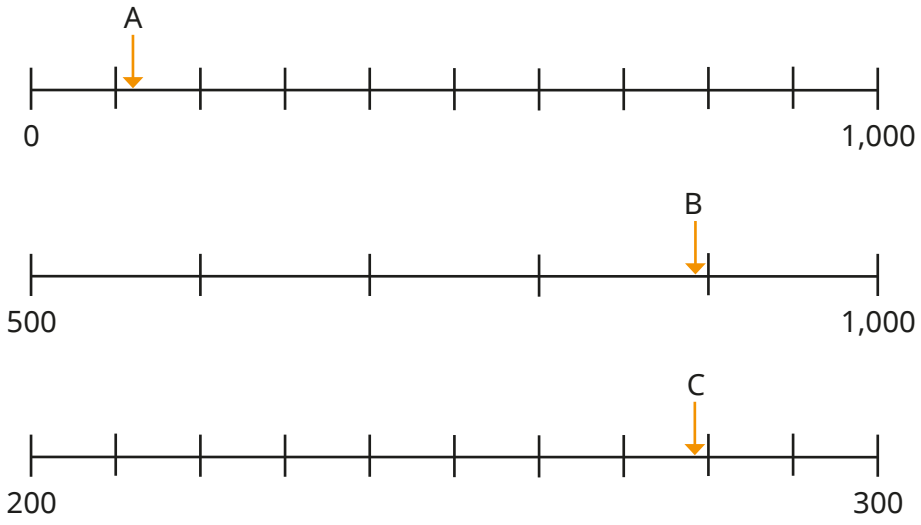


Why are your answers only estimates?

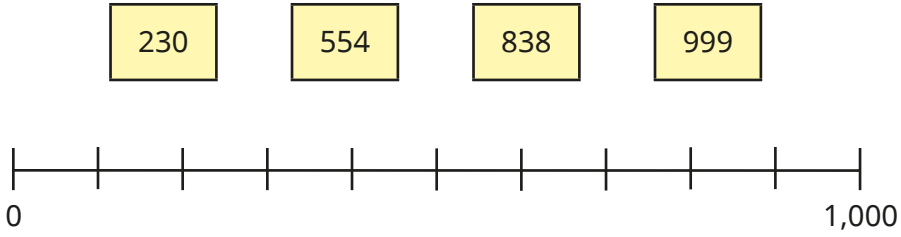
- Estimate where the numbers belong on the number line.



- Estimate the numbers that the arrows are pointing to.



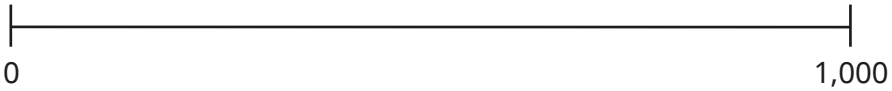
- Estimate where the numbers belong on the number line.



Estimate on a number line to 1,000

Reasoning and problem solving

Here is a number line from 0 to 1,000

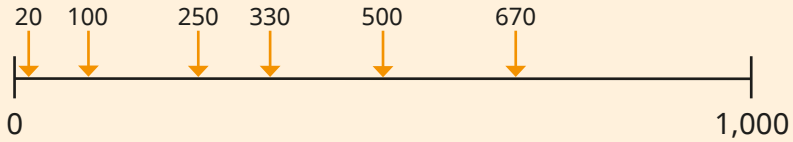


Estimate where the numbers belong on the number line.

100	250	330	500	20	670

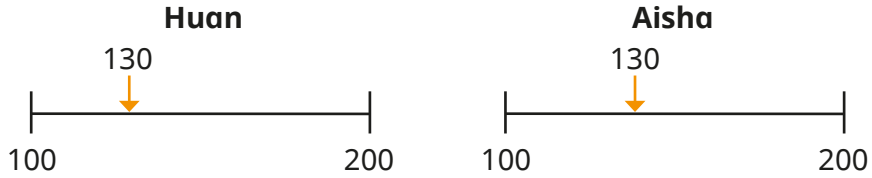
Compare answers with a partner.

Which number was the easiest to estimate?



500 is the easiest to estimate because it is the midpoint.

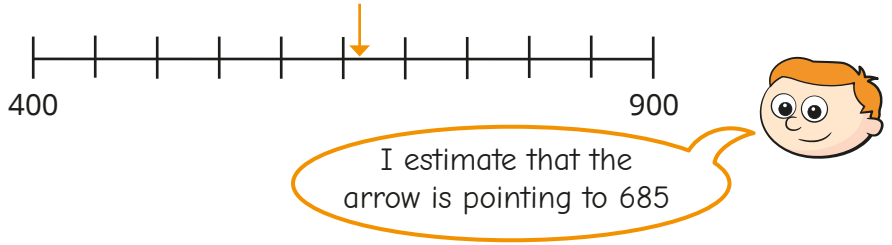
Huan and Aisha have estimated where 130 belongs on the same number line.



Can Huan and Aisha both be correct?

Talk about it with a partner.

Yes



Explain why Ron cannot be correct.

685 is past the midpoint of the interval.

Compare numbers to 1,000

Notes and guidance

In this small step, children compare numbers using concrete resources, pictorial representations, words and symbols.

When given two numbers represented by objects, children use comparative language and symbols to determine which is greater/smaller. Encourage children to use prior learning to help them choose an efficient method to compare. For example, children may choose to place the numbers on a number line, make them using concrete resources or draw them in a place value chart.

By the end of this step, children can explain why they always start with the highest place value when comparing numbers.

Things to look out for

- When comparing numbers using concrete resources, children may think that the more pieces of equipment they have, the greater the number. For example, they may think that 1 hundred and 9 ones is greater than 2 hundreds because they have 10 individual objects compared to 2
- The greater than (>) and less than (<) symbols may need recapping with smaller numbers before comparing numbers up to 1,000

Key questions

- How do you know which number is greater?
- Do you start comparing hundreds, tens or ones first? Why?
- What strategy did you use to compare the two numbers? Is this the same as or different from your partner's?
- Are the base 10 and place value counters showing the same number? How do you know?

Possible sentence stems

- _____ is greater than _____ because ...
- _____ is less than _____ because ...
- When comparing numbers, I start with the _____ place value column.
  If they are the same, I will look at the _____ place value column.

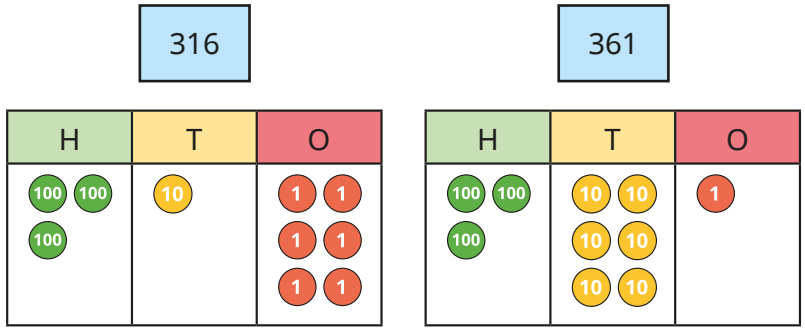
National Curriculum links

- Compare and order numbers up to 1,000

Compare numbers to 1,000

Key learning

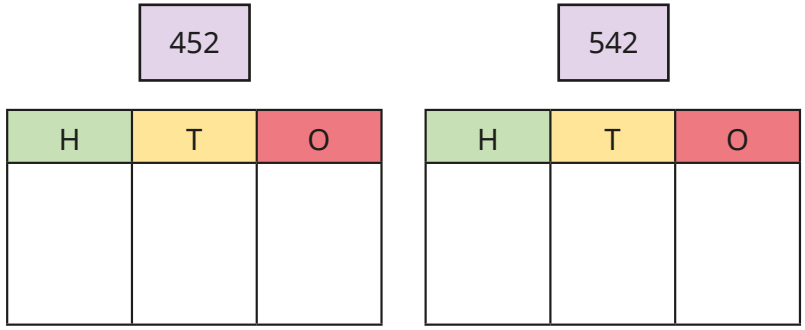
- Which number is greater?



_____ is greater than _____

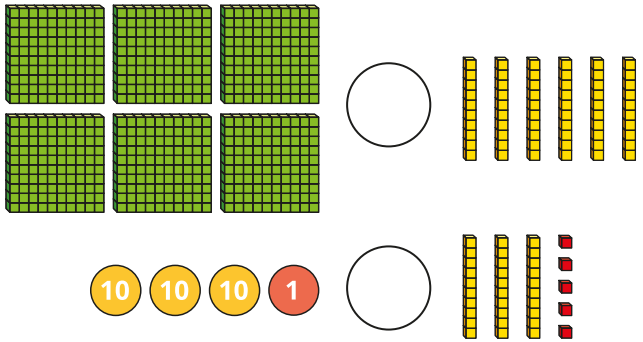
Explain how you know.

- Use place value counters to make and compare the numbers.



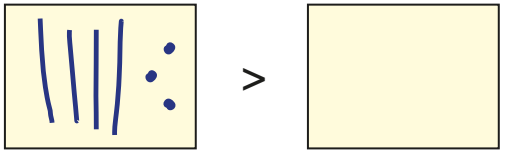
452 is _____ than 542

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



- Nijah has used lines and dots to show a number.

Draw lines and dots to make the statement correct.



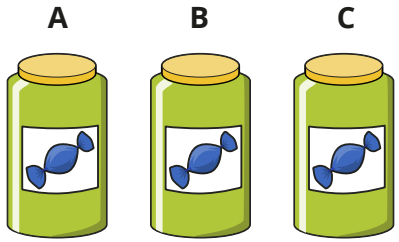
- Which is the greater number in each pair?

nine hundred and two	920
500 and 68	563
7 hundreds and 6 ones	76 tens

Compare numbers to 1,000

Reasoning and problem solving

Mo has three jars of sweets.



Jar A has 235 sweets.

Jar C has 175 sweets.

Jar A has the most sweets.

Jar C has the fewest sweets.

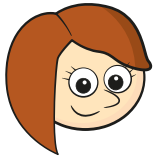
How many sweets could be in jar B?

Explain how you know.

any number of sweets between 176 and 234

Rosie is thinking of a number.

It is between 300 and 500



The difference between the greatest digit and the smallest digit is 2

The digits sum to 14

What could Rosie's number be?

Is there more than one answer?

Explain each step of your thinking.

446 or 464

Order numbers to 1,000

Notes and guidance

In this small step, children order a set of numbers up to 1,000

Children order numbers from smallest to greatest, and from greatest to smallest. For consistency, use the word "greatest" rather than "biggest" or "largest" when describing numbers. Children are also introduced to the language "ascending" and "descending".

A secure understanding of place value is vital for this step, as children need to understand that a digit in the hundreds column, for example, is worth more than a digit in the tens column. Children can continue to use concrete resources, such as base 10, to justify their decisions.

Things to look out for

- Children tend to order numbers from smallest to greatest, so ensure attention is drawn to those questions where they need to order from greatest to smallest.
- Children may just look at the digits and not consider their place values.
- When comparing numbers with different numbers of digits, children may focus only on the first digit of each number and not consider the place value of this digit.

Key questions

- Can you show each number using base 10?
- What is the same about each number? What is different?
- Which number is the greatest? Which number is the smallest? How do you know?
- When comparing two numbers, if the first digits are equal in value, what do you look at next?
- What is different about comparing numbers with the same number of digits and comparing numbers with different numbers of digits?

Possible sentence stems

- _____ hundreds is greater than _____ hundreds, so _____ is the greater number.
- The numbers are ordered from smallest to greatest.
  They are in _____ order.
- The numbers are ordered from greatest to smallest.
  They are in_____ order.

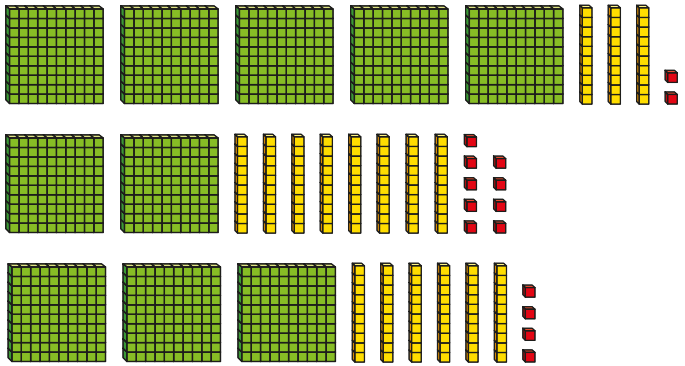
National Curriculum links

- Compare and order numbers up to 1,000

Order numbers to 1,000

Key learning

- What numbers are shown?



Write the numbers in order. Start with the smallest number.

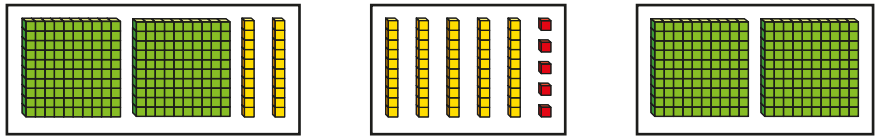
- Write the numbers in order. Start with the greatest number.

H	T	O
4	4	2

H	T	O
3	9	7

H	T	O
4	1	8

- Here are three numbers in base 10



Write the numbers in order. Start with the smallest number.

- Make each number using base 10

59	401	143

Write the numbers in order. Start with the smallest number.

Write the numbers in order again. Start with the greatest number.

- Use the word "ascending" or "descending" to complete the sentences.
  - When a plane is coming in to land, it is _____
  - Scott is walking up a mountain. He is _____ the mountain.
  - When a set of numbers is ordered from smallest to greatest, they are in _____ order.
  - When a set of numbers is ordered from greatest to smallest, they are in _____ order.

- Here are the heights of five children.

122 cm	120 cm	119 cm	124 cm	121 cm

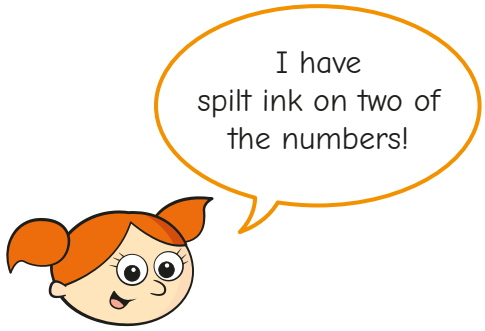
Write the heights in ascending order.

Write the heights in descending order.

Order numbers to 1,000

Reasoning and problem solving

Alex has written six numbers in ascending order.



214, [redacted] 243, 256, [redacted] 289

What could the hidden numbers be?

Explain how you know.

first number: between 215 and 242

second number: between 257 and 288

Is the statement true or false?

> When ordering numbers, you only need to look at the place value column with the highest value.

Explain your answer.

False

The numbers are in descending order.

32__	3__2	2__3	__32	__23

The same digit is missing in each number.

What could the missing digit be?

0 or 1

Count in 50s

Notes and guidance

In this small step, children count in 50s for the first time.

Children use their knowledge of the 5 times-table to support their understanding when counting in 50s and recognise that when counting in 50s, each number they say is 10 times the size of the corresponding number when counting in 5s.

Children start by counting up in 50s from zero, and by the end of the step they can count both forwards and backwards, starting at any multiple of 50 without going beyond 1,000

Number lines and number tracks are used to support counting, and this is also a good opportunity to revisit contexts such as money and measures.

Things to look out for

- Children may struggle when crossing the hundred boundaries. For example, they might say 50, 100, 200 or 50, 100, 105
- Children may struggle when counting beyond 950, for example they may say 900, 950, 100
- When counting backwards, children may start counting forwards again once they reach a multiple of 100, for example 250, 200, 250

Key questions

- What is the same about counting in 5s and counting in 50s?
- What is different about counting in 5s and counting in 50s?
- What is the connection between the 5 times-table and the 50 times-table?
- What patterns do you notice?
- When counting in 50s from zero, will you ever say a number with _____ tens? How do you know?

Possible sentence stems

- When counting in 50s, the number before/after_____ is _____
- 50 more/less than _____ is _____
- If 5 lots of _____ is _____, then 50 lots of_____ is _____

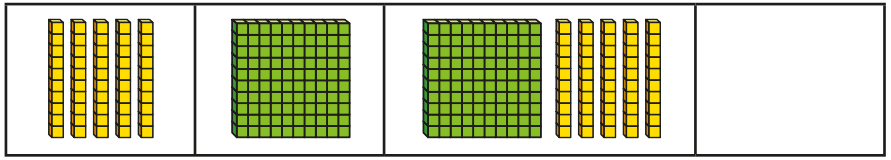
National Curriculum links

- Count from zero in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number

Count in 50s

Key learning

- What numbers are shown on the number track?



Draw base 10 to complete the number track.

- Esther has made a number track for counting in 5s.

5	10	15	20	25	30

Ben has made a number track for counting in 50s.

50	100	150	200	250	300

What is the same about their number tracks? What is different?

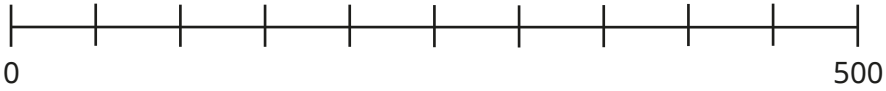
What patterns do you notice?

- Complete the number tracks.

50		150	200			350		450	

	750	700	650			500			350

- Complete the number line.



- Tom has written two number patterns.

50, 100, 105, 200, 250, 300 ...

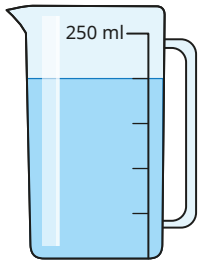
990, 950, 900, 850, 800 ...

Find and explain the mistake that Tom has made in each pattern.

- Here are some packs of cards.

How many cards are there altogether?

- How many millilitres of water are there in the jug?



Count in 50s

Reasoning and problem solving

Jack has some 50p coins.

How many 50p coins does Jack have?

7 coins

Whitney has some 50p coins.

Explain why Whitney must be incorrect.

When counting in 50s from zero, we do not say 230, so Whitney cannot be correct.

Is each statement always true, sometimes true or never true?

When counting in 50s starting from zero, the numbers are all even.	always
There are only two digits in a multiple of 50	sometimes
Only the hundreds and tens columns change when counting in 50s.	sometimes

Talk about your answers with a partner.

If 8 × 5 = 40, what is 8 × 50?

Compare answers with a partner.

How did you work this out?

400