

White

**Rose
Maths**

Autumn - Block 1

Place Value

Overview

Small Steps

NC Objectives

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

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

Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones).

Order and compare numbers beyond 1,000.

Identify, represent and estimate numbers using different representations.

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

Solve number and practical problems that involve all of the above and with increasingly large positive numbers.

Count backwards through zero to include negative numbers.

Roman Numerals to 100

Round to the nearest 10

Round to the nearest 100

Count in 1,000s

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

Partitioning

Number line to 10,000

1,000 more or less

Compare numbers

Order numbers

Round to the nearest 1,000

Count in 25s

Negative numbers

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?

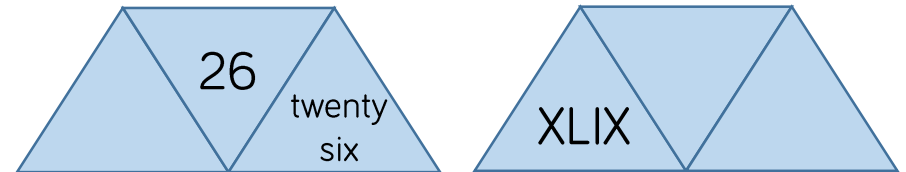
Can you spot any patterns? If 20 is XX what might 200 be?

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

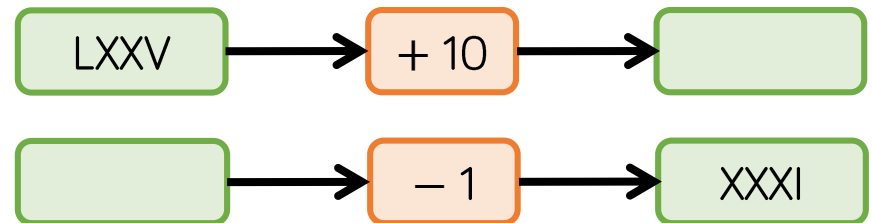
-  Lollipop stick activity.
The teacher shouts out a number and the children make it with lollipop sticks.
Children could also do this in pairs or groups, and for a bit of fun they could test the teacher!

-  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.

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?

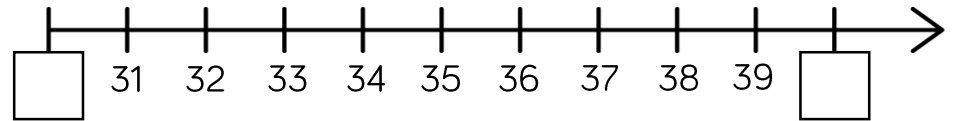
Which column do we look at when rounding to the nearest 10?

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

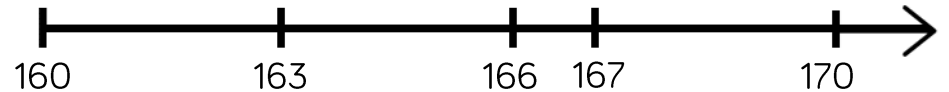
Which number is being represented? Will we round it up or not? Why?

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														
<table border="1"> <tr> <td>100</td><td>100</td><td>100</td><td>10</td><td>10</td><td>1</td><td>1</td> </tr> <tr> <td>100</td><td>100</td><td>100</td><td>10</td><td>1</td><td>1</td><td>1</td> </tr> </table>	100	100	100	10	10	1	1	100	100	100	10	1	1	1	
100	100	100	10	10	1	1									
100	100	100	10	1	1	1									
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?

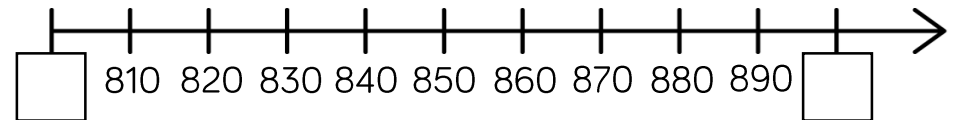
Why do numbers up to 49 round down to the nearest 100 and numbers 50 to 99 round up?

What would 49 round to, to the nearest 100?

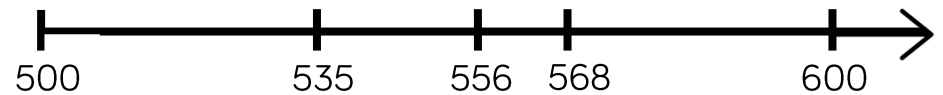
Can the answer be 0 when rounding?

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.

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

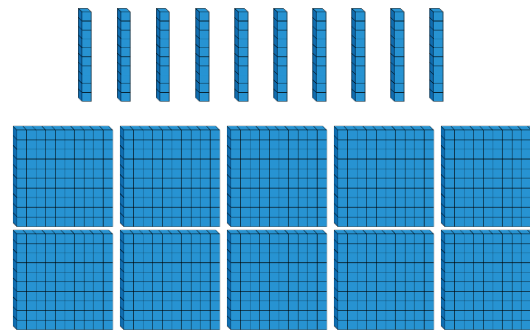
How many hundreds are there in one thousand?
How many hundreds make ____ thousands?

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.



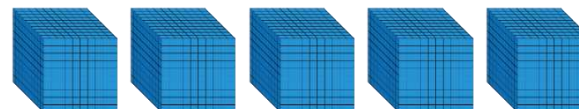
How many sweets are there altogether?



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

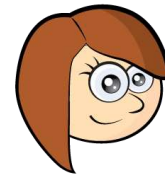
- When counting in hundreds, the ones digit changes.
- The thousands column changes every time you count in thousands.
- To count in thousands, we use 4-digit numbers.

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.

1,000s, 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

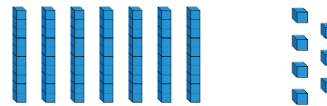
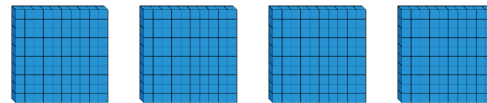
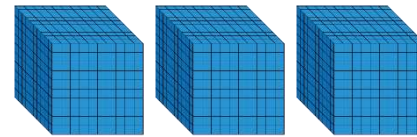
Can you represent the number on a place value grid?
How many thousands/hundreds/tens/ones are there?

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.

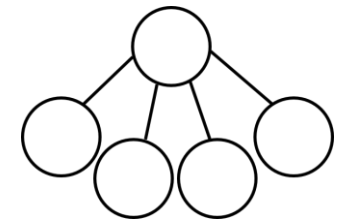
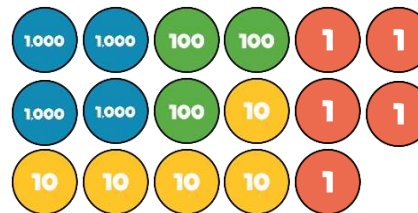


There are _____ thousands,
_____ hundreds, _____
tens and _____ ones.

The number is _____.

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

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

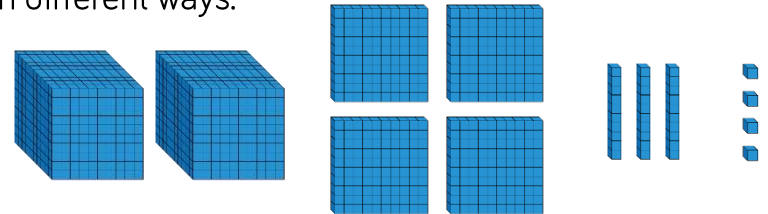
What number is being represented?

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.

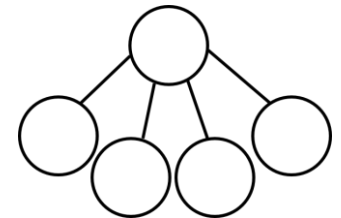
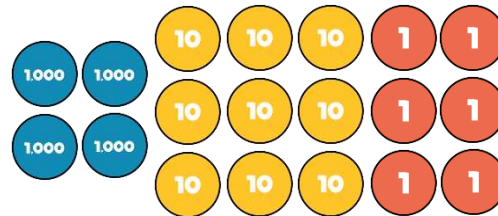


$$2000 + 400 + \boxed{} + 4$$

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

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

- 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:



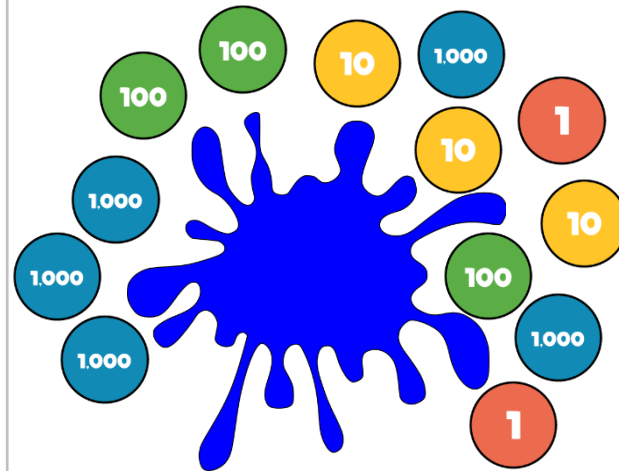
Who has the largest number?
Explain.

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?

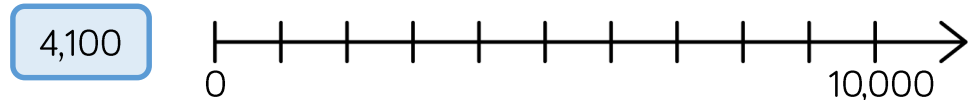
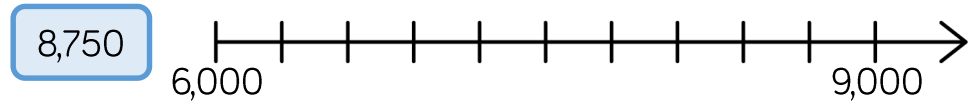
When estimating where a number should be placed, on a number line, what can help you?

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

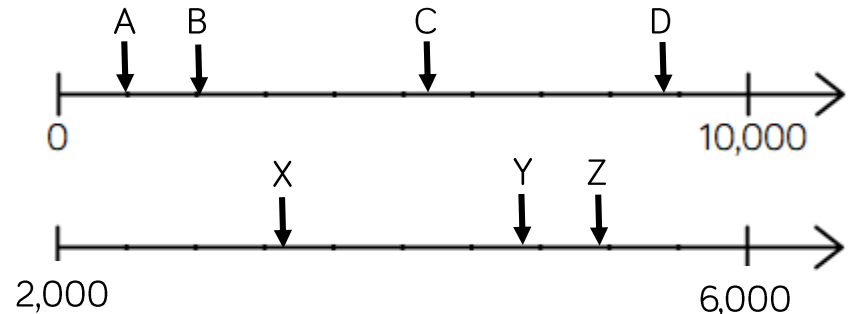
When a number line has no values at the end, what strategies could you use to help you figure out the missing value? Could there be more than one answer?

Varied Fluency

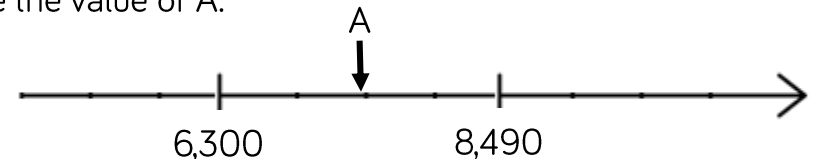
- Draw arrows to show where the numbers would be on the number line.



- Estimate the value of each letter.



- Estimate the value of A.



Number Line to 10,000

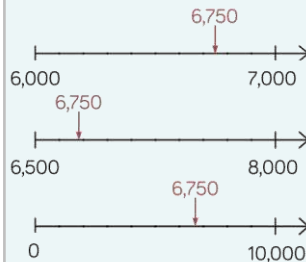
Reasoning and Problem Solving

Place 6,750 on each of the number lines.

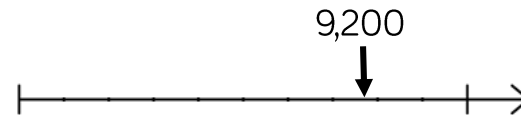


Are they in the same place on each line? Why?

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

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

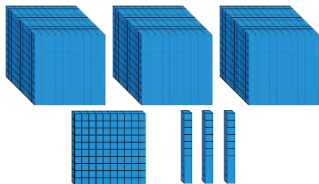
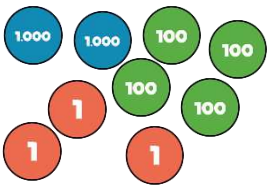
Fill in the missing values.

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

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

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

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

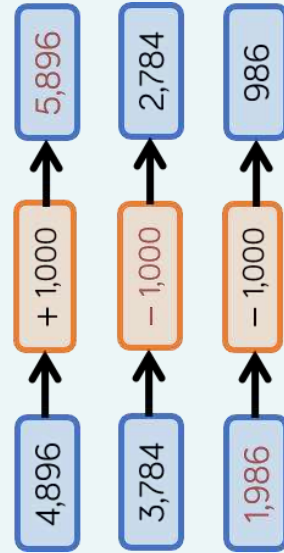
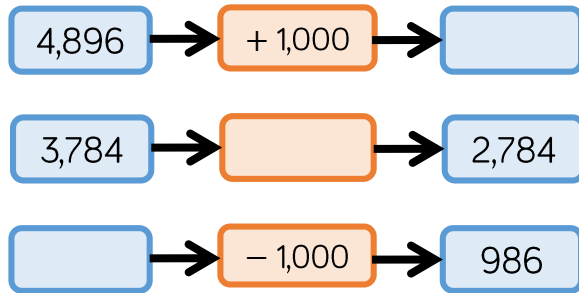
8,999

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?

Can you write your own problem similar to this?

6,310

Jack says:

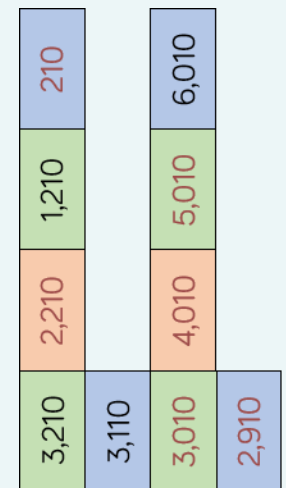
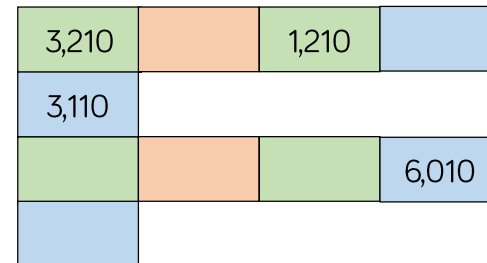


When I add 1,000 to 4,325, I only have to change 1 digit.

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:



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?

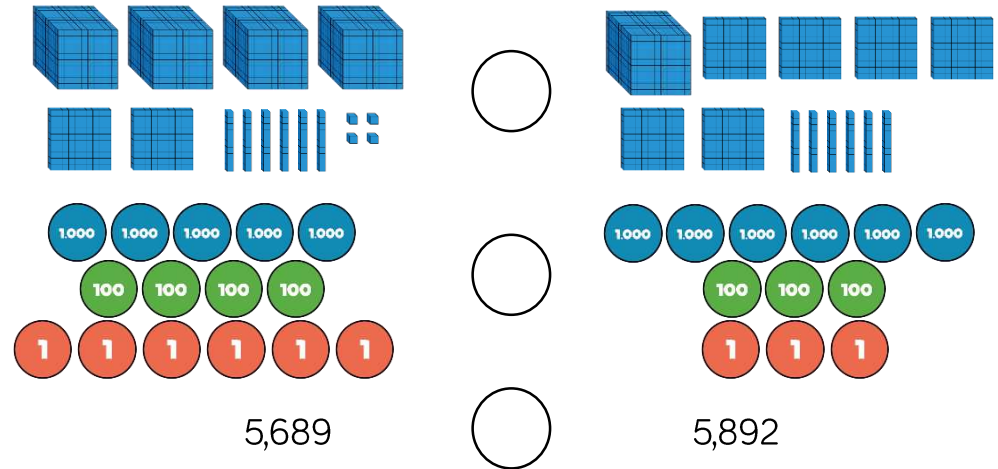
Which column do you start comparing from? Why?

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 $=$



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

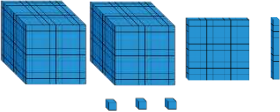
Which number is the greatest? Which number is smallest?
How do you know?

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 $=$

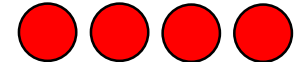
2,764  XXVII

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

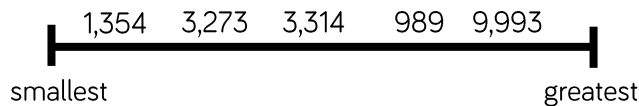
Reasoning and Problem Solving

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

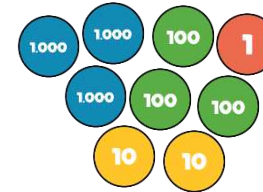
3,593

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



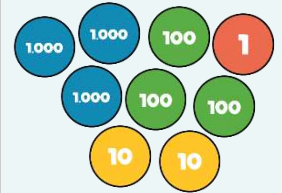
Put one number in each box so that the list of numbers is ordered smallest to largest.

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?

LXXXVI

Half of 2,400



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

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

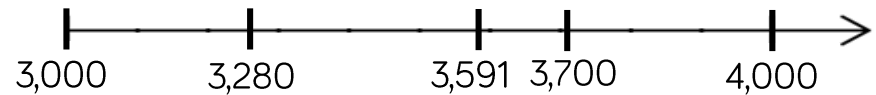
Which thousands numbers does _____ sit between?

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.

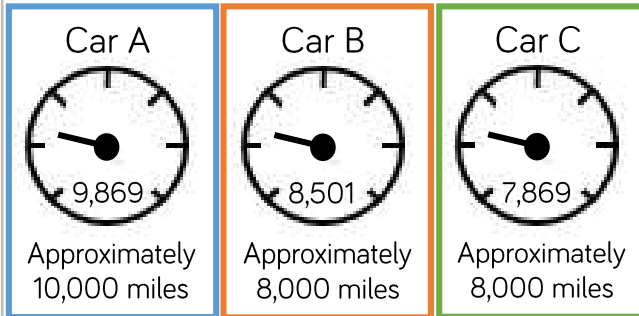
Start number	Rounded to the nearest 10	Rounded to the nearest 100	Rounded to the nearest 1,000
			
4,999			
LXXXII			

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:



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

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.

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

Explain your answer.

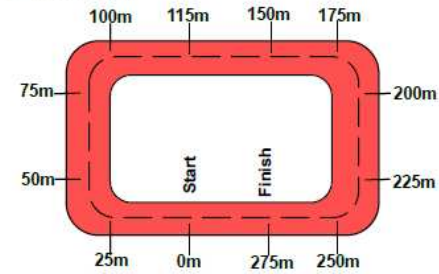
I don't agree. Multiples of 1,000 are multiples of 25 because 25 goes into 1,000 exactly, but not all multiples of 25 are multiples of 1,000 e.g. 1,075

No, he will not say 725 because:

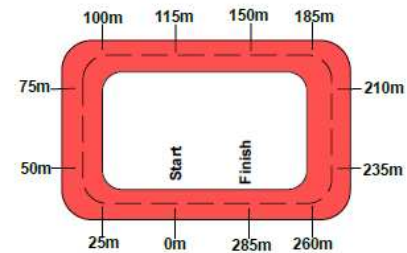
790, 765, 740, 715, 690, 665, ...

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.

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?

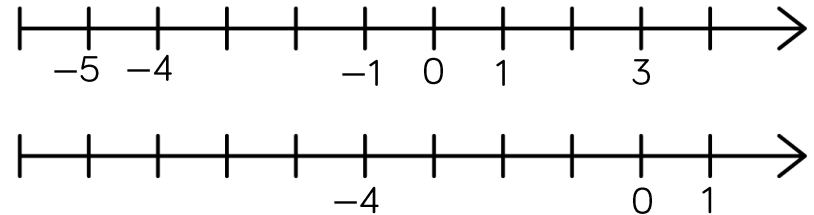
Can you use the words positive and negative in a sentence to describe numbers?

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

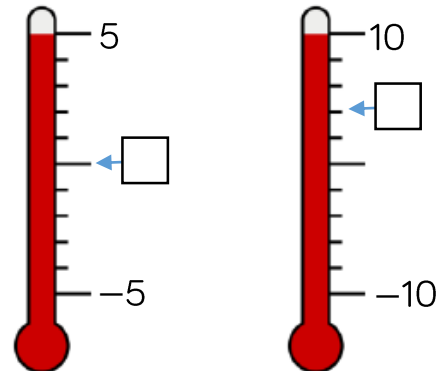
Is -1 degrees warmer or colder than -4 degrees?

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
 $21, 18, 15, 12, 9, 6, 3, 0, -3, -6, \dots$