Autumn Scheme of Learning

Year 5

#MathsEveryoneCan

2020-21

White Rose Maths

New for 2020/21

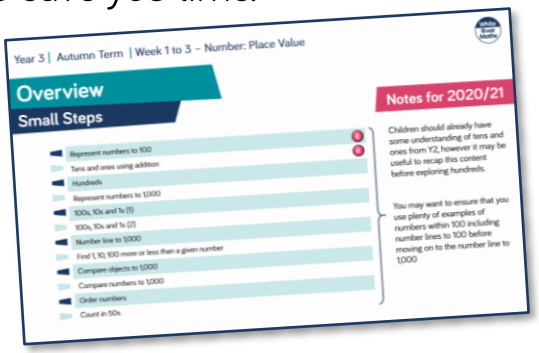
2020 will go down in history. The world has changed for all of us.

We want to do as much as we can to support children, teachers, parents and carers in these very uncertain times.

We have amended our schemes for 2020/21 to:

- ★ highlight key teaching points
- ★ recap essential content that children may have forgotten
- ★ flag any content that you might not have covered during the school closures period.

We hope these changes will add further value to the schemes and save you time.



Lesson-by-lesson overviews

We've always been reluctant to produce lesson-by-lesson overviews as every class is individual and has different needs. However, many of you have said that if blended learning becomes a key feature of school life next year, a weekly plan with linked content and videos could be really useful.

As always, we've listened! We've now produced a complete lesson-by-lesson overview for Y1 to Y9 that schools can use or adapt as they choose. Each lesson will be linked to a free-to-use home learning video, and for premium subscribers, a worksheet. This means that you can easily assign work to your class, whether they are working at home or in school.

Inevitably, this lesson-by-lesson structure won't suit everyone, but if it works for you, then please do make use of this resource as much as you wish.

Teaching for Mastery

These overviews are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the new National Curriculum.

The overviews:

- have number at their heart. A large proportion of time is spent reinforcing number to build competency
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of opportunities to build reasoning and problem solving elements into the curriculum.

For more guidance on teaching for mastery, visit the NCETM website:

https://www.ncetm.org.uk/resources/47230

Concrete - Pictorial - Abstract

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

Need some CPD to develop this approach? Visit www.whiterosemaths.com for find a course right for you.

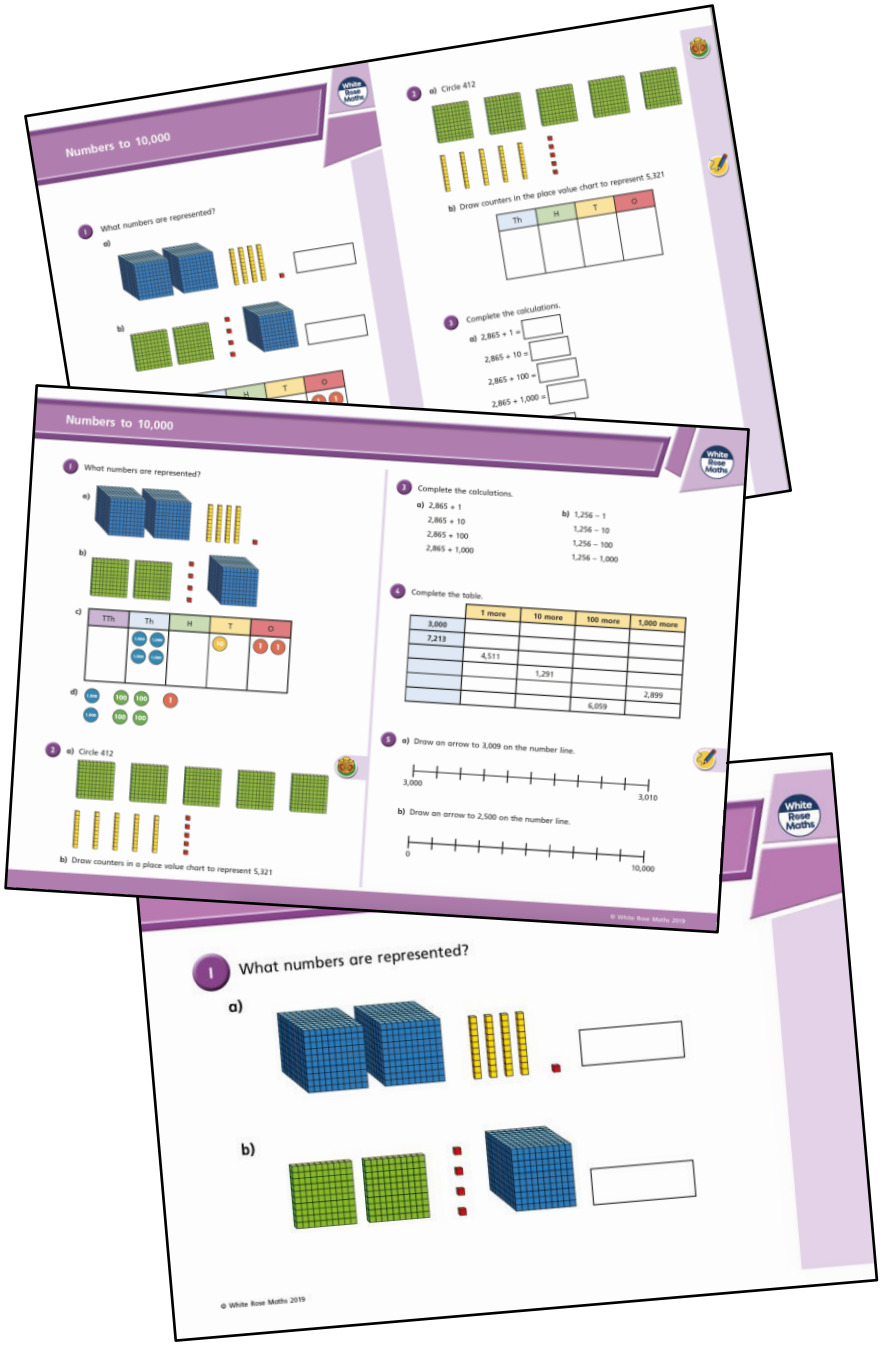
Supporting resources

We have produced supporting resources for every small step from Year 1 to Year 11.

The worksheets are provided in three different formats:

- Write on worksheet – ideal for children to use the ready made models, images and stem sentences.
- Display version – great for schools who want to cut down on photocopying.
- PowerPoint version – one question per slide. Perfect for whole class teaching or mixing questions to make your own bespoke lesson.

For more information visit our online training and resources centre resources.whiterosemaths.com or email us directly at support@whiterosemaths.com



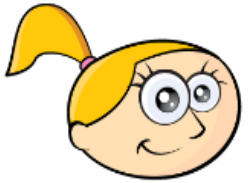
Meet the Characters

Children love to learn with characters and our team within the scheme will be sure to get them talking and reasoning about mathematical concepts and ideas. Who's your favourite?


Teddy


Rosie


Mo


Eva


Alex


Jack


Whitney


Amir


Dora


Tommy


Dexter


Ron


Annie

	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		Statistics		Number: Multiplication and Division			Measurement: Perimeter and Area	
Spring	Number: Multiplication and Division			Number: Fractions						Number: Decimals and Percentages		Consolidation
Summer	Consolidation	Number: Decimals			Geometry: Properties of Shape			Geometry: Position and Direction		Measurement: Converting Units		Measurement: Volume

White Rose Maths

Autumn - Block 1

Place Value

Overview

Small Steps

- 1000s, 100s, 10s and 1s (R)
- Numbers to 10,000
- Rounding to the nearest 10 (R)
- Rounding to the nearest 100 (R)
- Round to nearest 10, 100 and 1,000
- Numbers to 100,000
- Compare and order numbers to 100,000
- Round numbers within 100,000
- Numbers to a million
- Counting in 10s, 100s, 1,000s, 10,000s, and 100,000s
- Compare and order numbers to one million
- Round numbers to one million
- Negative numbers
- Roman Numerals to 1,000

Notes for 2020/21

Before exploring numbers to 10,000 ensure that children are secure with 1000s, 100s, 10 and 1s.

You may also find it useful to recap rounding to the nearest 10 and 100 separately before expecting children to round to either 10, 100 and 1,000

Work on Roman Numerals has been moved to the end of the block as we believe it is important for children to be secure with our own number system before exploring another.

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?

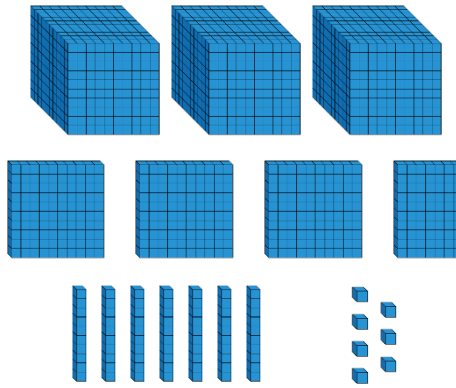
How do you know you have formed the number correctly? What could you use to help you?

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

Varied Fluency

R

Complete the sentences.

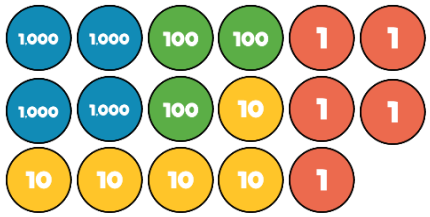


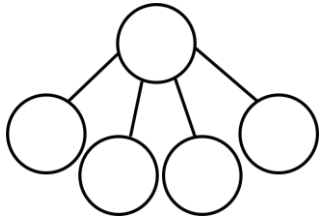
There are _____ thousands, _____ hundreds, _____ tens and _____ ones.

The number is _____ .

___ + ___ + ___ + ___ = ___

Complete the part-whole model for the number represented.





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

6,9<u>8</u>3	<u>9</u>,021	<u>7</u>89	6,57<u>0</u>

Represent each of the numbers on a place value grid.

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

Reasoning and Problem Solving

R

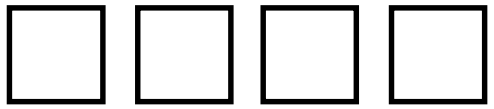
Create four 4-digit numbers to fit the following rules:

- 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

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?

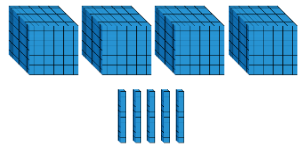
Which representation is the odd one out? Explain your reasoning.

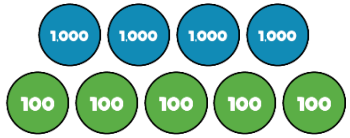
What number could the arrow be pointing to?

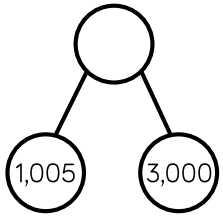
Which column(s) change when adding 10, 100, 1,000 to 2,506?

Varied Fluency

Match the diagram to the number.

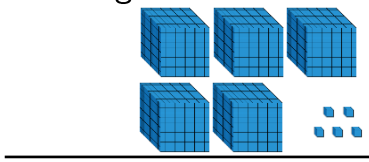


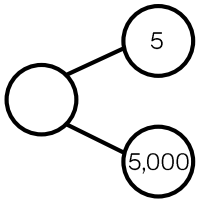


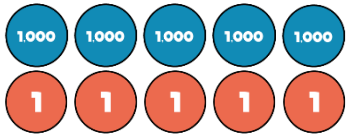


4,005 | 4,500 | 4,050

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.

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?

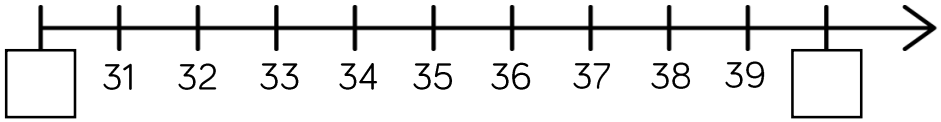
Which column do we look at when rounding to the nearest 10? What do we do if the number in that column is a 5?

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

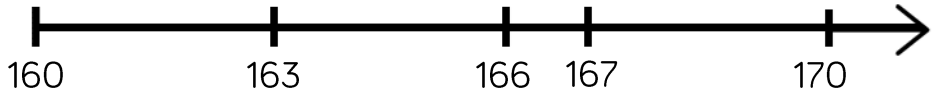
Varied Fluency

R

- Which multiples of 10 do the numbers sit between?

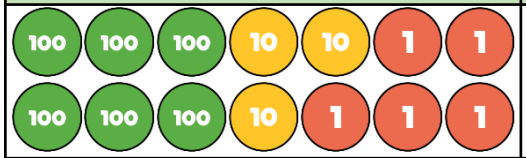


- Say whether each number on the number line is closer to 160 or 170?



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

R

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?

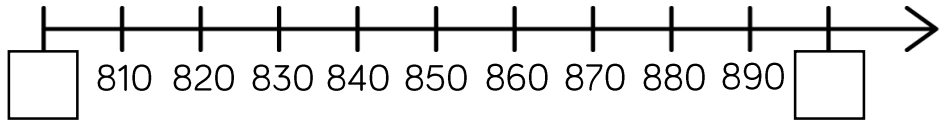
What would 49 round to, to the nearest 100?

Can the answer be 0 when rounding?

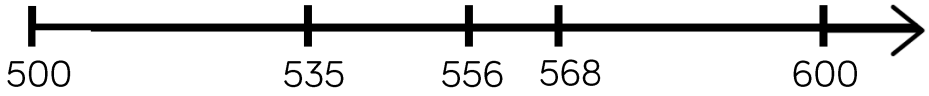
Varied Fluency

R

- 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
400 + 50 + 7	
994	
XLV	

Round to the Nearest 100

Reasoning and Problem Solving

R

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?

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

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

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 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

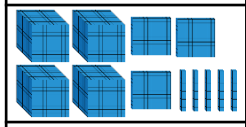
Which place value column do we need to look at when we round to the nearest 1,000?

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

What could Jack's number be?

Can you find all of the possibilities?

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

2,567 to the nearest 100 is 2,500

Whitney

Do you agree with Whitney?
Explain why.

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

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

Explain the mistake Teddy has made.

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

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

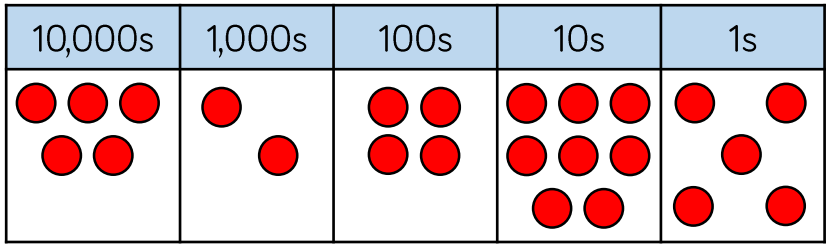
Using a number line, they find numbers between two points, place a number and estimate where larger numbers will be.

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.

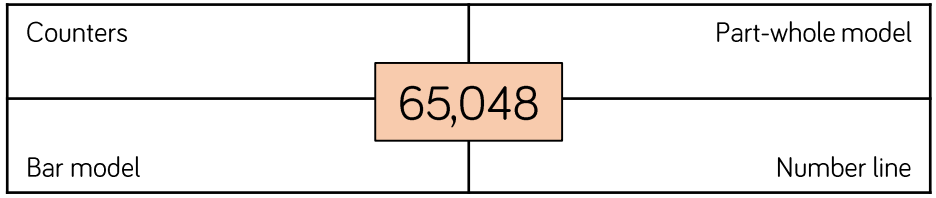


Write the number in figures and in words.

- 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.



Complete the missing numbers.

59,000 = 50,000 + _____

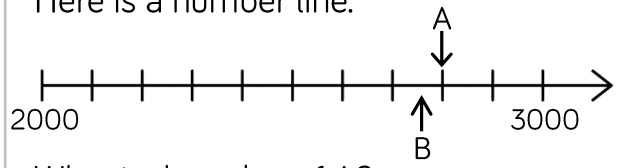
_____ = 30,000 + 1,700 + 230

75,480 = _____ + 300 + _____

Numbers to 100,000

Reasoning and Problem Solving

Here is a number line.



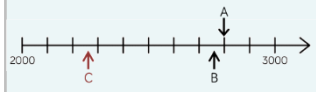
What is the value of A?

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

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?

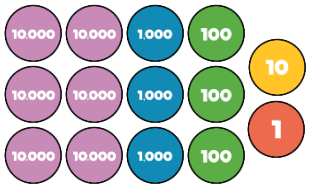
What is the value of _____ in this number?

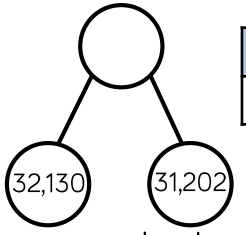
What is the value of the whole? Can you suggest other parts that make the whole?

What number does MMXVII represent?

Varied Fluency

- Put these numbers in ascending order.



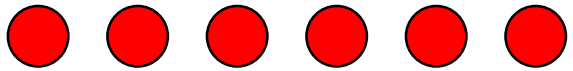


10,000s	1,000s	100s	10s	1s
6	3	3	2	0

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

MMXVII ○

- 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 digits 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

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

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?

Varied Fluency

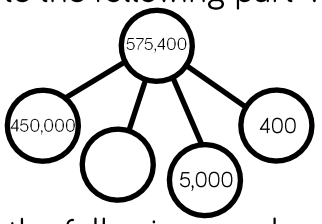
Thousands			Ones		
H	T	O	H	T	O

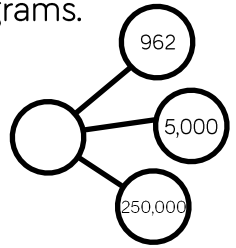
Use counters to make these numbers on the place value chart.

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.

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

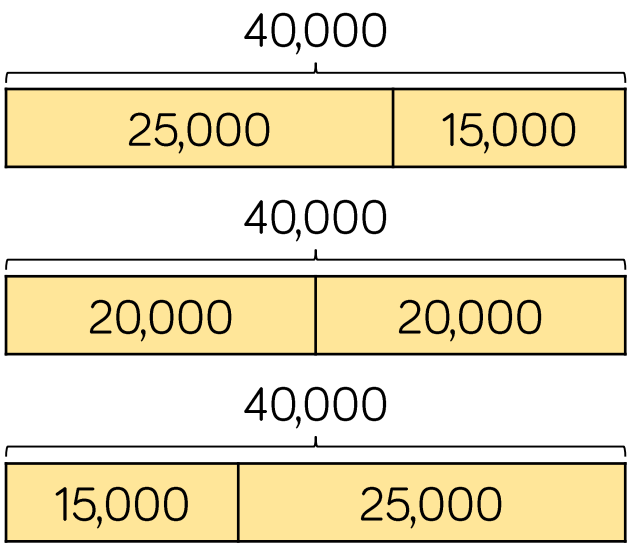
25,571

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.

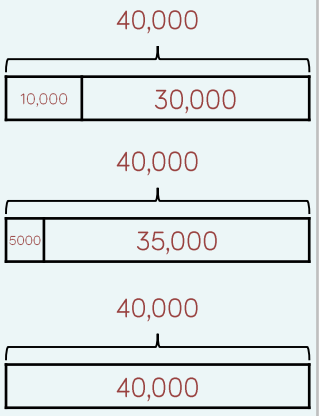
25,571: the value is 7 tens. It is one column to the left of the ones column.

The bar models are showing a pattern.



Draw the next three.

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



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

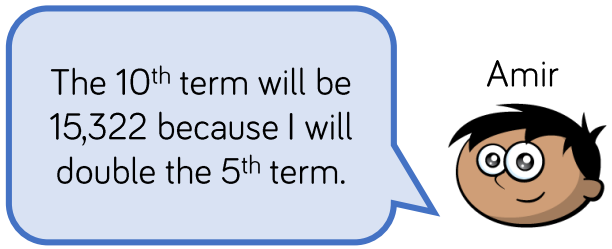
Give children a target number to make then let them choose a card. Children then need to adjust their number on the chart.

Counting in Powers of 10

Reasoning and Problem Solving

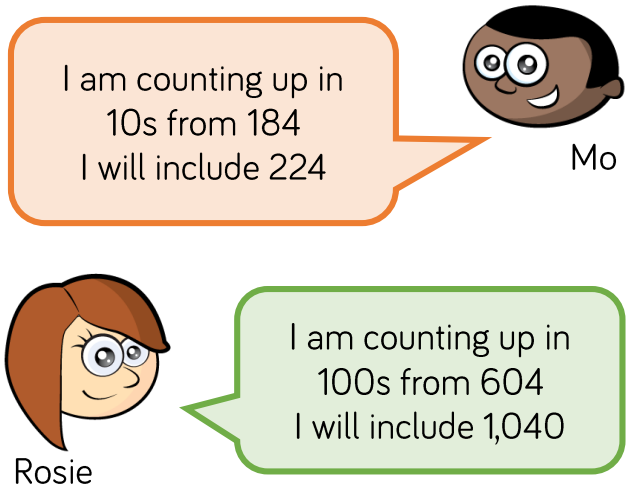
Amir writes the first five numbers of a sequence.

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



Is he correct?
Explain why.

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



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

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.

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?

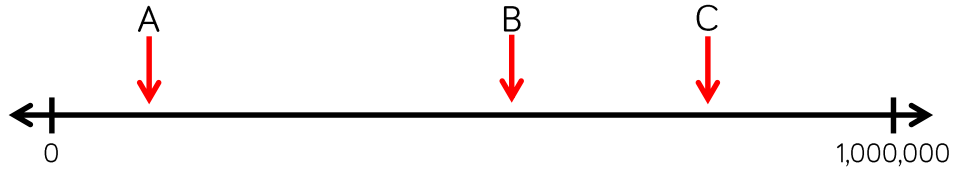
What is the value of the whole? Can you suggest other parts that make the whole?
Can you write a story to support your part-whole model?

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

475,000	?	407,500
Greatest		Smallest

What could the number be?

Can you find three possibilities?

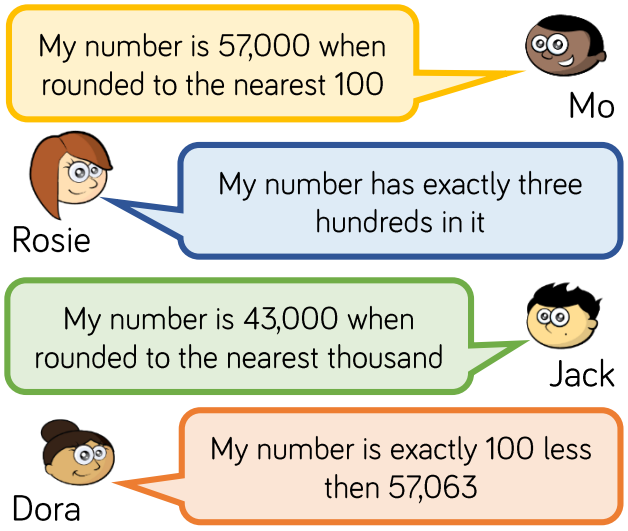
Possible answers include:

444,812
435,812
439,502

Here are four number cards.

42,350	43,385
56,995	56,963

Four children take one each and say a clue.



Which card did each child have?

Mo: 56,995
Rosie: 42,350
Jack: 43,385
Dora: 56,963

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.

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

What could the two numbers be?

499 and 501
498 and 500

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

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

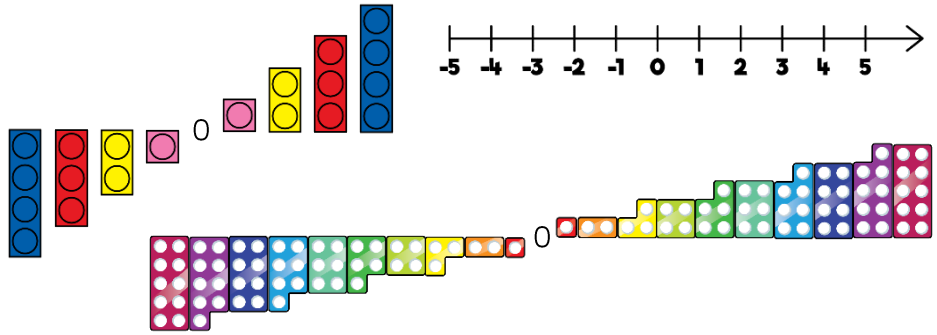
Do we include zero when counting backwards?

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°C
The Arctic room has a temperature of −24°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
- The even number that is less than −18 but greater than −22
- The number that is half way between 40 and −50
- The difference between −6 and 7

52

−20

−5

13

Ordered:
−20, −5, 13, 52

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?

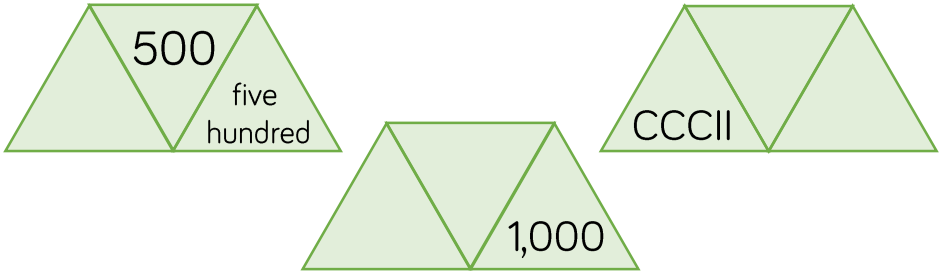
How can you check you have represented the Roman Numeral correctly?

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

Varied Fluency

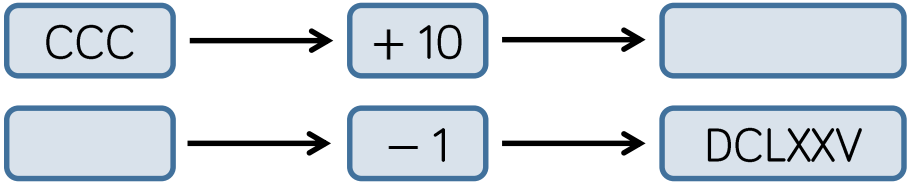
- Lollipop stick activity.
  The teacher shouts out a number and the children make it with lollipop sticks.
  Children could also do this in pairs or groups, or for a bit of fun they could test the teacher!

- 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

CCCL + 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