

Block 1 – Place Value

Year 4/5

#MathsEveryoneCan

2019-20



## How to use the mixed-age SOL

In this document, you will find suggestions of how you may structure a progression in learning for a mixed-age class.

Firstly, we have created a yearly overview.

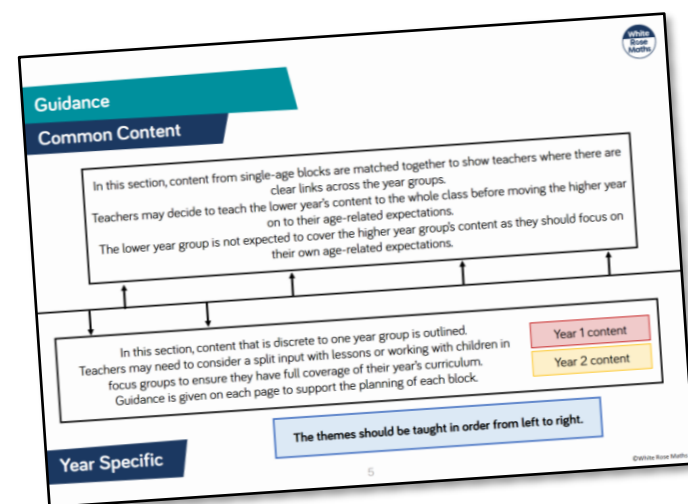
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value Y1 – Numbers to 20 Y2 – Numbers to 100			Number: Addition and Subtraction Year 1- Numbers within 20 (including recognising money) Year 2- Numbers within 100 (including money)						Number: Year 1: Place Value to 50 and Multiplication Year 2: Multiplication		
Spring	Number: Year 1: Division & consolidation Year 2: Division		Year 1: Place Value to 100		Measurement: Length and Height		Geometry: Year 1: Shape and Consolidation Year 2: Properties of Shape		Number: Year 1: Fractions and Consolidation Year 2: Fractions		Consolidation	
Summer	Geometry: Position and Direction	Measurement: Time		Problem solving and efficient methods		Measurement: Year 1: Weight and Volume Year 2: Mass, Capacity and Temperature		Consolidation and Investigations				

Each term has 12 weeks of learning. We are aware that some terms are longer and shorter than others, so teachers may adapt the overview to fit their term dates.

The overview shows how the content has been matched up over the year to support teachers in teaching similar concepts to both year groups. Where this is not possible, it is clearly indicated on the overview with 2 separate blocks.

For each block of learning, we have grouped the small steps into themes that have similar content. Within these themes, we list the corresponding small steps from one or both year groups. Teachers can then use the single-age schemes to access the guidance on each small step listed within each theme.

The themes are organised into common content (above the line) and year specific content (below the line). Moving from left to right, the arrows on the line suggest the order to teach the themes.



## How to use the mixed-age SOL

Here is an example of one of the themes from the Year 1/2 mixed-age guidance.

### Subtraction

#### Year 1 (Aut B2, Spr B1)

- How many left? (1)
- How many left? (2)
- Counting back
- Subtraction - not crossing 10
- Subtraction - crossing 10 (1)
- Subtraction - crossing 10 (2)

#### Year 2 (Aut B2, B3)

- Subtract 1-digit from 2-digits
- Subtract with 2-digits (1)
- Subtract with 2-digits (2)
- Find change - money

In order to create a more coherent journey for mixed-age classes, we have re-ordered some of the single-age steps and combined some blocks of learning e.g. Money is covered within Addition and Subtraction.

The bullet points are the names of the small steps from the single-age SOL. We have referenced where the steps are from at the top of each theme e.g. Aut B2 means Autumn term, Block 2. Teachers will need to access both of the single-age SOLs from our website together with this mixed-age guidance in order to plan their learning.

### Points to consider

- Use the mixed-age schemes to see where similar skills from both year groups can be taught together. Learning can then be differentiated through the questions on the single-age small steps so both year groups are focusing on their year group content.
- When there is year group specific content, consider teaching in split inputs to classes. This will depend on support in class and may need to be done through focus groups .
- On each of the block overview pages, we have described the key learning in each block and have given suggestions as to how the themes could be approached for each year group.
- We are fully aware that every class is different and the logistics of mixed-age classes can be tricky. We hope that our mixed-age SOL can help teachers to start to draw learning together.

# Guidance

## Common Content

In this section, content from single-age blocks are matched together to show teachers where there are clear links across the year groups. Teachers may decide to teach the lower year's content to the whole class before moving the higher year on to their age-related expectations. The lower year group is not expected to cover the higher year group's content as they should focus on their own age-related expectations.

In this section, content that is discrete to one year group is outlined. Teachers may need to consider a split input with lessons or working with children in focus groups to ensure they have full coverage of their year's curriculum. Guidance is given on each page to support the planning of each block.

Year 4 content

Year 5 content

**The themes should be taught in order from left to right.**

## Year Specific

	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			Measurement: Length, Perimeter and Area	
Spring	Number: Multiplication and Division			Number: Fractions					Number: Decimals (including Y5 Percentages)			
Summer	Number: Decimals (including Y4 Money)		Measurement: Time	Statistics		Geometry: Properties of Shape		Geometry: Position and Direction	Y4: Consolidation		Consolidation	
							Y5: Converting Units & Volume					

# Place Value

## Common Content

### Roman Numerals

- Year 4 (Aut B1)
  - Roman Numerals to 100
- Year 5 (Aut B1)
  - Roman Numerals to 1,000

### Representing numbers

- Year 4 (Aut B1)
  - 1000s, 100s, 10s and 1s
  - Partitioning
  - Number line to 10,000
- Year 5 (Aut B1)
  - Numbers to 10,000
  - Number to 100,000
  - Numbers to a million

### Counting

- Year 4 (Aut B1)
  - Count in 1,000s
  - 1,000 more or less
  - Count in 25s
- Year 5 (Aut B1)
  - Counting in 10s, 100s, 1,000s, 10,000s and 100,000s

### Compare and order

- Year 4 (Aut B1)
  - Compare numbers
  - Order numbers
- Year 5 (Aut B1)
  - Compare and order numbers to 100,000
  - Compare and order numbers to one million

### Rounding

- Year 4 (Aut B1)
  - Round to the nearest 10
  - Round to the nearest 100
  - Round to the nearest 1,000
- Year 5 (Aut B1)
  - Round to the nearest 10, 100 and 1,000
  - Round numbers within 100,000
  - Round numbers to one million

### Negative Numbers

- Year 4 (Aut B1)
  - Negative numbers
- Year 5 (Aut B1)
  - Negative numbers



Year 4 and 5 have a great deal of common content in this block.

Year 4 work with numbers up to 10,000 while Year 5 work with numbers to one million. Year 5 may recap Year 4 content before moving onto similar ideas with larger numbers e.g. comparing and ordering and rounding.

## Year Specific

**White**

**Rose  
Maths**

**Block 1 - Place Value**

**Theme 1 - Roman numerals**

# Roman Numerals

## Notes and Guidance

Children will build on their knowledge of numerals to 12 on a clock face, from Year 3, to explore Roman Numerals to 100

They explore what is the same and what is different between the number systems, including the fact that in the Roman system there is no symbol for zero and so no placeholders.

## Mathematical Talk

Why is there no zero in the Roman Numerals? What might it look like?

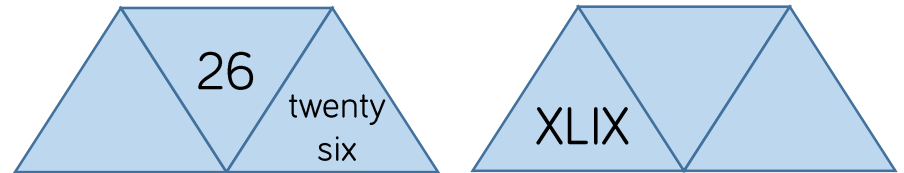
Can you spot any patterns? If 20 is XX what might 200 be?

How can you check you have represented the Roman Numeral correctly? Can you use numbers you know, such as 10 and 100 to help you?

## Varied Fluency

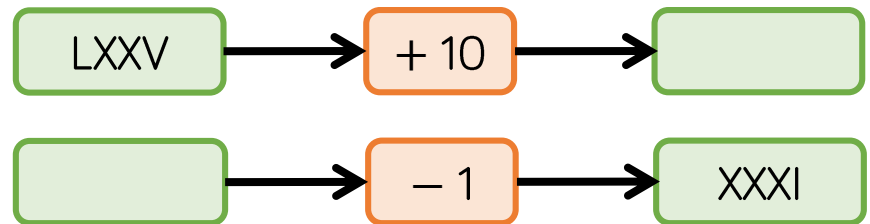
- Lollipop stick activity.  
 The teacher shouts out a number and the children make it with lollipop sticks.  
 Children could also do this in pairs or groups, and for a bit of fun they could test the teacher!

- Each diagram shows a number in numerals, words and Roman Numerals.



Complete the diagrams.

- Complete the function machines.





# Roman Numerals

## Reasoning and Problem Solving

Solve the following calculation:

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

How many other calculations, using Roman Numerals, can you write to get the same total?

Answer: L

Other possible calculations include:

$$C \div II = L$$

$$L \div I = L$$

$$X \times V = L$$

$$XXV \times II = L$$

$$LXV - XV = L$$

$$C - L = L$$

$$XX + XX + X = L$$

Mo says:

In the 10 times table, all the numbers have a zero. Therefore, in Roman Numerals all multiples of 10 have an X



Research and give examples to prove whether or not Mo is correct.

Mo is incorrect. A lot of multiples of 10 have an X in them, but the X can mean different things depending on its position. For example, X in 10 just means one ten, but X in XL means 10 less than 50. X in 60 (LX) means 10 more than 50. The number 50 has no X and neither does 100.

# Roman Numerals

## Notes and Guidance

Building on their knowledge of Roman Numerals to 100, from Year 4, children explore Roman Numerals to 1,000

They explore what is the same and what is different about the number systems, for example there is no zero in the Roman system.

Writing the date in Roman Numerals could be introduced and so this concept can be revisited every day.

## Mathematical Talk

Why is there no zero in Roman Numerals?

Do you notice any patterns in the Roman number system?

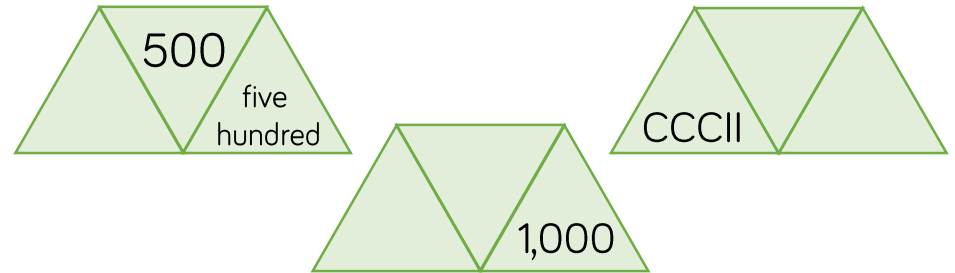
How can you check you have represented the Roman Numeral correctly?

Can you use numbers you know, such as 1, 10 and 100 to help you?

## Varied Fluency

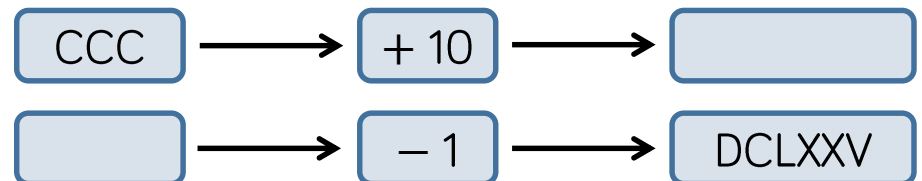
- Lollipop stick activity.  
 The teacher shouts out a number and the children make it with lollipop sticks.  
 Children could also do this in pairs or groups, or for a bit of fun they could test the teacher!

- Each diagram shows a number in digits, words and Roman Numerals.



Complete the diagrams.

- Complete the function machines.



# Roman Numerals

## Reasoning and Problem Solving

Solve

$$\text{CCCL} + \text{CL} =$$

How many calculations, using Roman Numerals, can you write to get the same total?

Possible answers:

- CD + C
- M ÷ II
- C + CC + CC
- C × V

Here is part of a Roman Numerals hundred square.

Complete the missing values.

XLIV	XLV		XLVII
		LVI	LVII
LXIV		LXVI	LXVII

What patterns do you notice?

Missing Roman Numerals from the top row and left to right:

- XLVI
- LIV
- LV
- LXV

**White**

**Rose  
Maths**

**Block 1 - Place Value**

**Theme 2 - Representing numbers**

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

## Notes and Guidance

Children represent numbers to 9,999, using concrete resources on a place value grid. They understand that a four-digit number is made up of 1,000s, 100s, 10s and 1s.

Moving on from Base 10 blocks, children start to partition by using place value counters and digits.

## Mathematical Talk

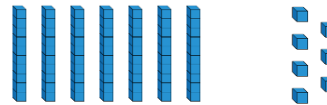
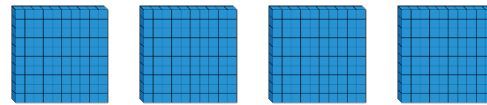
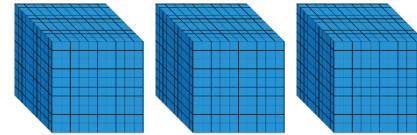
Can you represent the number on a place value grid?  
How many thousands/hundreds/tens/ones are there?

How do you know you have formed the number correctly? What could you use to help you?

How is the value of zero represented on a place value grid or in a number?

## Varied Fluency

Complete the sentences.

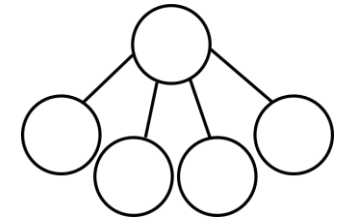
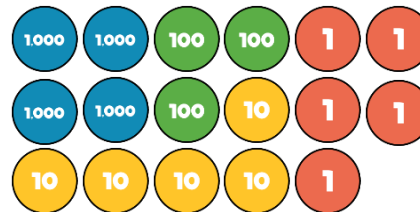


There are \_\_\_\_\_ thousands,  
\_\_\_\_\_ hundreds, \_\_\_\_\_  
tens and \_\_\_\_\_ ones.

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

\_\_\_ + \_\_\_ + \_\_\_ + \_\_\_ = \_\_\_

Complete the part-whole model for the number represented.



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

6,983

9,021

789

6,570

Represent each of the numbers on a place value grid.

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

## Reasoning and Problem Solving

Create four 4-digit numbers to fit the following rules:

- The tens digit is 3
- The hundreds digit is two more than the ones digit
- The four digits have a total of 12

Possible answers:

3,432  
5,331  
1,533  
7,230

Use the clues to find the missing digits.



The thousands and tens digit multiply together to make 36

The hundreds and tens digit have a digit total of 9

The ones digit is double the thousands digit.

The whole number has a digit total of 21

4,098

# Partitioning

## Notes and Guidance

Children explore how numbers can be partitioned in more than one way.

They need to understand that, for example,  $5000 + 300 + 20 + 9$  is equal to  $4000 + 1300 + 10 + 19$

This is crucial to later work on adding and subtracting 4-digit numbers and children explore this explicitly.

## Mathematical Talk

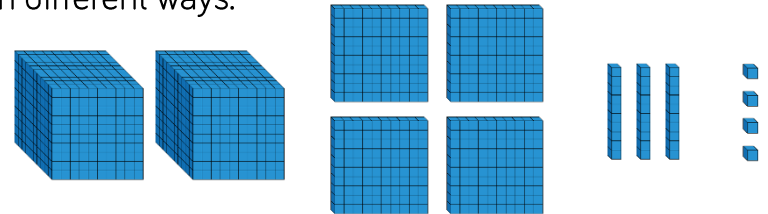
What number is being represented?

If we have 10 hundreds, can we exchange them for something?

If you know ten 100s are equal to 1,000 or ten 10s are equal to 100, how can you use this to make different exchanges?

## Varied Fluency

- Move the Base 10 around and make exchanges to represent the number in different ways.

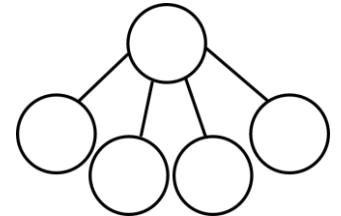
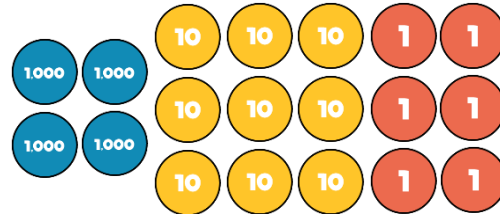


$$2000 + 400 + \boxed{\phantom{000}} + 4$$

$$1000 + \boxed{\phantom{000}} + \boxed{\phantom{000}} + 14$$

$$1000 + 1300 + \boxed{\phantom{000}} + \boxed{\phantom{000}}$$

- Represent the number in two different ways in a part-whole model.



- Eva describes a number. She says, "My number has 4 thousands and 301 ones" What is Eva's number? Can you describe Eva's number in a different way?

# Partitioning

## Reasoning and Problem Solving

Which is the odd one out?

3,500

3,500 ones

2 thousands  
and 15 hundreds

35 tens

35 tens is the odd one out because it does not make 3,500, it makes 350

Explain how you know.

Jack says:



My number has five thousands, three hundreds and 64 ones.

They both have the same number because 53 hundreds is equal to 5 thousands and 3 hundreds. Jack and Amir both have 5,364

My number has fifty three hundreds, 6 tens and 4 ones.

Amir says:



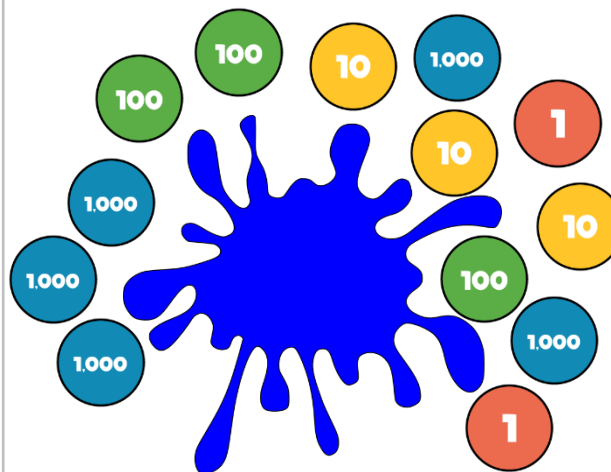
Who has the largest number?  
Explain.

Some place value counters are hidden.

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

Which place value counters could be hidden?

Think of at least three solutions.



Possible answers:

One 1,000 counter and one 100 counter.

Ten 100 counters and ten 10 counters.

Eleven 100 counters.



# Number Line to 10,000

## Notes and Guidance

Children estimate, label and draw numbers on a number line to 10,000

They need to understand that it is possible to count forwards or backwards, in equal steps, from both sides.

Number lines should be shown with or without start and end numbers, or with numbers already placed on it.

## Mathematical Talk

Which side of the number line did you start from? Why?

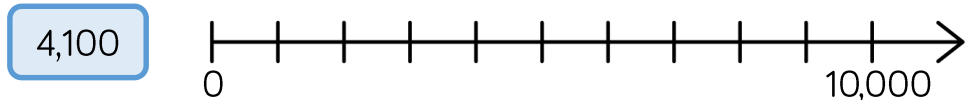
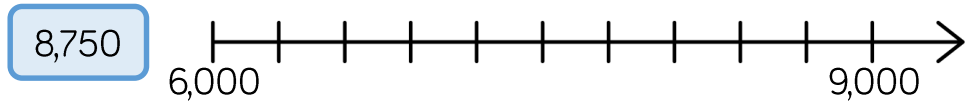
When estimating where a number should be placed, on a number line, what can help you?

Can you use your knowledge of place value to prove that you are correct?

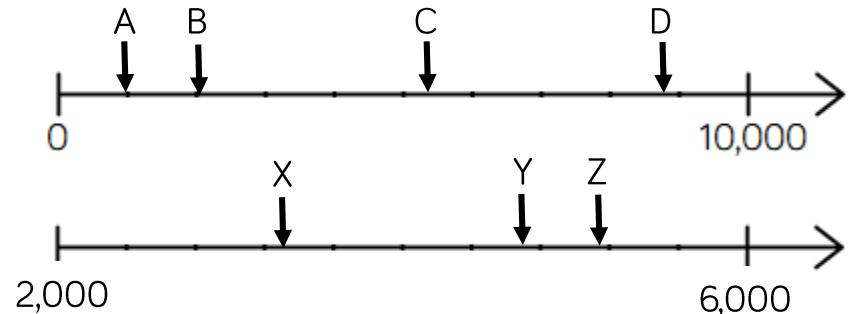
When a number line has no values at the end, what strategies could you use to help you figure out the missing value? Could there be more than one answer?

## Varied Fluency

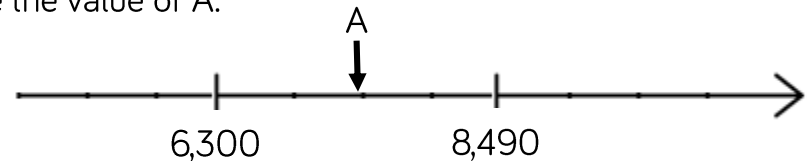
Draw arrows to show where the numbers would be on the number line.



Estimate the value of each letter.



Estimate the value of A.



# Number Line to 10,000

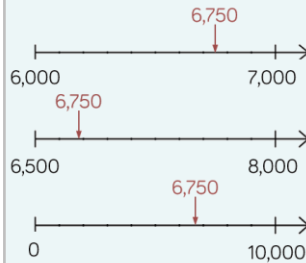
## Reasoning and Problem Solving

Place 6,750 on each of the number lines.

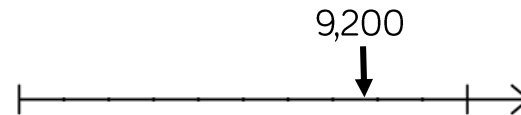


Are they in the same place on each line? Why?

No, each line has different numbers at the start and end so the position of 6,750 changes.



If the number on the number line is 9,200, what could the start and end numbers be?  
Find three different possible answers.



Possible answers:

- 8,400 – 9,500
- 5,000 – 10,000
- 9,120 – 9,920

# Numbers to 10,000

## Notes and Guidance

Children use concrete manipulatives and pictorial representations to recap representing numbers up to 10,000

Within this step, children must revise adding and subtracting 10, 100 and 1,000

They discuss what is happening to the place value columns, when carrying out each addition or subtraction.

## Mathematical Talk

Can you show me 8,045 (any number) in three different ways?

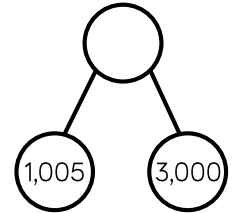
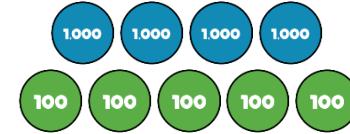
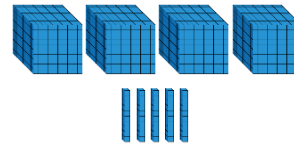
Which representation is the odd one out? Explain your reasoning.

What number could the arrow be pointing to?

Which column(s) change when adding 10, 100, 1,000 to 2,506?

## Varied Fluency

Match the diagram to the number.

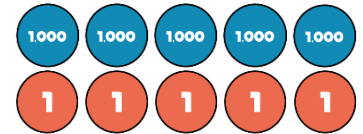
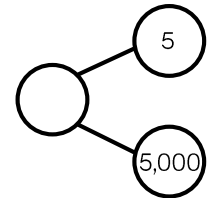
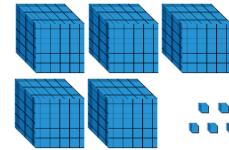


4,005

4,500

4,050

Which diagram is the odd one out?



Complete the table.

	Add 10	Add 100	Add 1,000
2,506			
7,999			
		6,070	

# Numbers to 10,000

## Reasoning and Problem Solving

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

She has changed each number into a letter.

Her numbers are

- aabcd
- acdbc
- dcaba
- cdadc
- bdaab

Here are three clues to work out her numbers:

- The first number in her list is the greatest number.
- The digits in the fourth number total 12
- The third number in the list is the smallest number.

- 44,213
- 43,123
- 13,424
- 31,413
- 21,442

Tommy says he can order the following numbers by only looking at the first three digits.

12,516	12,832
12,679	
12,538	12,794

Is he correct?

Explain your answer.

He is incorrect because two of the numbers start with twelve thousand, five hundred therefore you need to look at the tens to compare and order.

# Numbers to 100,000

## Notes and Guidance

Children focus on numbers up to 100,000  
They represent numbers on a place value grid, read and write numbers and place them on a number line to 100,000

Using a number line, they find numbers between two points, place a number and estimate where larger numbers will be.

## Mathematical Talk

- How can the place value grid help you to add 10, 100 or 1,000 to any number?
- How many digits change when you add 10, 100 or 1,000? Is it always the same number of digits that change?
- How can we represent 65,048 on a number line?
- How can we estimate a number on a number line if there are no divisions?
- Do you need to count forwards and backwards to find out if a number is in a number sequence? Explain.

## Varied Fluency

A number is shown in the place value grid.

10,000s	1,000s	100s	10s	1s
5	1	4	14	8

Write the number in figures and in words.

- Alex adds 10 to this number
- Tommy adds 100 to this number
- Eva adds 1,000 to this number

Write each of their new numbers in figures and in words.

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

Counters	65,048	Part-whole model
Bar model		Number line

Complete the missing numbers.

$$59,000 = 50,000 + \underline{\hspace{2cm}}$$

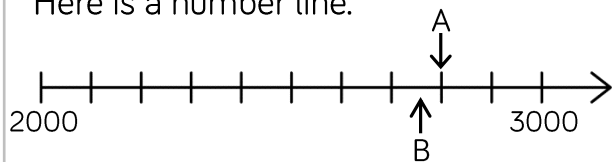
$$\underline{\hspace{2cm}} = 30,000 + 1,700 + 230$$

$$75,480 = \underline{\hspace{2cm}} + 300 + \underline{\hspace{2cm}}$$

# Numbers to 100,000

## Reasoning and Problem Solving

Here is a number line.



What is the value of A?

B is 40 less than A.

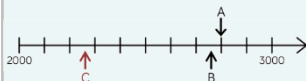
What is the value of B?

C is 500 less than B.

Add C to the number line.

$$A = 2,800$$

$$B = 2,760$$



Here are three ways of partitioning 27,650

27 thousands and 650 ones

27 thousands, 5 hundreds and 150 ones

27 thousands and 65 tens

Write three more ways

Possible answers:

2 ten thousands, 6 hundreds and 5 tens

20 thousands, 7 thousands and 650 ones

Rosie counts forwards and backwards in 10s from 317

Circle the numbers Rosie will count.

427

997

-7

1,666

3,210

5,627

-23

7

-3

Explain why Rosie will not say the other numbers.

427

997

5,627

7

-3

-23

Any positive number will have to end in a 7

Any negative number will have to end in a 3

# Numbers to One Million

## Notes and Guidance

Children read, write and represent numbers to 1,000,000

They will recognise large numbers represented in a part-whole model, when they are partitioned in unfamiliar ways.

Children need to see numbers represented with counters on a place value grid, as well as drawing the counters.

## Mathematical Talk

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

Show me 800,500 represented in three different ways.  
Can 575,400 be partitioned into 4 parts in a different way?

Where do the commas go in the numbers?  
How does the place value grid help you to represent large numbers?

Which columns will change in value when Eva adds 4 counters to the hundreds column to the hundreds column?

## Varied Fluency

Thousands			Ones		
H	T	O	H	T	O

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

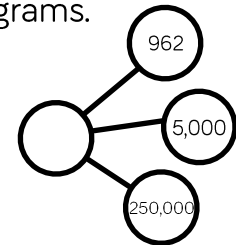
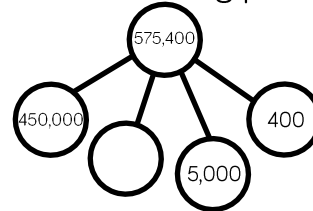
32,651

456,301

50,030

Can you say the numbers out loud?

Complete the following part-whole diagrams.



Eva has the following number.

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

She adds 4 counters to the hundreds column.

23 What is her new number?

# Numbers to One Million

## Reasoning and Problem Solving

Describe the value of the digit 7 in each of the following numbers. How do you know?

407,338

700,491

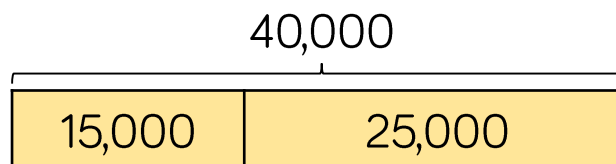
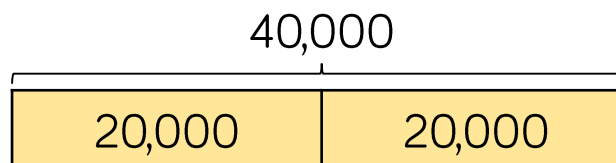
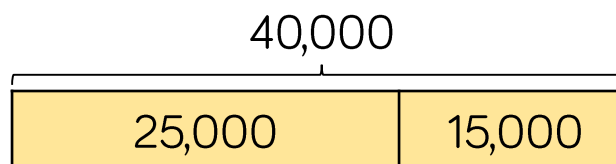
25,571

407,338: the value is 7 thousand. It is to the left of the hundreds column.

700,491: the value is 7 hundred thousand. It is a 6-digit number and there are 5 other numbers in place value columns to the right of this number.

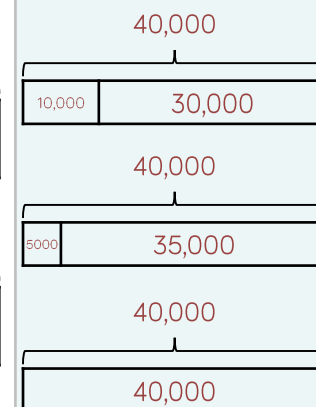
25,571: the value is 7 tens. It is one column to the left of the ones column.

The bar models are showing a pattern.



Draw the next three.

Create your own pattern of bar models for a partner to continue.





**White**

**Rose  
Maths**

**Block 1 - Place Value**

**Theme 3 - Counting**

## Count in 1,000s

### Notes and Guidance

Children look at four-digit numbers for the first time. They explore what a thousand is through concrete and pictorial representations, to recognise that 1,000 is made up of ten hundreds.

They count in multiples of 1,000, representing numbers in numerals and words.

### Mathematical Talk

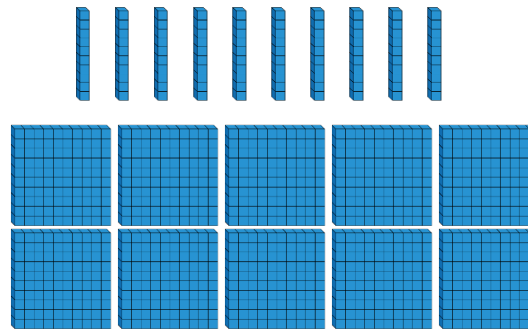
How many hundreds are there in one thousand?  
 How many hundreds make \_\_\_\_ thousands?

How is counting in thousands similar to counting in 1s?

When counting in thousands, which is the only digit to change?

How many sweets would there be in \_\_\_\_ jars?

### Varied Fluency



\_\_\_\_ tens make \_\_\_\_ hundred.

\_\_\_\_ hundreds make \_\_\_\_ thousand.



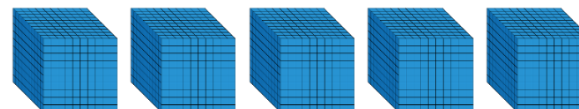
How many sweets are there altogether?



There are three jars of \_\_\_\_ sweets.  
 There are \_\_\_\_ sweets altogether.



What numbers are represented below?



## Count in 1,000s

### Reasoning and Problem Solving

#### Always, Sometimes, Never

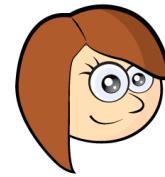
- When counting in hundreds, the ones digit changes.
- The thousands column changes every time you count in thousands.
- To count in thousands, we use 4-digit numbers.

Never, when counting in hundreds, the ones digit always stays the same.

Always, the thousands column changes every time you count in thousands.

Sometimes, to count in thousands, we use 4-digit numbers.

Rosie says,



If I count in thousands from zero, I will always have an even answer.

True or false?  
Explain how you know.

True, because they all end in zero, which are multiples of 10 and multiples of 10 are even.

# 1,000 More or Less

## Notes and Guidance

Children have explored finding 1, 10 and 100 more or less, in Year 3. They now extend their learning by finding 1,000 more or less than a given number.

Show children that they can represent their answer in a number of ways, for example using place value counters, Base 10 or numerals.

## Mathematical Talk

What is 1,000 more than/less than a number?  
Which column changes when I find 1,000 more or less?

What happens when I subtract 1,000 from 9,209?

Can you show me two different ways of showing 1,000 more/less than e.g. pictures, place value charts, equipment.

Complete this sentence: I know that 1,000 more than \_\_\_\_ is \_\_\_\_ because ... I can prove this by \_\_\_\_.

## Varied Fluency

Fill in the missing values.

$$9,523 + 10 = \boxed{\phantom{000}}$$

$$\boxed{\phantom{000}} + 3,589 = 3,689$$

$$3,891 + \boxed{\phantom{000}} = 4,891$$

Complete the table.

1,000 less	Number	1,000 more

Find 1,000 more and 1,000 less than each number.

5,000

7,500

2,359

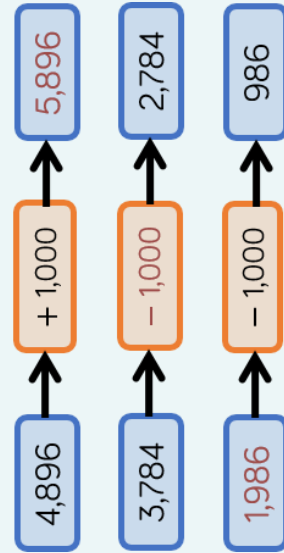
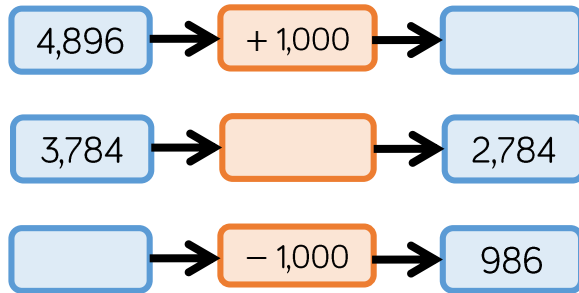
8,999

Use concrete resources to prove you are correct.

# 1,000 More or Less

## Reasoning and Problem Solving

Complete the missing boxes:



10 less than my number is 1,000 more than 5,300. What is my number?

6,310

Can you write your own problem similar to this?

Jack says:

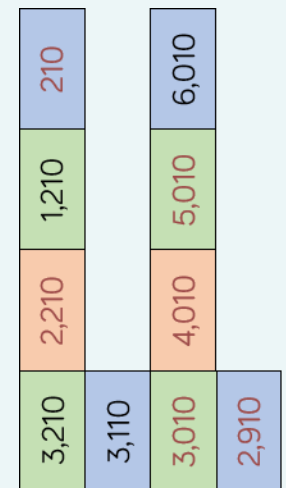
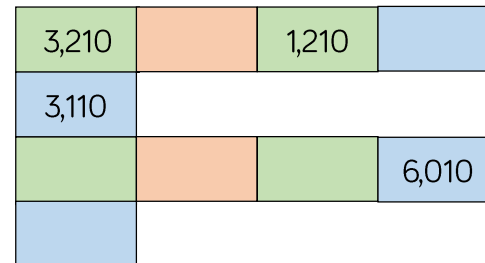


When I add 1,000 to 4,325, I only have to change 1 digit.

Is he correct?  
Which digit does he need to change?

Yes, he is correct. He will need to change the thousands digit (4).

Fill in the boxes by finding the patterns:



## Count in 25s

### Notes and Guidance

Children will count in 25s to spot patterns. They use their knowledge of counting in 50s and 100s to become fluent in 25s.

Children should recognise and use the number facts that there are two 25s in 50 and four 25s in 100.

### Mathematical Talk

What is the first/second number pattern counting up in?  
 Can you notice a pattern as the numbers increase/decrease?  
 Are any numbers in both of the number patterns? Why?

What digit do multiples of 25 end in?

What's the same and what's different when counting in 50s and 25s?

### Varied Fluency

- Look at the number patterns.  
 What do you notice?

25	50	75	100	125	150
----	----	----	-----	-----	-----

50	100	150	200	250	300
----	-----	-----	-----	-----	-----

- Complete the number tracks

25		75		125	150				250
----	--	----	--	-----	-----	--	--	--	-----

	725	700		650		600			
--	-----	-----	--	-----	--	-----	--	--	--

- Circle the mistake in each sequence.

2, 275      2,300      2,325      2,350      2,400, ...

1,000      975      925      900      875 ...

# Count in 25s

## Reasoning and Problem Solving

Whitney is counting in 25s and 1,000s. She says:

- Multiples of 1,000 are also multiples of 25
- Multiples of 25 are therefore multiples of 1,000

Do you agree with Whitney? Explain why.

I don't agree. Multiples of 1,000 are multiples of 25 because 25 goes into 1,000 exactly, but not all multiples of 25 are multiples of 1,000 e.g. 1,075

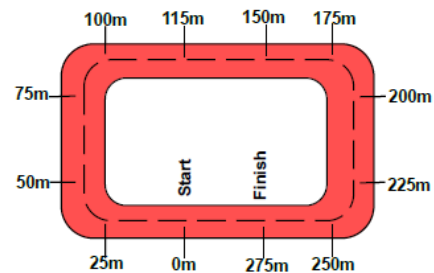
Ron is counting down in 25s from 790. Will he say 725?

Explain your answer.

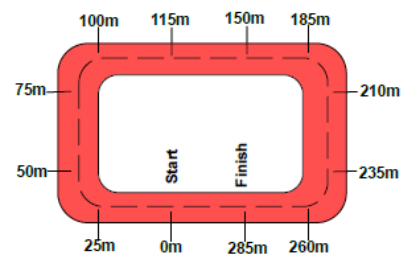
No, he will not say 725 because:  
790, 765, 740, 715, 690, 665, ...

Two race tracks have been split into 25m intervals.

*Race track A*



*Race track B*



What errors have been made?

Possible answers:

Race track A has miscounted when adding 25 m to 100 m. After this they have continued to count in 25s correctly from 150

Race track B has miscounted when adding 25 m to 150 m. They have then added 25 m from this point.

# Counting in Powers of 10

## Notes and Guidance

Children complete number sequences and can describe the term-to-term rule e.g. add ten each time. It is important to include sequences that go down as well as those that go up.

They count forwards and backwards in powers of ten up to 1,000,000

## Mathematical Talk

Will there be any negative numbers in this sequence?

What pattern do you begin to see with the positive and negative numbers in the sequence?

What patterns do you notice when you compare sequences increasing or decreasing in 10s, 100s, 1,000s etc.?

Can you create a rule for the sequence?

## Varied Fluency

Complete the sequence.

\_\_\_\_, \_\_\_\_, 2, \_\_\_\_, 22, \_\_\_\_, 42, \_\_\_\_, \_\_\_\_, 72

The rule for the sequence is \_\_\_\_\_.

Circle and correct the mistake in each sequence.

- 7,875, 8,875, 9,875, 11,875, 12,875, 13,875, ...
- 864,664, 764,664, 664,664, 554,664, 444,664, ...

Here is a Gattegno chart showing 32,450

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

Cards

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

Give children a target number to make then let them choose a card. Children then need to adjust their number on the chart.



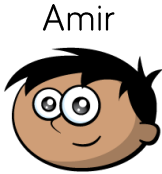
# Counting in Powers of 10

## Reasoning and Problem Solving

Amir writes the first five numbers of a sequence.

They are  
3,666, 4,666, 5,666, 6,666, 7,666

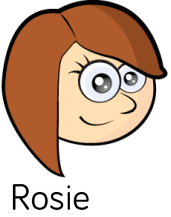
The 10<sup>th</sup> term will be 15,322 because I will double the 5<sup>th</sup> term.



The 10<sup>th</sup> term is 12,666 because Amir is adding 1,000 each time. He should have added 5,000 not doubled the 5<sup>th</sup> term.

Is he correct?  
Explain why.

I am counting up in 10s from 184  
I will include 224



I am counting up in 100s from 604  
I will include 1,040

I am counting up in 1,000s from 13  
I will include 130,000



Rosie has made a mistake. She is counting in 100s; therefore the ones column should never change.

Jack has also made a mistake as he is counting in 1,000s, so the tens and ones columns won't change.

Who has made a mistake?  
Identify anyone who has made a mistake and explain how you know.

**White**

**Rose  
Maths**

**Block 1 - Place Value**

**Theme 4 - Compare and order**

# Compare 4-digit Numbers

## Notes and Guidance

Children compare 4-digit numbers using comparison language and symbols to determine/show which is greater and which is smaller.

Children should represent numbers using concrete manipulatives, draw them pictorially and write them using numerals.

## Mathematical Talk

Which two numbers are being represented?

Do you start counting the thousands, hundreds, tens or ones first? Why?

Which column do you start comparing from? Why?

What strategy did you use to compare the two numbers? Is this the same or different to your partner?

How many answers can you find?

## Varied Fluency

Complete the statements using  $<$ ,  $>$  or  $=$

	○	
	○	
	○	
5,689		5,892

Circle the smallest amount in each pair.

- |  |       |
|--|-------|
| Two thousand, three hundred and ninety seven | 3,792 |
| $6,000 + 400 + 50 + 6$                       | 6,455 |
| 9 thousands, 2 hundreds and 6 ones           | 9,602 |

Complete the statements.

$$1,985 > \underline{\quad}$$

$$4,203 < 4,000 + \underline{\quad} + 4$$

# Compare 4-digit Numbers

## Reasoning and Problem Solving

I am thinking of a number. It is greater than 3,000, but smaller than 5,000

The digits add up to 15  
What could the number be?

Write down as many possibilities as you can.

The difference between the largest and smallest digit is 6. How many numbers do you now have?

I have 13 numbers:

- 3,228
- 3,282
- 3,822
- 4,560
- 4,650
- 4,506
- 4,605
- 3,660
- 3,606
- 3,147
- 3,174
- 3,417
- 3,471

Use digit cards 1 to 5 to complete the comparisons:

$$564 \square < \square 73 \square$$

$$2 \square 38 > 23 \square 5$$

You can only use each digit once.

Possible answer:

$$5641 < 5732$$

$$2438 > 2335$$

# Order Numbers

## Notes and Guidance

Children explore ordering a set of numbers in ascending and descending order. They reinforce their understanding by using a variety of representations.

Children find the largest or smallest number from a set.

## Mathematical Talk

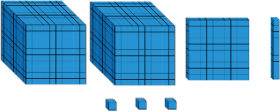
Which number is the greatest? Which number is smallest?  
How do you know?

Why have you chosen to order the numbers this way?

What strategy did you use to solve this problem?

## Varied Fluency

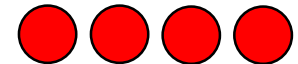
Fill in the circle using  $<$ ,  $>$  or  $=$

2,764    XXVII

Here are four digit cards:

Arrange them to make as many different 4-digit numbers as you can and put them in ascending order.

Rearrange four counters in the place value chart to make different numbers.



1000s	100s	10s	1s

Record all your numbers and write them in descending order.

# Order Numbers

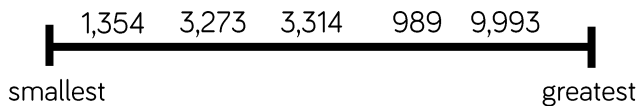
## Reasoning and Problem Solving

Alex has ordered five 4-digit numbers. The smallest number is 3,450, and the largest number is 3,650

All the other numbers have digit totals of 20

What could the other three numbers be?

What mistake has been made?



3,476

3,584

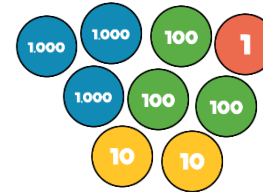
3,593

The number 989 is in the wrong place. A common misconception could be that the first digit is a high number the whole number must be large. They have forgotten to check how many digits there are in the number before ordering.

Put these amounts in ascending order.

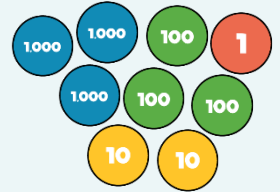
Half of 2,400

LXXXVI



LXXXVI

Half of 2,400



Put one number in each box so that the list of numbers is ordered smallest to largest.

1000s	100s	10s	1s
1	1		3
1		2	7
1	2	5	
1		5	9
1	3	8	
1		1	5

Can you find more than one way?

Possible answer:

1000s	100s	10s	1s
1	1	1	3
1	1	2	7
1	2	5	0
1	3	5	9
1	3	8	4
1	4	1	5

# Compare and Order

## Notes and Guidance

Children will compare and order numbers up to 100,000 by applying their understanding from Year 4 and how numbers can be represented in different ways.

Children should be able to compare and order numbers presented in a variety of ways, e.g. using place value counters, part-whole models, Roman numerals etc.

## Mathematical Talk

In order to compare numbers, what do we need to know?

What is the value of each digit in the number 63,320?

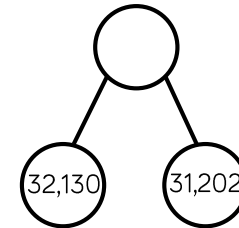
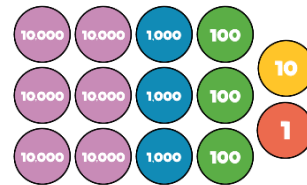
What is the value of \_\_\_\_\_ in this number?

What is the value of the whole? Can you suggest other parts that make the whole?

What number does MMXVII represent?

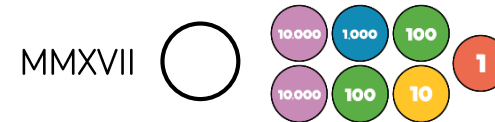
## Varied Fluency

Put these numbers in ascending order.

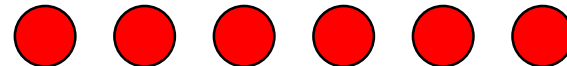


10,000s	1,000s	100s	10s	1s
6	3	3	2	0

Add the symbol  $<$ ,  $>$  or  $=$  to make the statement correct.



Use six counters to make five different 5-digit numbers.



10,000s	1,000s	100s	10s	1s

Order your numbers from greatest to smallest.

# Compare and Order

## Reasoning and Problem Solving

Place the digit cards 0 to 9 face down and select five of them.

Make the greatest number possible and the smallest number possible.

How do you know which is the greatest or smallest?

Dependent on numbers chosen.  
e.g. 4, 9, 1, 3, 2

Smallest: 12,349  
Greatest: 94,321

I know this is the greatest number because the digit cards with the larger numbers are in the place value columns with the greater values.

Using the digit cards 0 to 9, create three different 5-digit numbers that fit the following clues:

- The digit in the hundreds column and the ones column have a difference of 2
- The digit in the hundreds column and the ten thousands column has a difference of 2
- The sum of all the digits totals 19

Possible answers include:

47,260  
56,341  
18,325  
20,476



# Compare and Order

## Notes and Guidance

Children compare and order numbers up to 1,000,000 using comparison vocabulary and symbols.

They use a number line to compare numbers, and look at the importance of focusing on the column with the highest place value when comparing numbers.

## Mathematical Talk

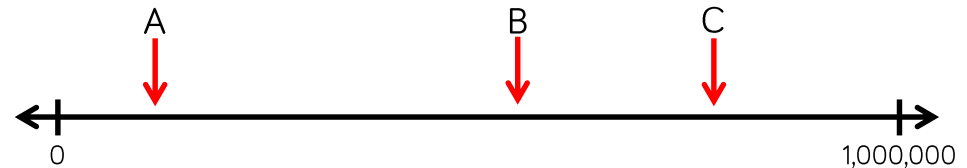
- What do we need to know to be able to compare and order large numbers?
- Why can't we just look at the thousands columns when we are ordering these five numbers?
- What is the value of each digit?
- What is the value of \_\_\_\_ in this number?
- What is the value of the whole? Can you suggest other parts that make the whole?
- Can you write a story to support your part-whole model?

## Varied Fluency

Put the number cards in order of size.

13,010    13,100    13,011    13,110    13,111

Estimate the values of A, B and C.



Here is a table showing the population in areas of Yorkshire.

Halifax	88,134
Brighouse	32,360
Leeds	720,492
Huddersfield	146,234
Wakefield	76,886
Bradford	531,200

Use  $<$ ,  $>$  or  $=$  to make the statements correct.

The population of Halifax  the population of Wakefield.

Double the population of Brighouse  the population of Halifax.

# Compare and Order

## Reasoning and Problem Solving

The missing number is an odd number.

When rounded to the nearest 10,000 it is 440,000

The sum of the digits is 23



Greatest

Smallest

What could the number be?

Can you find three possibilities?

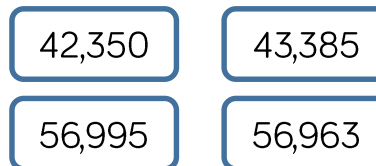
Possible answers include:

444,812

435,812

439,502

Here are four number cards.



Four children take one each and say a clue.

My number is 57,000 when rounded to the nearest 100



Mo



Rosie

My number has exactly three hundreds in it

My number is 43,000 when rounded to the nearest thousand



Jack



Dora

My number is exactly 100 less than 57,063

Mo: 56,995

Rosie: 42,350

Jack: 43,385

Dora: 56,963

Which card did each child have?

**White**

**Rose  
Maths**

**Block 1 - Place Value**

**Theme 5 - Rounding**

# Round to the Nearest 10

## Notes and Guidance

Children start to look at the position of a 2-digit number on a number line. They then apply their understanding to 3-digit numbers, focusing on the number of ones and rounding up or not.

Children must understand the importance of 5 and the idea that although it is in the middle of 0 and 10, that by convention any number ending in 5 is always rounded up, to the nearest 10

## Mathematical Talk

What is a multiple of 10?

Which multiples of 10 does \_\_\_\_ sit between?

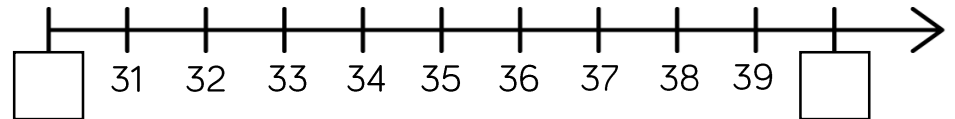
Which column do we look at when rounding to the nearest 10?

What do we do if the number in that column is a 5?

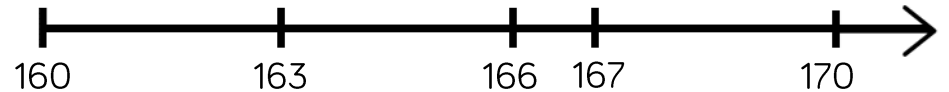
Which number is being represented? Will we round it up or not? Why?

## Varied Fluency

Which multiples of 10 do the numbers sit between?



Say whether each number on the number line is closer to 160 or 170?



Round 163, 166 and 167 to the nearest 10

Complete the table:

Start number	Rounded to the nearest 10
851	
XCVIII	

# Round to the Nearest 10

## Reasoning and Problem Solving

A whole number is rounded to 370  
 What could the number be?  
 Write down all the possible answers.

370

- 365
- 366
- 367
- 368
- 369
- 370
- 371
- 372
- 373
- 374

Two different two-digit numbers both round to 40 when rounded to the nearest 10

The sum of the two numbers is 79

What could the two numbers be?

Is there more than one possibility?

- $35 + 44 = 79$
- $36 + 43 = 79$
- $37 + 42 = 79$
- $38 + 41 = 79$
- $39 + 40 = 79$

Whitney says:



847 to the nearest 10 is 840

Do you agree with Whitney?

Explain why.

I don't agree with Whitney because 847 rounded to the nearest 10 is 850. I know this because ones ending in 5, 6, 7, 8 and 9 round up.

# Round to the Nearest 100

## Notes and Guidance

Children compare rounding to the nearest 10 (looking at the ones column) to rounding to the nearest 100 (looking at the tens column.)

Children use their knowledge of multiples of 100, to understand which two multiples of 100 a number sits between. This will help them to round 3-digit numbers to the nearest 100

## Mathematical Talk

What's the same/different about rounding to the nearest 10 and nearest 100? Which column do we need to look at when rounding to the nearest 100?

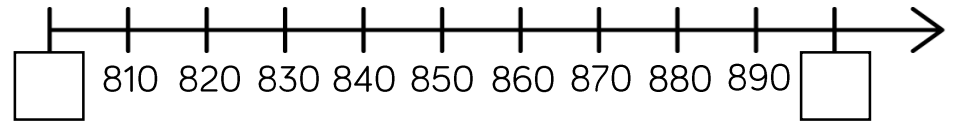
Why do numbers up to 49 round down to the nearest 100 and numbers 50 to 99 round up?

What would 49 round to, to the nearest 100?

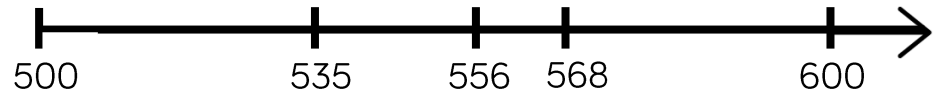
Can the answer be 0 when rounding?

## Varied Fluency

Which multiples of 100 do the numbers sit between?



Say whether each number on the number line is closer to 500 or 600.



Round 535, 556 and 568 to the nearest 100

Use the stem sentence: \_\_\_\_ rounded to the nearest 100 is \_\_\_\_.

Complete the table:

Start number	Rounded to the nearest 100
994	
XLV	

# Round to the Nearest 100

## Reasoning and Problem Solving

### Always, Sometimes, Never

Explain your reasons for each statement.

- A number with a five in the tens column rounds up to the nearest hundred.
- A number with a five in the ones column rounds up to the nearest hundred.
- A number with a five in the hundreds column rounds up to the nearest hundred.

*Always – a number with five in the tens column will be 50 or above so will always round up.*

*Sometimes – a number with five in the ones column might have 0 to 4 in the tens column (do not round up) or 5 to 9 (round up).*

*Sometimes – a number with five in the hundreds column will also round up or down dependent on the number in the tens column.*

When a whole number is rounded to the nearest 100, the answer is 200

When the same number is rounded to the nearest 10, the answer is 250

What could the number be?

Is there more than one possibility?

Using the digit cards 0 to 9, can you make whole numbers that fit the following rules? You can only use each digit once.

1. When rounded to the nearest 10, I round to 20
2. When rounded to the nearest 10, I round to 10
3. When rounded to the nearest 100, I round to 700

*245, 246, 247, 248 and 249 are all possible answers.*

*To 20, it could be 15 to 24*

*To 10, it could be 5 to 14*

*To 700, it could be 650 to 749*

*Use each digit once: 5, 24, 679 or 9, 17, 653 etc.*

# Round to the Nearest 1,000

## Notes and Guidance

Children build on their knowledge of rounding to the nearest 10 and 100, to round to the nearest thousand for the first time.

Children must understand which multiples of 1,000 a number sits between.

When rounding to the nearest 1,000, children should look at the digits in the hundreds column.

## Mathematical Talk

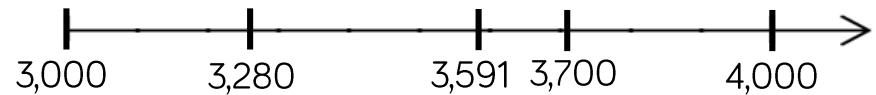
Which thousands numbers does \_\_\_\_\_ sit between?

How can the number line help you to see which numbers round up/down?

Which place value column do we need to look at when we round the nearest 1,000?

## Varied Fluency

- Say whether each number on the number line is closer to 3,000 or 4,000



Round 3,280, 3,591 and 3,700 to the nearest thousand.

- Round these numbers to the nearest 1,000
  - Eight thousand and fifty-six
  - 5 thousands, 5 hundreds, 5 tens and 5 ones
  - 
  - LXXXII

- Complete the table.

Start number	Rounded to the nearest 10	Rounded to the nearest 100	Rounded to the nearest 1,000
4,999			
LXXXII			


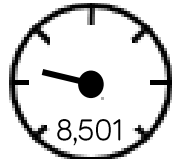
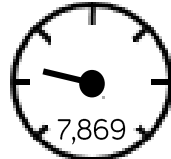


# Round to the Nearest 1,000

## Reasoning and Problem Solving

David's mum and dad are buying a car.

They look at the following cars:

<p>Car A</p>  <p>9,869</p> <p>Approximately 10,000 miles</p>	<p>Car B</p>  <p>8,501</p> <p>Approximately 8,000 miles</p>	<p>Car C</p>  <p>7,869</p> <p>Approximately 8,000 miles</p>
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Are all of the cars correctly advertised?

Explain your reasoning.

Car B is incorrectly advertised. It should be rounded up to 9,000

A number is rounded to the nearest thousand.

The answer is 7,000

What could the original number have been?

Give five possibilities.

What is the greatest number possible?

What is the smallest number possible?

Possible answers:

- 6,678
- 7,423
- 7,192
- 6,991

Greatest: 7,499  
Smallest: 6,500

# Round to 10, 100 and 1,000

## Notes and Guidance

Children build on their knowledge of rounding to 10, 100 and 1,000 from Year 4. They need to experience rounding up to and within 10,000

Children must understand that the column from the question and the column to the right of it are used e.g. when rounding 1,450 to the nearest hundred – look at the hundreds and tens columns. Number lines are a useful support.

## Mathematical Talk

Which place value column do we need to look at when we round to the nearest 1,000?

When is it best to round to the nearest 10? 100? 1,000?  
 Can you give an example of this?  
 Can you justify your reasoning?

Is there more than one solution?  
 Will the answers to the nearest 100 and 1,000 be the same or different for the different start numbers?

## Varied Fluency

Complete the table.

Start Number	Rounded to the nearest 10	Rounded to the nearest 100	Rounded to the nearest 1,000
DCCLXIX			

For each number, find five numbers that round to it when rounding to the nearest 100

300

10,000

8,900


Complete the table.

Start Number	Nearest 10	Nearest 100	Nearest 1,000
365			
1,242			
	4,770		

# Rounding to 10, 100 and 1,000

## Reasoning and Problem Solving

My number rounded to the nearest 10 is 1,150  
 Rounded to the nearest 100 it is 1,200  
 Rounded to the nearest 1,000 it is 1,000




Jack

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

What could Jack's number be?

Can you find all of the possibilities?

2,567 to the nearest 100 is 2,500




Whitney

Do you agree with Whitney?  
 Explain why.

---

Teddy



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

Explain the mistake Teddy has made.

I do not agree with Whitney because 2,567 rounded to the nearest 100 is 2,600. I know this because if the tens digit is 5, 6, 7, 8 or 9 we round up to the next hundred.

Teddy has correctly changed four thousand to five thousand but has added the tens and the ones back on. When rounding to the nearest thousand, the answer is always a multiple of 1,000

# Round within 100,000

## Notes and Guidance

Children continue to work on rounding, now using numbers up to 100,000

Children use their knowledge of multiples of 10, 100, 1,000 and 10,000 to work out which two numbers the number they are rounding sits between. A number line is a good way to visualise which multiple is the nearest. Children may need reminding of the convention of rounding up if numbers are exactly halfway.

## Mathematical Talk

Which place value column do we need to look at when we round to the nearest 1,000?


Why would we round these distances to the nearest 1,000 miles?


When is it best to round to 10? 100? 1,000?

Can you give an example of this?

Can you justify your reasoning?

## Varied Fluency

-  Round 85,617
  - To the nearest 10
  - To the nearest 100
  - To the nearest 1,000
  - To the nearest 10,000

-  Round the distances to the nearest 1,000 miles.

Destination	Miles from Manchester airport	Miles to the nearest 1,000
New York	3,334	
Sydney	10,562	
Hong Kong	5,979	
New Zealand	11,550	

-  Complete the table.

Rounded to the nearest 100	Start Number	Rounded to the nearest 1,000
	15,999	
	28,632	
	55,555	

## Round within 100,000

### Reasoning and Problem Solving

Round 59,996 to the nearest 1,000  
Round 59,996 to the nearest 10,000

What do you notice about the answers?

Can you think of three more numbers where the same thing could happen?

Both numbers round to 60,000

Other examples:

19,721 to the nearest 1,000 and 10,000

697 to the nearest 10 and 100

22,982 to the nearest 100 and 1,000

Two 5-digit numbers have a difference of five.

When they are both rounded to the nearest thousand, the difference is 1,000

What could the numbers be?

Two numbers with a difference of five where the last three digits are between 495 and 504

e.g. 52,498 and 52,503

## Round within a Million

### Notes and Guidance

Children use numbers with up to six digits, to recap previous rounding, and learn the new skill of rounding to the nearest 100,000

They look at cases when rounding a number for a purpose, including certain contexts where you round up when you wouldn't expect two e.g. to pack 53 items in boxes of 10 you would need 6 boxes.

### Mathematical Talk

How many digits does one million have?

Why are we rounding these populations to the nearest 100,000?

Can you partition the number \_\_\_\_\_ in different ways?

Which digits do you need to look at when rounding to the nearest 10? 100? 1,000? 10,000? 100,000?

How do you know which has the greatest value? Show me.

### Varied Fluency

Round these populations to the nearest 100,000

City	Population	Rounded to the nearest 100,000
Leeds	720,492	
Durham	87,559	
Sheffield	512,827	
Birmingham	992,000	

Round 450,985 to the nearest

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

At a festival, 218,712 people attend across the weekend. Tickets come in batches of 100,000

How many batches should the organisers buy?

## Round within a Million

### Reasoning and Problem Solving

The difference between two 3-digit numbers is two.

499 and 501  
498 and 500

When each number is rounded to the nearest 1,000 the difference between them is 1,000

What could the two numbers be?

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

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

A, B and C are not multiples of 10

What could A, B and C be?

A – B is between 650 to 749

B has to be greater than 400 to complete  
 $B - C = 400$

Possible answer:

A = 1,241  
B = 506  
C = 59

**White**

**Rose  
Maths**

**Block 1 - Place Value**

**Theme 6 – Negative numbers**



# Negative Numbers

## Notes and Guidance

Children recognise that there are numbers below zero. It is essential that this concept is linked to real life situations such as temperature, water depth etc.

Children should be able to count back through zero using correct mathematical language of “negative four” rather than “minus four” for example. This counting can be supported through the use of number squares, number lines or other visual aids.

## Mathematical Talk

What number is missing next to  $-5$ ? Can you count up to fill in the missing numbers?

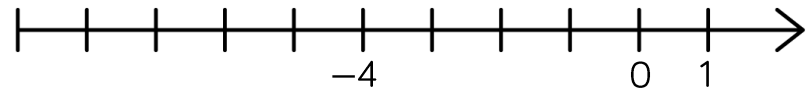
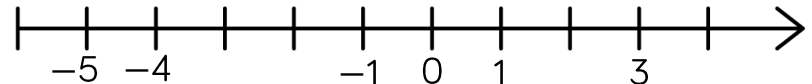
Can you use the words positive and negative in a sentence to describe numbers?

What do you notice about positive and negative numbers on the number line? Can you see any patterns?

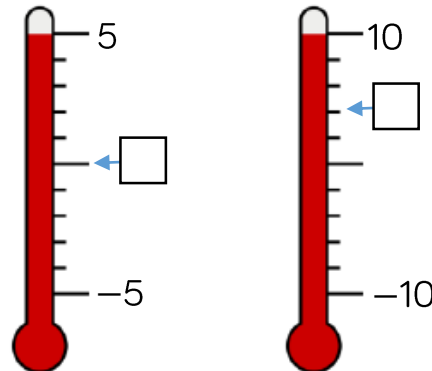
Is  $-1$  degrees warmer or colder than  $-4$  degrees?

## Varied Fluency

Complete the number lines



Fill in the missing temperatures on the thermometers.



Dexter is counting backwards out loud.

He says,

“Two, one, negative one, negative two, negative three ...”

What mistake has Dexter made?

# Negative Numbers

## Reasoning and Problem Solving

Can you spot the mistake in these number sequences?

a)  $2, 0, 0, -2, -4$

b)  $1, -2, -4, -6, -8$

c)  $5, 0, -5, -10, -20$

Explain how you found the mistake and convince me you are correct.

a) 0 is incorrect as it is written twice.

b) 1 is incorrect. The sequence has a difference of 2 each time, so the first number should be 2

c)  $-20$  is incorrect. The sequence is decreasing by 5, so the final number should be  $-15$

Teddy counted down in 3s until he reached  $-18$

He started at 21, what was the tenth number he said?

$-6$

Ensure the first number said is 21  
 $21, 18, 15, 12, 9, 6, 3, 0, -3, -6, \dots$

# Negative Numbers

## Notes and Guidance

Children continue to explore negative numbers and their position on a number line.

They need to see and use negative numbers in context, such as temperature, to be able to count back through zero. They may need to be reminded to call them negative numbers e.g. “negative four” rather than “minus four”.

## Mathematical Talk

Do we include zero when counting backwards?

Which is the coldest/warmest temperature?

How can we estimate where a number goes on this number line?

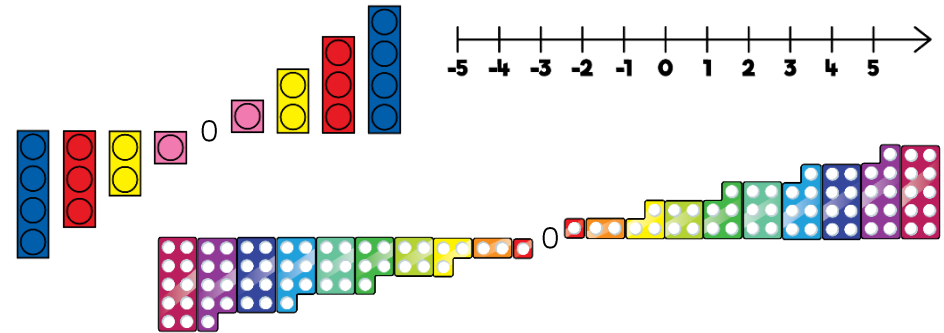
Does it help to estimate where zero goes first? Why?

What was the temperature increase/decrease?.

Can you show how you know the increase/decrease on a number line?

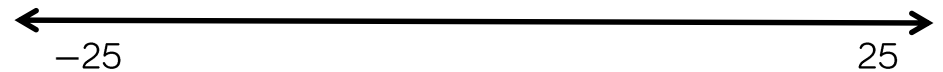
## Varied Fluency

Here are three representations for negative numbers.



What is the same and what is different about each representation?

Estimate and label where 0,  $-12$  and  $-20$  will be on the number line.



Whitney visits a zoo.  
The rainforest room has a temperature of  $32^{\circ}\text{C}$   
The Arctic room has a temperature of  $-24^{\circ}\text{C}$   
Show the difference in room temperatures on a number line.

# Negative Numbers

## Reasoning and Problem Solving

### True or False?

- The temperature outside is  $-5$  degrees, the temperature inside is 25 degrees.  
The difference is 20 degrees.
- Four less than negative six is negative two.
- 15 more than  $-2$  is 13

Explain how you know each statement is true or false.

False: the difference is 30 degrees because it is 5 degrees from  $-5$  to 0. Added to 25 totals 30.

False: it is negative 10 because the steps are going further away from zero.

True

Children may use concrete or pictorial resources to explain.

Put these statements in order so that the answers are from smallest to greatest.

- The difference between  $-24$  and  $-76$  52
- The even number that is less than  $-18$  but greater than  $-22$   $-20$
- The number that is half way between 40 and  $-50$   $-5$
- The difference between  $-6$  and 7 13

Ordered:  
 $-20, -5, 13, 52$