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.

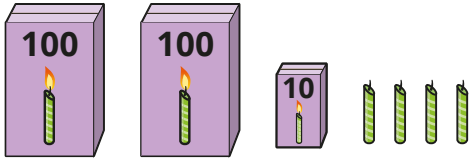
National Curriculum links

- 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

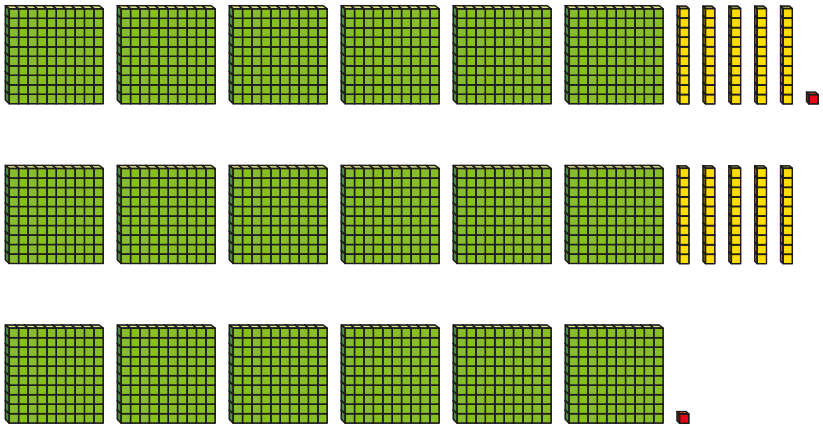
Key learning

- How many candles are there?



Write your answer in numerals and words.

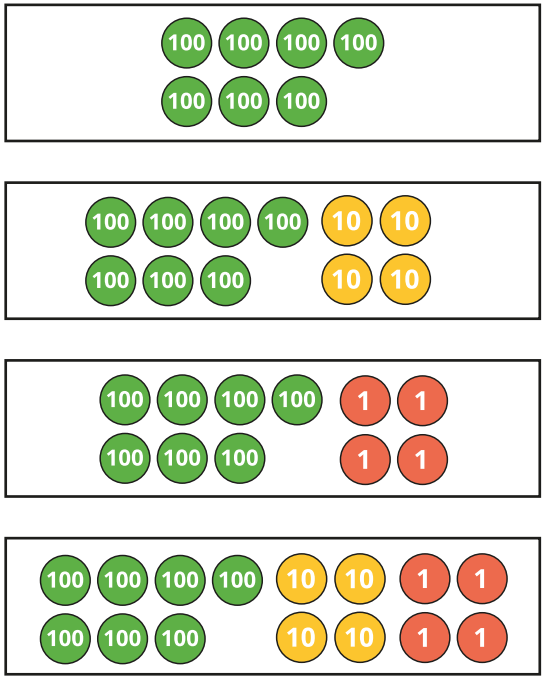
- What numbers are represented?



- Use base 10 to represent each number.

362	326	306	360	300	230

- What numbers are represented?



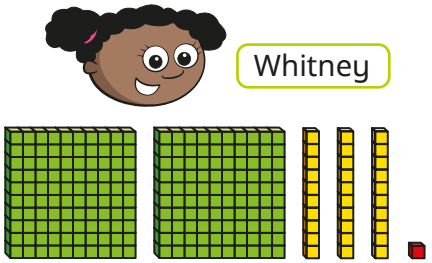
- Annie is drawing place value counters to represent 516

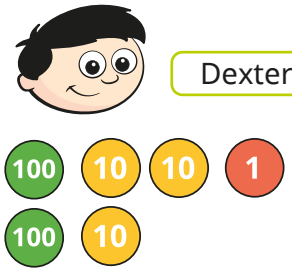
Complete her drawing.

Represent numbers to 1,000

Reasoning and problem solving

Whitney and Dexter have each made a number.

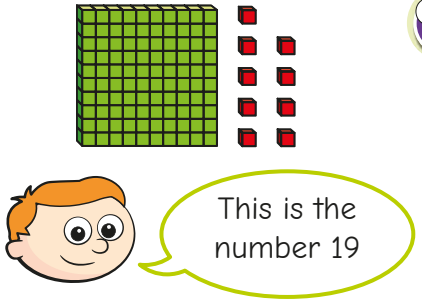




What numbers have they made?

What is the same about their numbers?
What is different?

Whitney and Dexter have both made the number 231

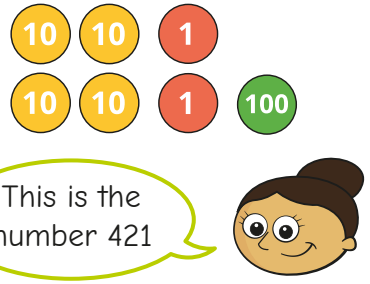


What mistake has Ron made?

What is the number?

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

109



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 _____

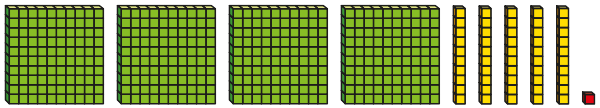
National Curriculum links

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

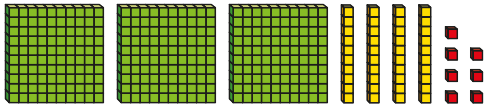
Partition numbers to 1,000

Key learning

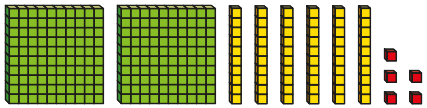
- Use the base 10 to help you complete the number sentences.



451 = 400 + _____ + _____



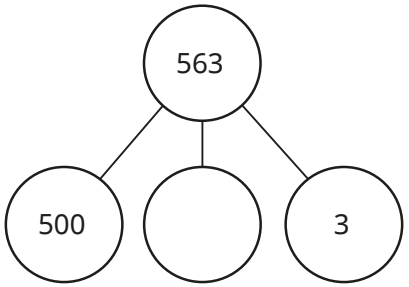
347 = _____ + _____ + _____

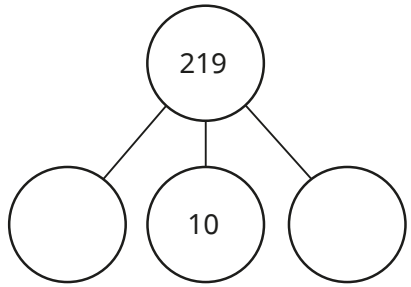


265 = _____ + _____ + _____

- Complete the number sentences.
  - 982 = _____ + _____ + _____
  - 980 = _____ + _____
  - 902 = _____ + _____

- 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?

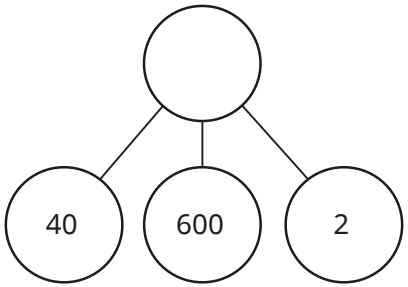
  How many ones does the number 36 have?

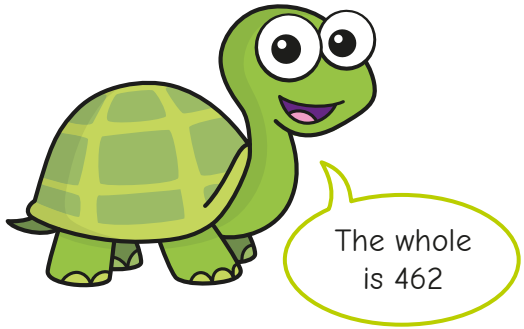
  How many tens does the number 680 have?

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

Partition numbers to 1,000

Reasoning and problem solving





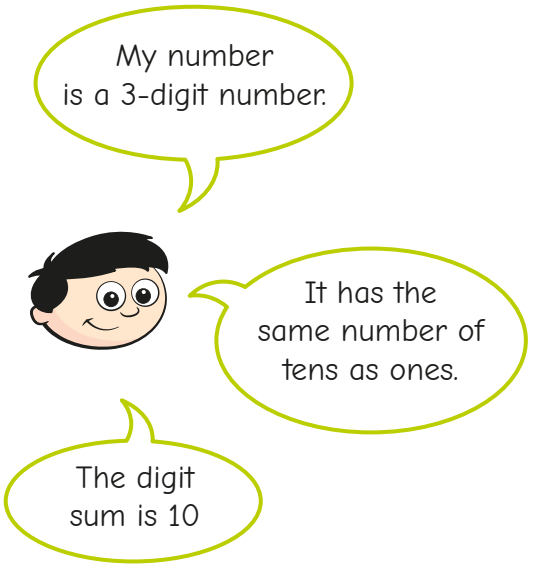
Explain the mistake that Tiny has made.

What is the whole?

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

642

Dexter is thinking of a number.



What could Dexter's number be?

Find each possibility and partition it.

244 = 200 + 40 + 4

433 = 400 + 30 + 3

622 = 600 + 20 + 2

811 = 800 + 10 + 1

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 _____

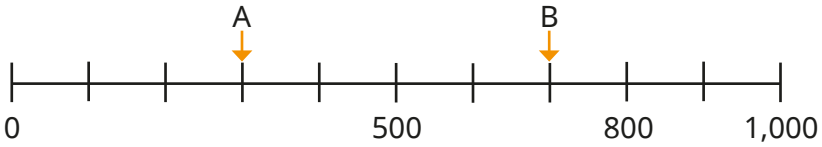
National Curriculum links

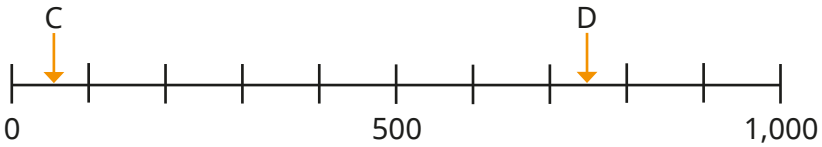
- Identify, represent and estimate numbers using different representations

Number line to 1,000

Key learning

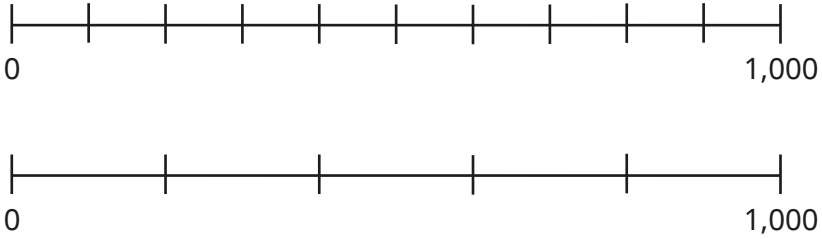
- What numbers are the arrows pointing to?





- Complete the sentences for each number line.

  Label the number lines.

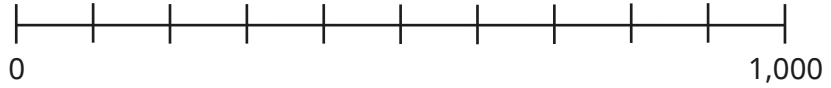


  The difference in value between the start and the end of the number line is _____

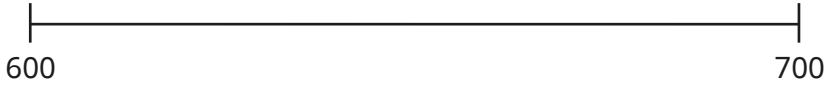
  There are _____ intervals.

  _____ ÷ _____ = _____

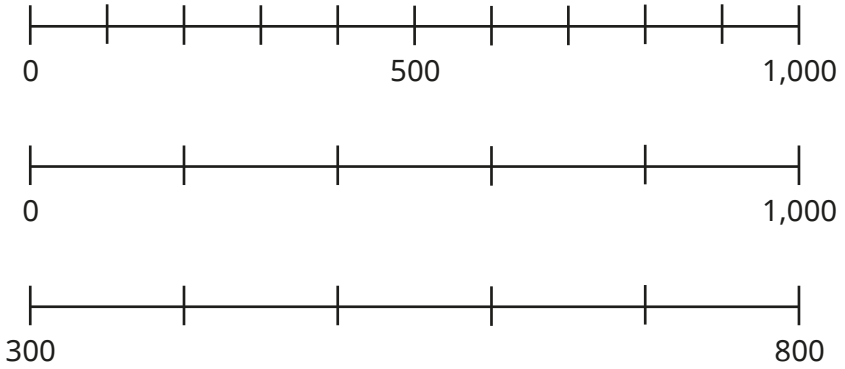
- Label 200 and 750 on the number line.



- Label 680 on the number line.



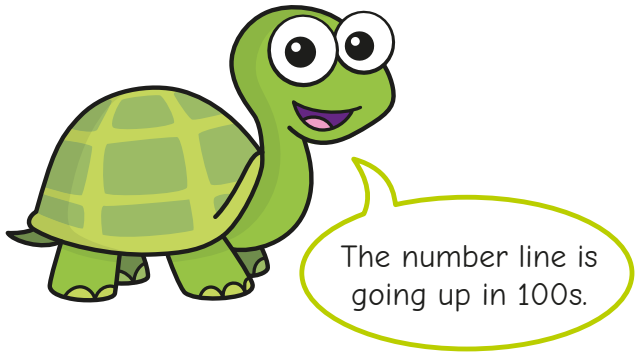
- Draw an arrow to show the position of 550 on each number line.



  What do you notice?

Number line to 1,000

Reasoning and problem solving

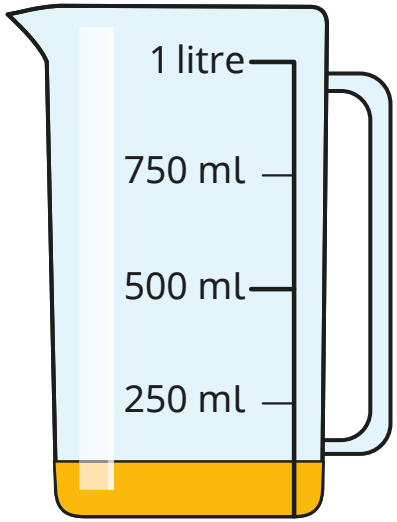


Do you agree with Tiny?

Talk about your answer with a partner.

No

Filip has poured some juice from a jug.



Estimate how much juice is left in the jug.

approximately 125 ml

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

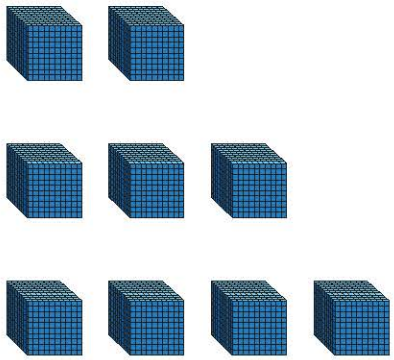
Thousands

Key learning

- How many nails are there?

Write your answer in numerals and words.

- What numbers are represented?

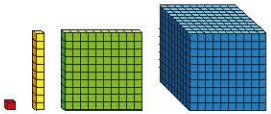


- Complete the number tracks.

1,000	2,000			

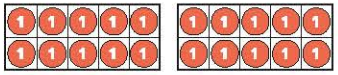
		7,000	8,000	9,000

- 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

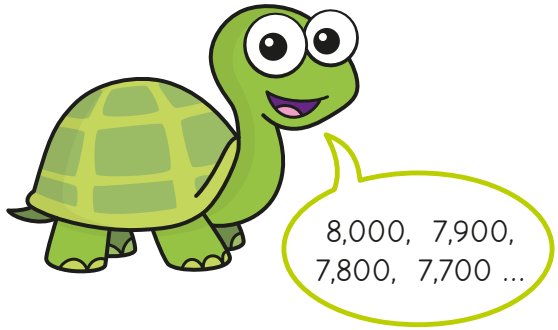
    There are _____ hundreds in 3 thousand.
  - _____ thousand = 5,000

    There are 50 hundreds in _____ thousand.

Thousands

Reasoning and problem solving

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



What mistake has Tiny made?

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

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

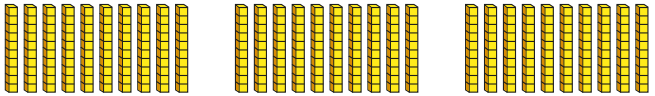
Is the statement true or false?

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

False

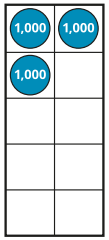
Jack, Huan and Dani are asked to represent 3,000

Jack



Huan

Dani



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 _____

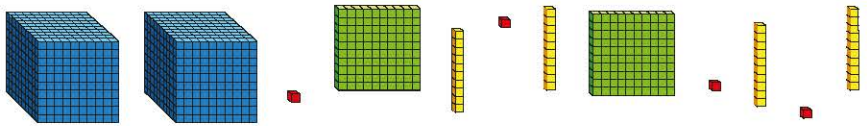
National Curriculum links

- 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.



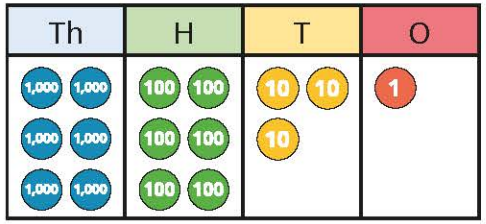
There are _____ thousands, _____ hundreds, _____ tens and _____ ones.

The number is _____

- Use base 10 to represent each number.

1,222	1,871	3,468	2,107

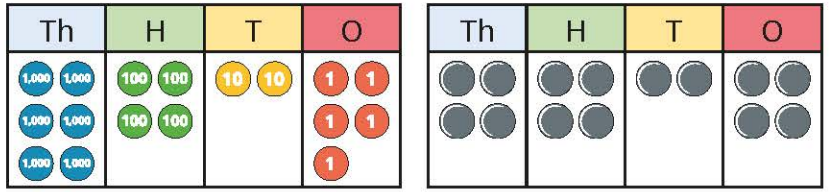
- Complete the sentences.



There are _____ thousands, _____ hundreds, _____ tens and _____ ones.

The number is _____

- What numbers are represented on the place value charts?



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.

4,012	5,540	6,207	8,001

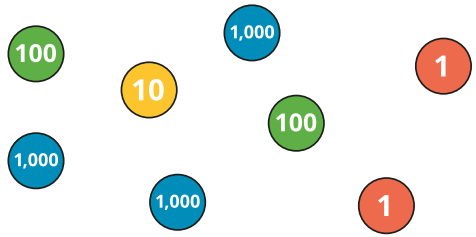
- Complete the Gattegno chart to represent the number 5,326

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.



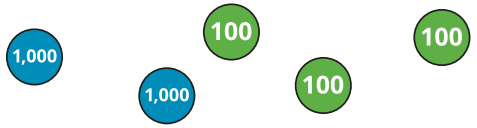
What other place value counters could she add to make 3,512?

multiple possible answers, e.g.
3 hundreds

2 hundreds and 10 tens

300 ones

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

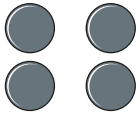


What 4-digit numbers can he make?

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 thousands, 3 hundreds, 4 tens and 6 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.

  _____ = _____ + _____ + _____ + _____

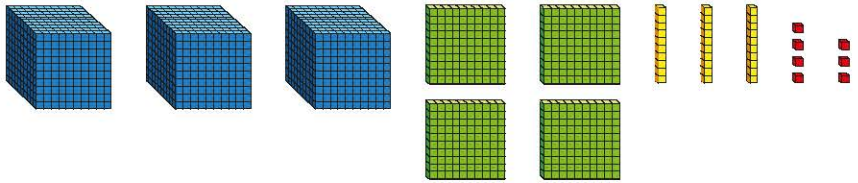
National Curriculum links

- 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 + _____ + _____ + _____

- Complete the number sentences.

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

3,412 = _____ + _____ + _____ + _____

Thousands	Hundreds	Tens	Ones

_____ = _____ + _____ + _____ + _____

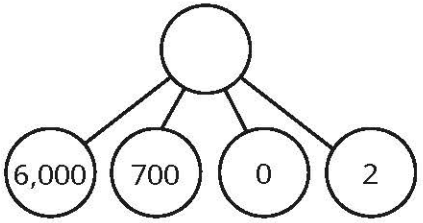
- Use the Gattegno chart to complete the number sentences.

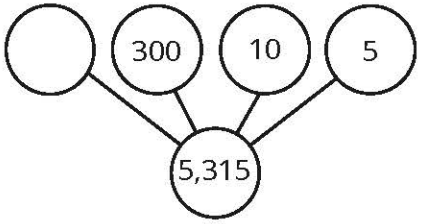
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

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

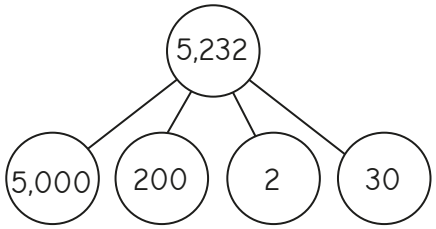
Tiny is partitioning 6,902

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.

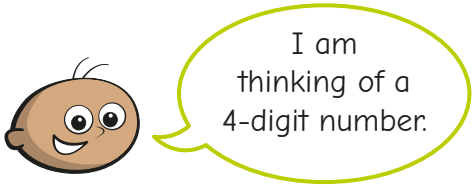


Has Tiny partitioned the number correctly?

Explain your answer.

Yes

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



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 _____ + _____ + _____ + _____

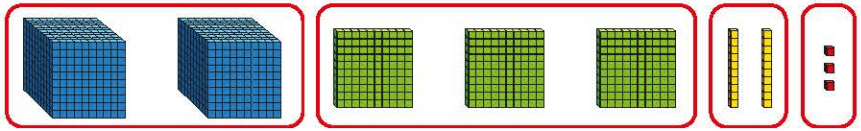
National Curriculum links

- 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

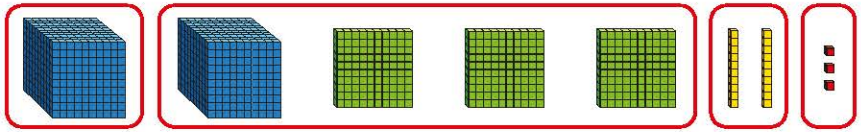
Flexible partitioning of numbers to 10,000

Key learning

- Complete the number sentences.



2,323 = 2,000 + _____ + _____ + _____



2,323 = _____ + _____ + _____ + _____

How else can 2,323 be partitioned?

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

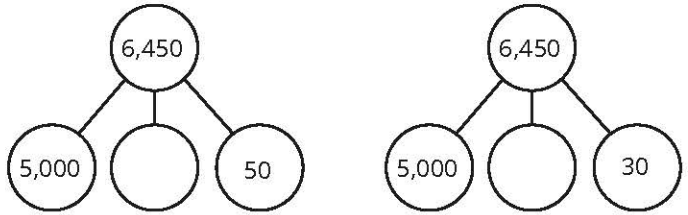
Thousands	Hundreds	Tens	Ones
1,000 1,000	100 100 100	10 10 10	1 1 1 1 1 1 1 1 1

2,339 = 2,000 + _____ + 30 + 9

2,339 = 2,000 + 300 + _____ + 19

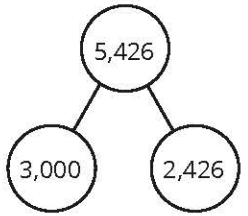
2,339 = 1,000 + _____ + 30 + 9

- 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 + _____ + 31
  - 6,729 = 3,000 + _____ + 19 + _____
  - 9,310 = _____ + 110 + _____

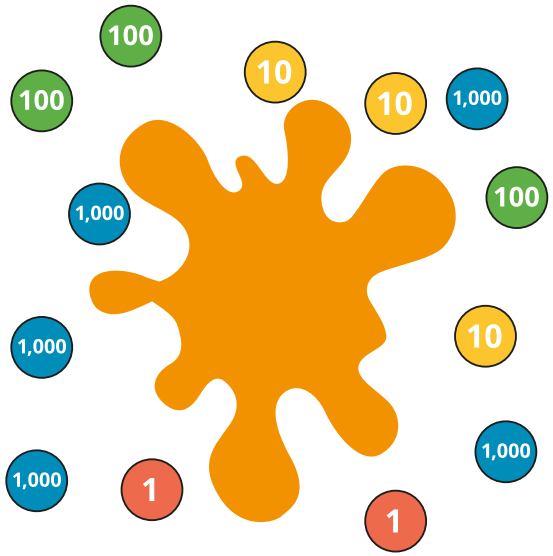
Is there more than one way of completing each sentence?

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

Explain how you know.

35 tens = 350

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.

Who is thinking of the greater number?

How do you know?

Scott

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 _____

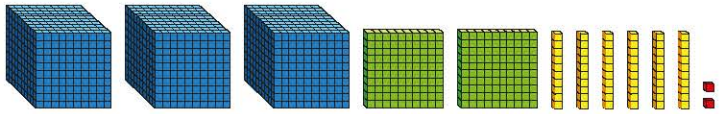
National Curriculum links

- 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 1,000 1,000 1,000	100 100 100	10 10	1 1 1 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 1,000 1,000	100 100 100 100 100 100 100 100 100 100	10 10 10	1 1

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	100 100 100 100	10 10 10 10 10 10 10 10 10 10	1 1

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

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

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

Complete the function machines.

input				output
4,896	→	+ 1,000	→	
3,784	→		→	2,784
	→	– 100	→	986

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 _____

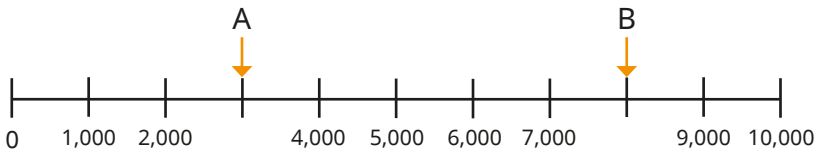
National Curriculum links

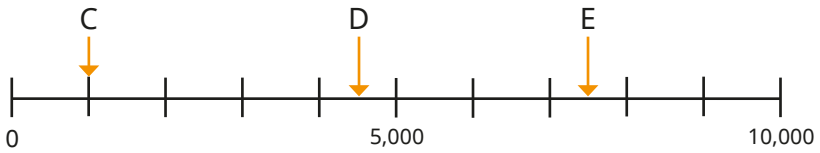
- Identify, represent and estimate numbers using different representations
- Order and compare numbers beyond 1,000

Number line to 10,000

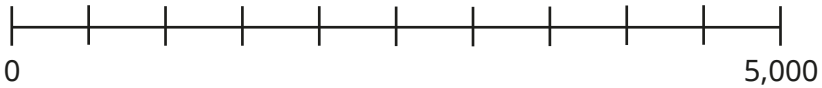
Key learning

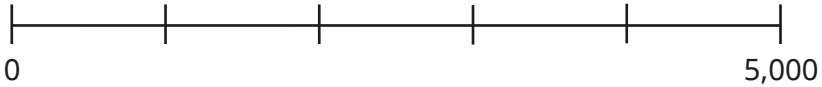
- What numbers are the arrows pointing to?



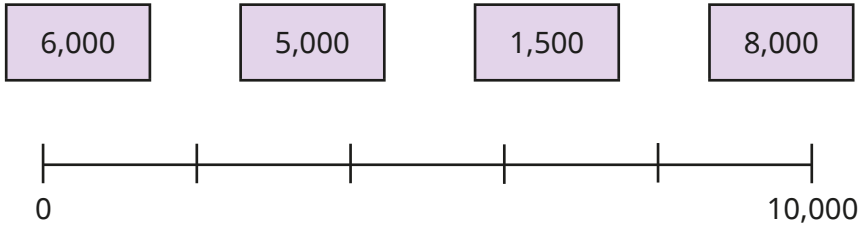


- Label the number lines.

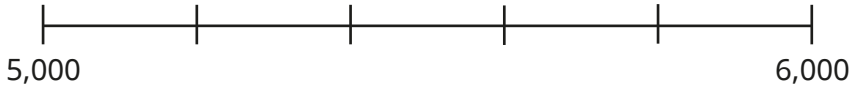




- Mark the positions of the numbers on the number line.

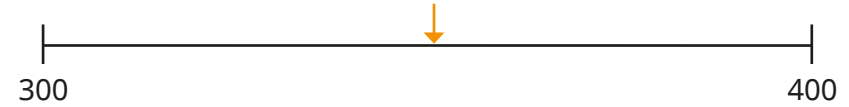


- Label 5,100 and three other numbers on the number line.



Compare answers with a partner.

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

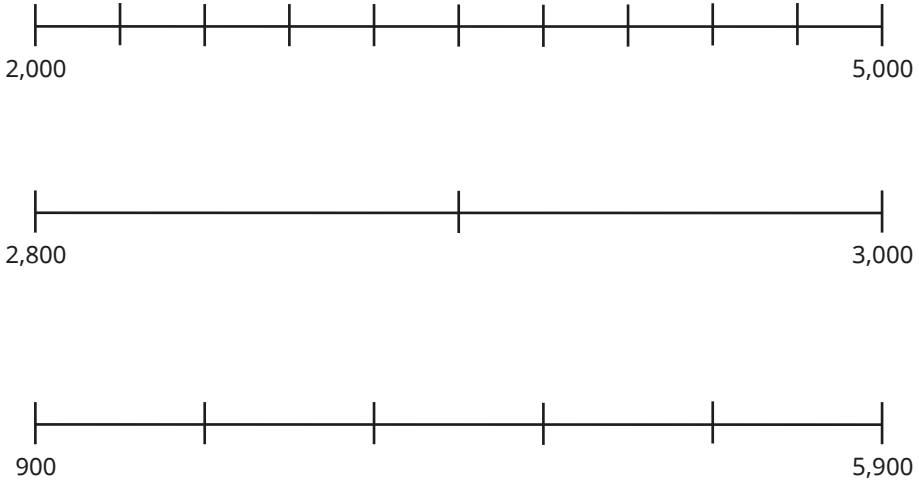


What do you notice?

Number line to 10,000

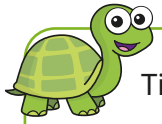
Reasoning and problem solving

Label 2,900 on each number line.

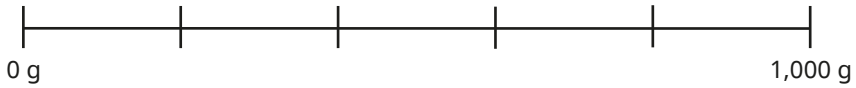


What do you notice?

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



Tiny is working out the missing values on a scale.



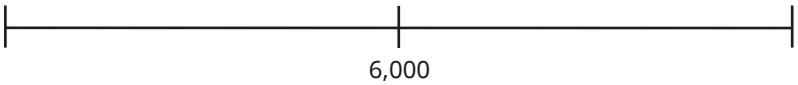
1,000 – 0 = 1,000
1,000 ÷ 6 = ?

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

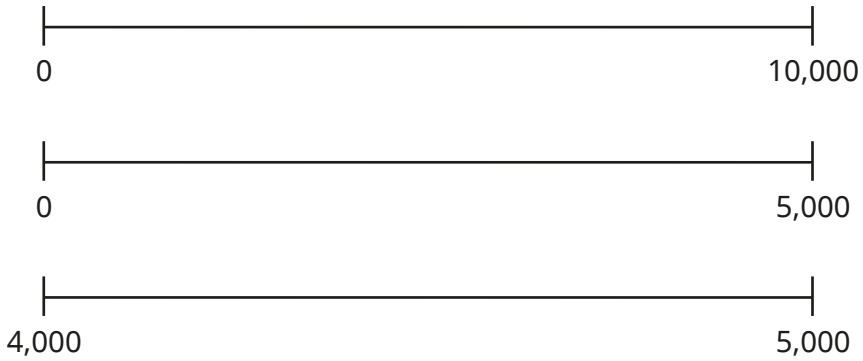
- Identify, represent and estimate numbers using different representations
- Order and compare numbers beyond 1,000

Estimate on a number line to 10,000

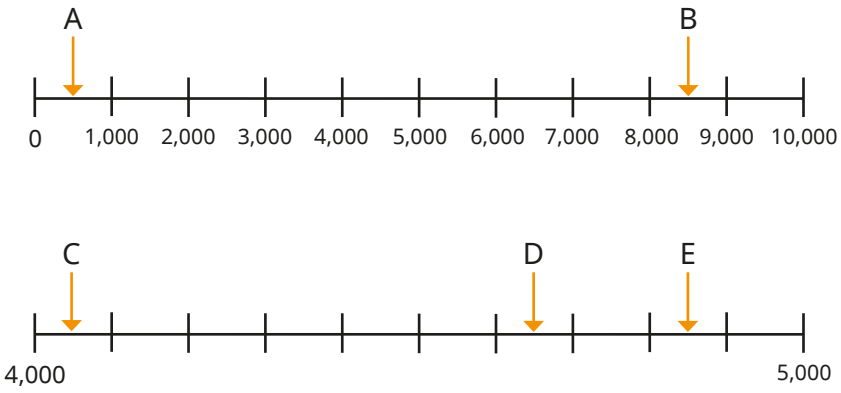
Key learning

- Mark the midpoint of each number line.

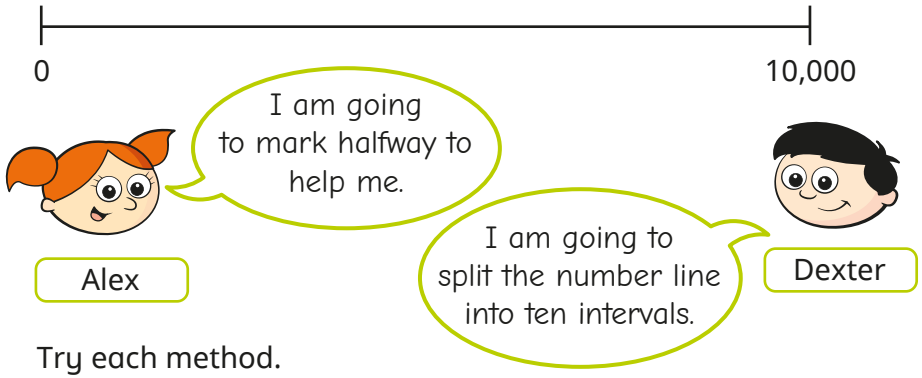
  What number does each midpoint represent?



- Estimate the numbers the arrows are pointing to.



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

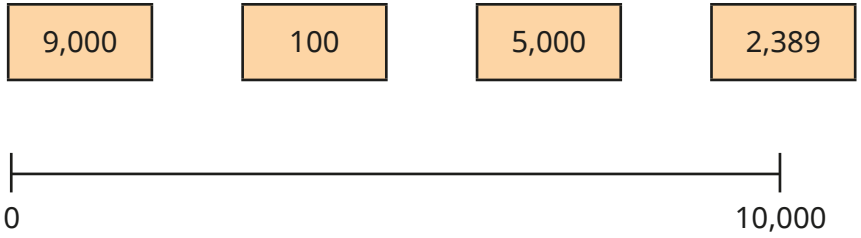


  Try each method.

  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.

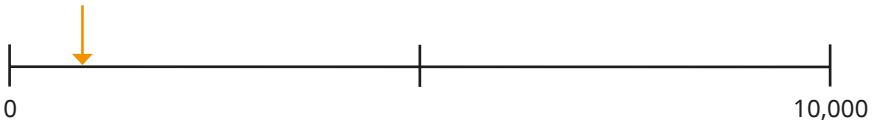


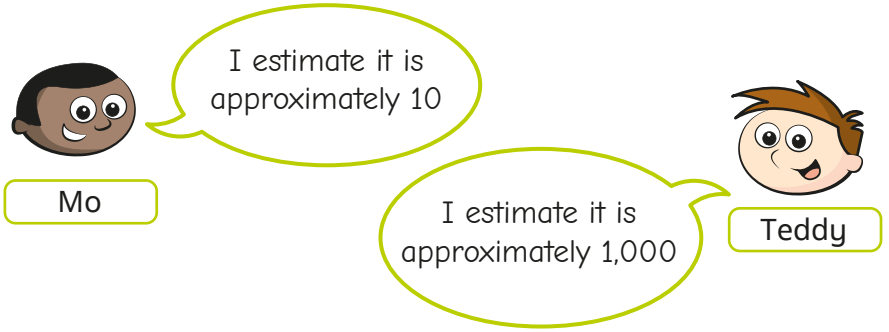
  Compare methods with a partner.

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.



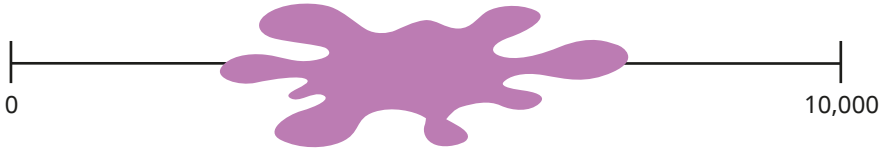


Who do you agree with?

Explain your answer.

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

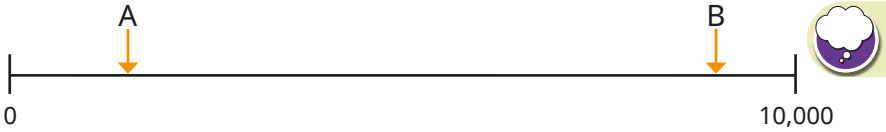
Miss Rose has spilt some paint on the number line.



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 ...

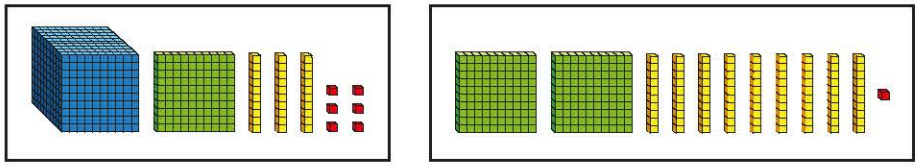
National Curriculum links

- Order and compare numbers beyond 1,000

Compare numbers to 10,000

Key learning

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

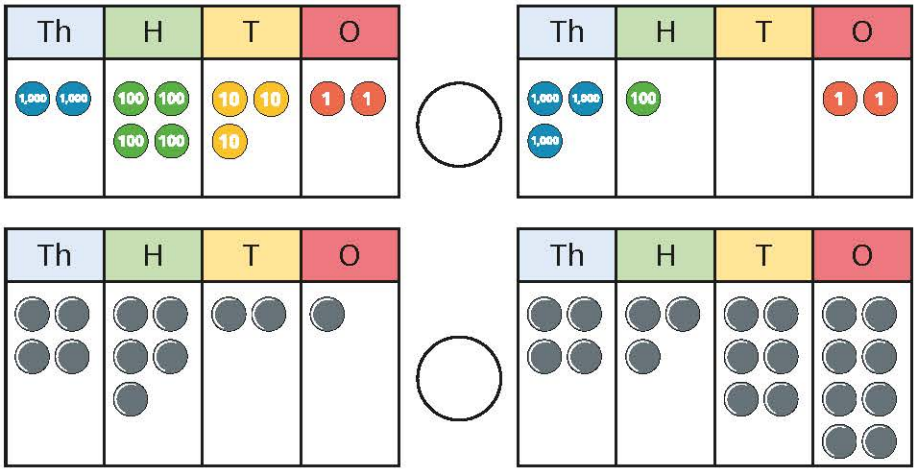


Complete the sentences.

_____ is less than _____

_____ is greater than _____

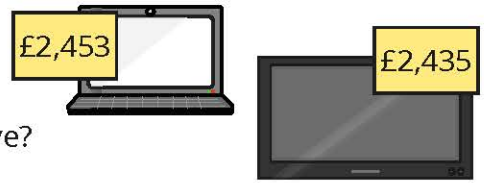
- Write <, > or = to compare the numbers.



- 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

98 ◯ 1,032

3,402 ◯ 1,897

4,283 ◯ 4,238

7,000 m ◯ 4,629 m

£5,612 ◯ £5,628

4,002 ◯ 865

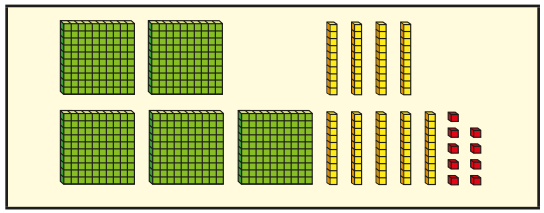
1,902 ◯ 1,920

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:

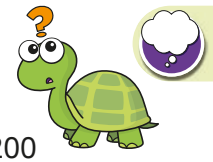
4,359

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.

1	2	3	4	5

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.

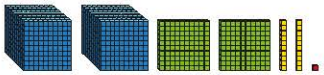
National Curriculum links

- Order and compare numbers beyond 1,000

Order numbers to 10,000

Key learning

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

Nijah 

Dani 

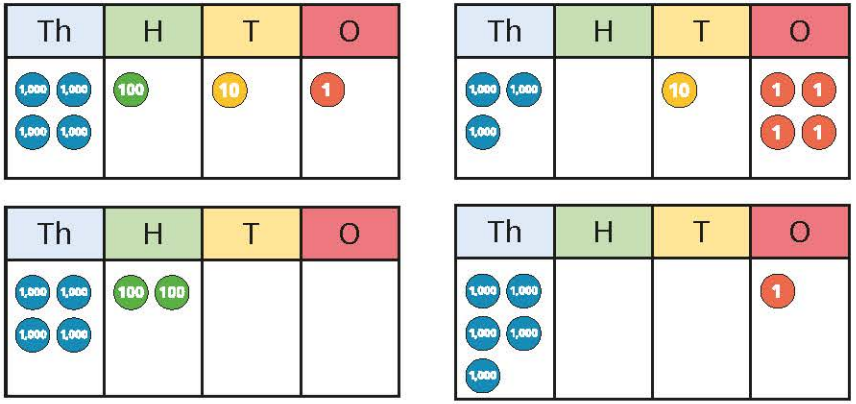
Brett 

Who has made the greatest number?

Who has made the smallest number?

How do you know?

- Tom makes four numbers using place value counters.



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

- Here are four digit cards.

4	0	5	3

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.

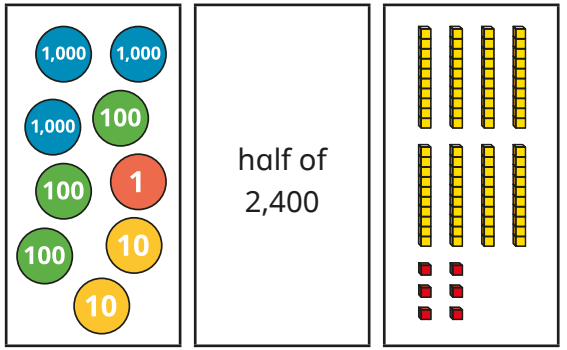
3,6__4	3,__29	3,5__8

The same digit is missing from each number.

What is the missing digit?

6

Put the numbers in ascending order.



86 (base 10)

1,200 (half of 2,400)

3,321 (counters)

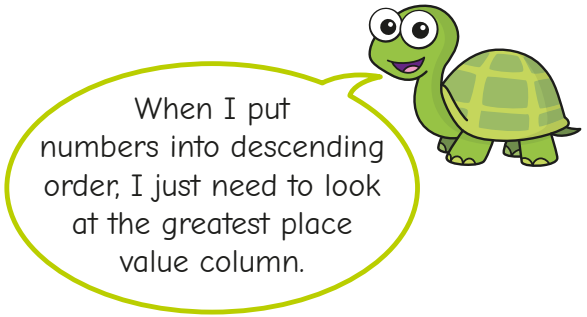
Aisha has written five numbers in ascending order.

1,354	3,273	4,314	889	9,993
smallest				greatest

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.



Is Tiny correct?

Explain your answer.

No

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

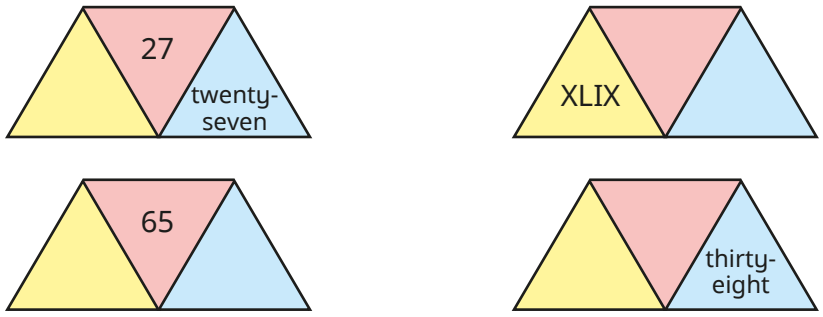
- Four numbers are written in Roman numerals.

XXIV	LIX
LXXXVII	XCVII

What are the numbers?

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

Complete the diagrams.

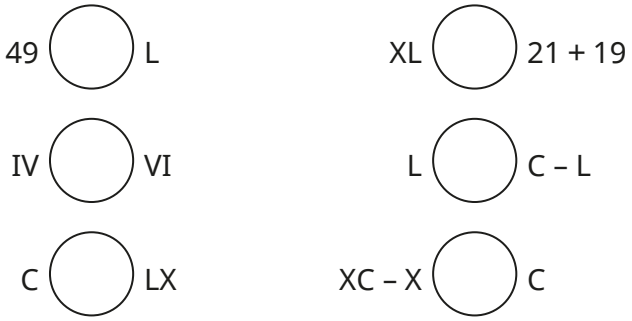


- Choose the correct answer to each calculation.

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

- Complete the function machines.

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



Roman numerals

Reasoning and problem solving

Is the statement true or false?

XX + II = XXII,
so XXII + XXII = XXIIXXII

Explain your answer.

False

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

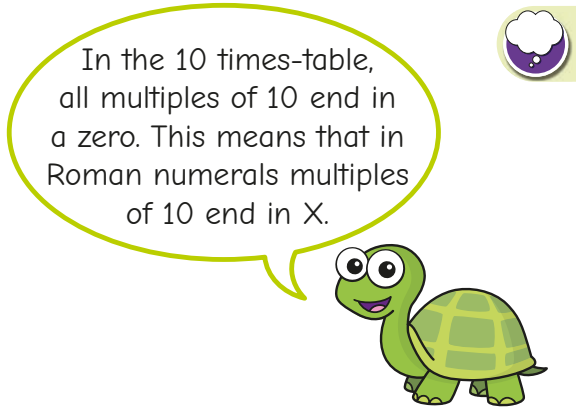
multiple possible answers, e.g.

C ÷ II

L ÷ I

X × V

XXV × II



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

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

I	V	X	C

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 _____

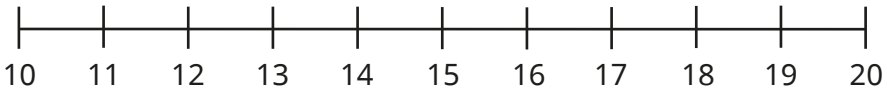
National Curriculum links

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

Round to the nearest 10

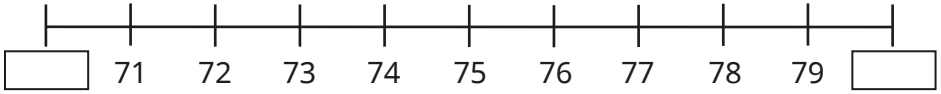
Key learning

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



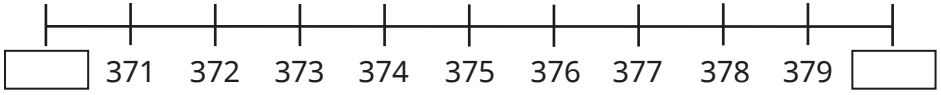
13 is closer to _____ than _____

13 rounded to the nearest 10 is _____



78 is closer to _____ than _____

78 rounded to the nearest 10 is _____

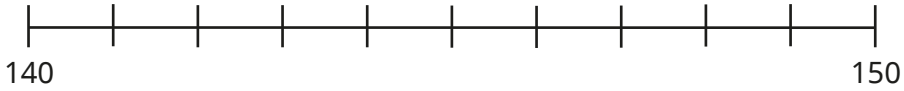


378 is closer to _____ than _____

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 _____

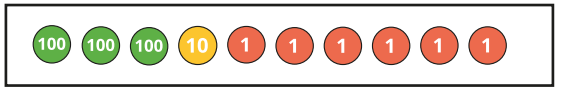
- Round each number to the nearest 10

34	140	345	898	203

- Which numbers round to 760 to the nearest 10?

761 **765** **760** **763** **755**

- Round each number to the nearest 10



LVII

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

Who do you agree with?

Explain your answer.

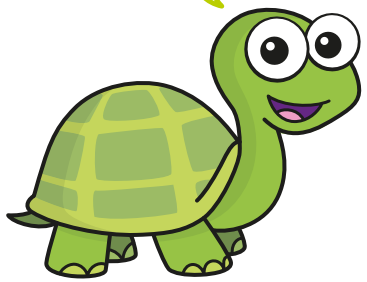
Jack

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 _____

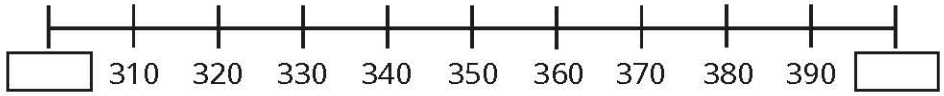
National Curriculum links

- 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?

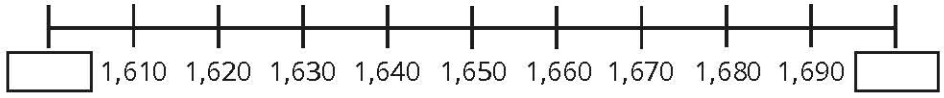


Use the number line to help you complete the sentences.

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 _____

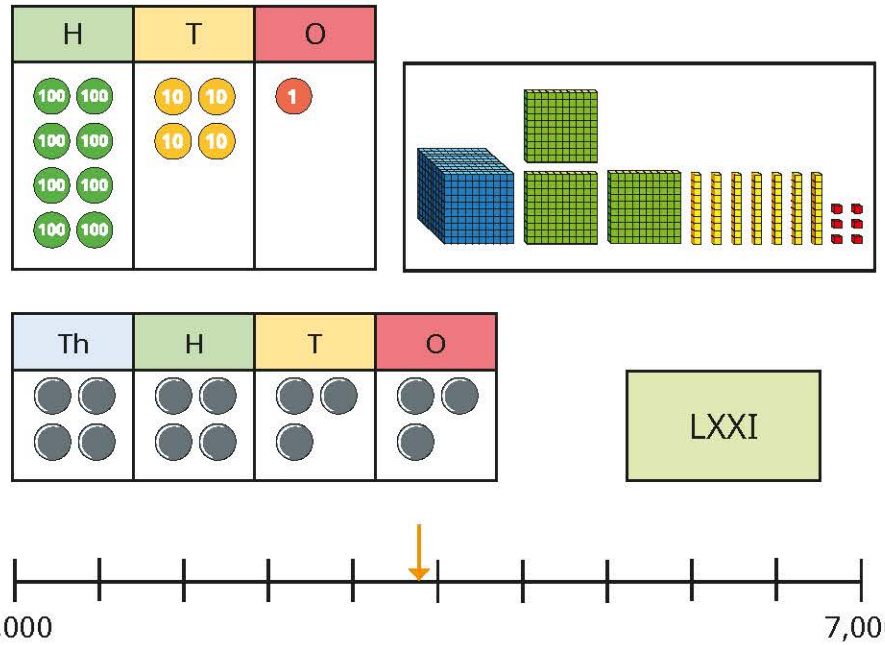
1,681 rounded to the nearest 100 is _____

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



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

649

595

604

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

The sum of the digits in the number is 15

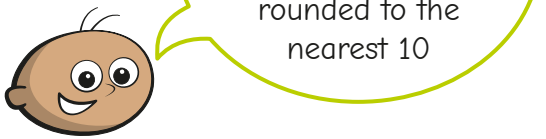
How many people could there be?

4,551, 4,560, 4,605,

4,614, 4,623, 4,632,

4,641

Tommy is thinking of a number.



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 _____

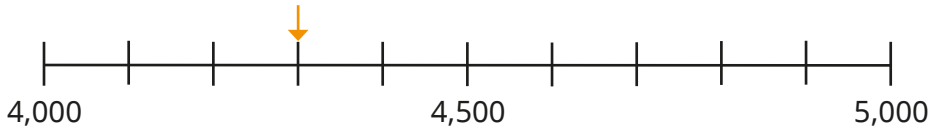
National Curriculum links

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

Round to the nearest 1,000

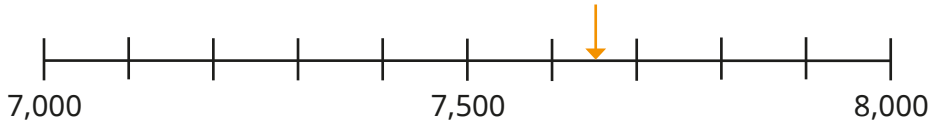
Key learning

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



4,300 is closer to _____ than _____

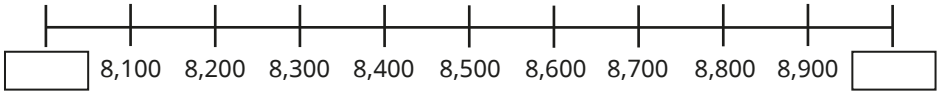
4,300 rounded to the nearest 1,000 is _____



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

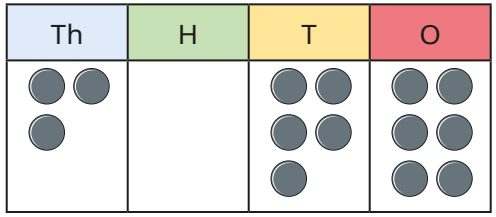
2,290	720	3,450	9,932
5,049	53	6,500	9,502

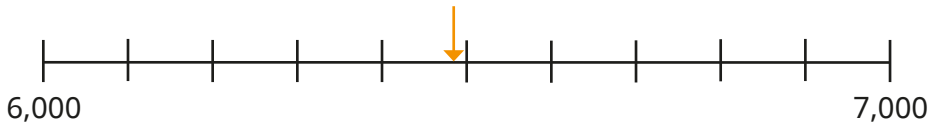
- Which numbers round to 9,000 to the nearest 1,000?

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





four thousand, six hundred and forty-three

Round to the nearest 1,000

Reasoning and problem solving

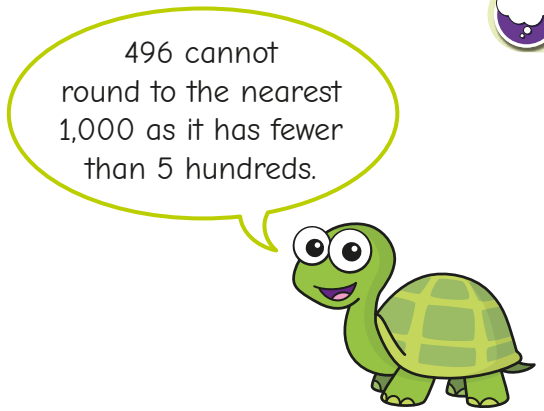
Each of the numbers round to 4,000 to the nearest 1,000

What could the missing digits be?

4, __ 28 __ ,842

4,2 __ 8 __ ,482

0 to 4	3
0 to 9	4

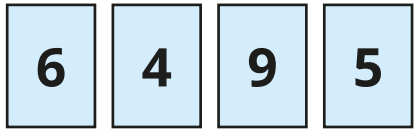


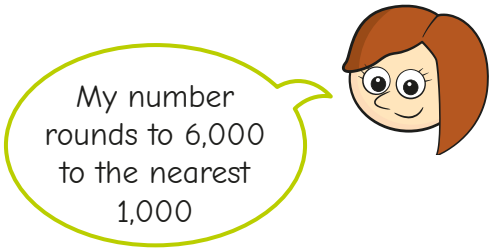
Do you agree with Tiny?

Explain your answer.

No

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





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

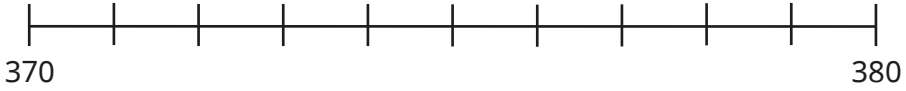
- Round any number to the nearest 10, 100 or 1,000

Round to the nearest 10, 100 or 1,000

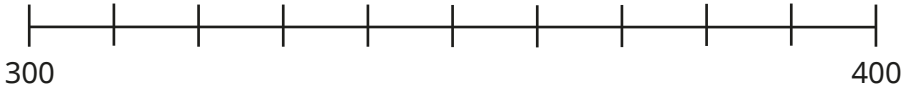
Key learning

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

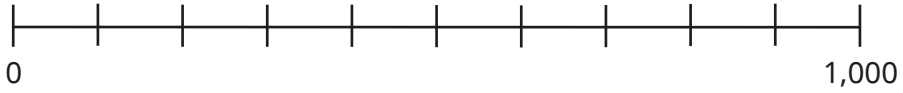
  Complete the sentences.



  376 rounded to the nearest 10 is _____

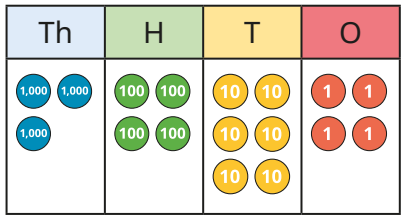


  376 rounded to the nearest 100 is _____



  376 rounded to the nearest 1,000 is _____

- Here is a number.



  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?

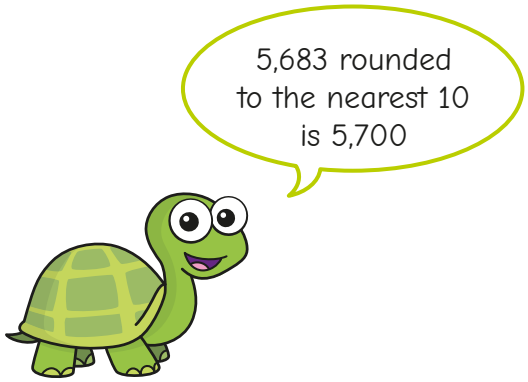
- A school fete raises £2,166

  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



What mistake has Tiny made?

What is the correct answer?

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

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

What could Whitney's number be?

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

between 5,995 and 6,004

5,997