

White Rose Maths Hub
Small steps guidance and examples

Year 4

Block 1 – Place Value

Overview

Small Steps

- 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

NC Objectives

Count in multiples of 6, 7, 9, 25 and 1000.

Find 1000 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 1000

Identify, represent and estimate numbers using different representations.

Round any number to the nearest 10, 100 or 1000

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

Notes and Guidance

Building on their Y3 knowledge of numerals to 12 on a clock face, children explore Roman Numerals to 100.

They explore what is the same and what is different between the number systems, for example there is no zero.

Mathematical Talk

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

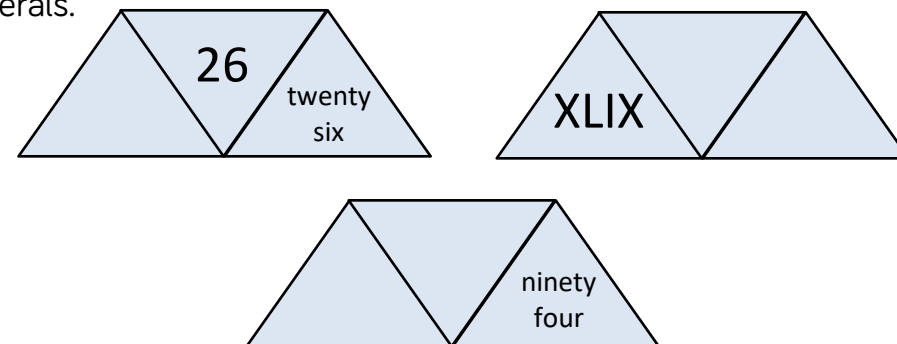
Do you notice any patterns? If 20 is XX what might 200 be?

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

Varied Fluency

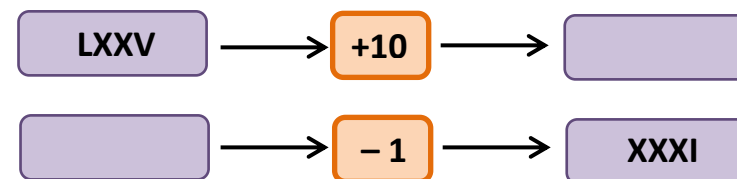
- 1 Lollipop stick activity.
The teacher shouts out a number and the children make it with lollipop sticks.
Children could also do this in pairs or groups, and for a bit of fun they could test the teacher!

- 2 Each diagram shows a number in numerals, words and roman numerals.



Complete the diagrams.

- 3 Complete the function machines.



Roman Numerals

Reasoning and Problem Solving

Solve the following calculation:

$$XIV + XXXVI = \boxed{}$$

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

$$C \div II = L$$
$$L \div I = L$$

$$X \times V = L$$
$$XXV \times II = L$$

$$LXV - XV = L$$
$$C - L = L$$

$$XX + XX + X = L$$

Bobby 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 Bobby is correct

Bobby is incorrect. A lot of multiples of 10 have an X in them but the X can mean different things.

For example X in 10 just means one ten but X in 40 (XL) means 10 less than 50

X in 60 (LX) means 10 more than 50

The numbers 50 has no X and neither does 100

Round to the nearest 10

Notes and Guidance

Starting with 2 digit numbers, children look at the position of a number on a number line. They then apply their understanding to three digit numbers, focusing on the number of ones rounding up or down.

Highlight the importance of five here and the idea that although it is in the middle of the two numbers it always rounds up.

Mathematical Talk

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

What is a multiple of 10? Which multiples of 10 does this number sit between?

Which number is being represented? Will we round it up or down? Why?

Varied Fluency

- 1 Which multiples of 10 do the numbers sit between?



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



Round 163, 166 and 167 to the nearest 10

- 3 Complete the table.

Start number	Rounded to the nearest 10
851	
XCVIII	

Round to nearest 10

Reasoning and Problem Solving

A number is rounded to 370
What could all the possibilities be?

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 2 numbers is 79

What could the two numbers be?

Is there more than one possibility?

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

Jasmine says:



847 to the
nearest 10 is
840.

Do you agree with Jasmine?

Explain why.

I don't agree with
Jasmine 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

Building on the previous step, 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, and understanding of which hundreds a number sits between, to help them round.

Mathematical Talk

How is rounding to the nearest 100 similar and different to the nearest 10?

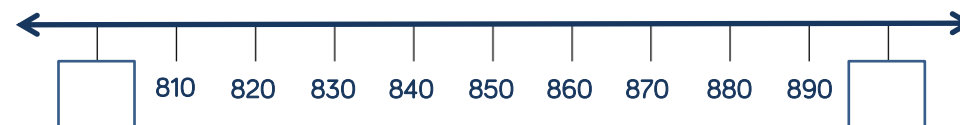
Which column do we need to look at when rounding to the nearest 100?

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

When rounding to 10 our number has one zero and when rounding to 100 it has two zeros. Why?

Varied Fluency

- 1 Which multiples of 100 do the numbers sit between?



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



Round 537, 555 and 568 to the nearest 100

- 3 Complete the table.

Start number	Rounded to the nearest 10
400 50 7	
994	
XLV	

Round to the Nearest 100

Reasoning and Problem Solving

Are the statements always, sometimes or never true?

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 a five in the tens column will be 50 or above so will always round up.

Sometimes- a number with a five in the ones column might have 0-4 in the tens column and round down or might have 5-9 in the tens column and round up.

Sometimes- a number with a five in the hundreds column might have 0-4 in the tens column and round down or might have 5-9 in the tens column and round up.

When a number is rounded to the nearest 100 it is 200

When the same number is rounded to the nearest 10 it is 250

What could the number be?

249 because when rounded to the nearest 10 it round to 250 and when rounded to the nearest 100 it rounds to 200

Other numbers include: 248, 247, 246, 245

Using the digit cards 0-9, can you make 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 1000

To 20 it could be: 15-24

To 10 it could be: 5-14

To 500 it could be 650-749

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

Count in 1,000s

Notes and Guidance

Looking at four digit numbers for the first time, children explore what a thousand is through concrete and pictorial representations.

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

Mathematical Talk

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

When counting in thousands, which digit changes?

Varied Fluency

- 1 How many sweets are there altogether?



There are three jars of sweets.

There are sweets altogether.

- 2 What numbers are represented below?



Write them in numerals and words.

- 3 Complete the number tracks.

3,000	4,000		6,000			9,000	
	9,000		7,000			4,000	

Count in 1000s

Reasoning and Problem Solving

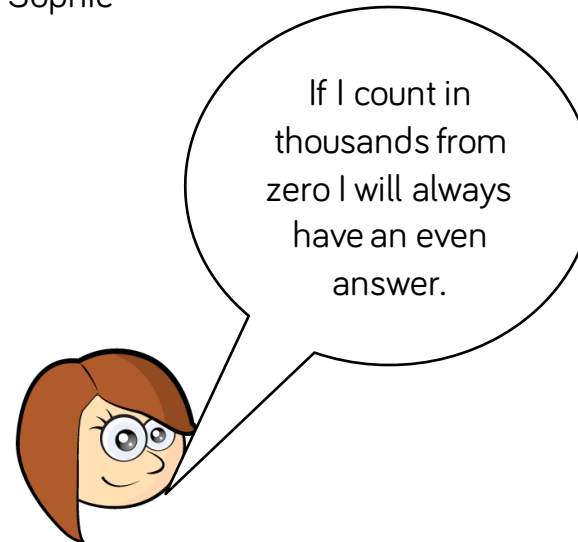
Sort these statements into **sometimes**, **always**, **never**.

- 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.

When counting in hundreds, the ones digit changes. **NEVER**
The thousands column changes every time you count in thousands. **ALWAYS**
To count in thousands, we use 4 digit numbers. **SOMETIMES**

True or false?

Sophie



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

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

Notes and Guidance

Children represent numbers to 9,999 on a place value grid and understand that a 4 digit number is made up of 1,000s, 100s, 10s and 1s.

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

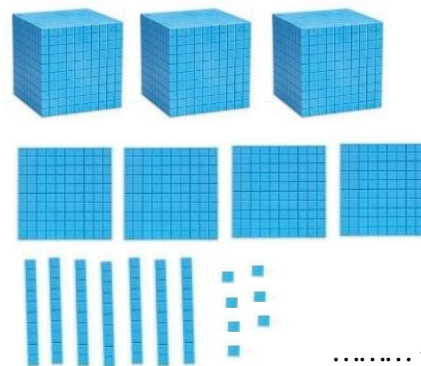
Mathematical Talk

How is the value of zero represented within a number?

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

Varied Fluency

1 Complete the sentences.

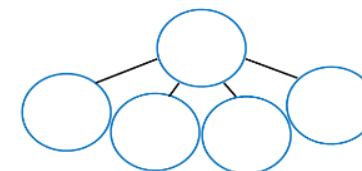
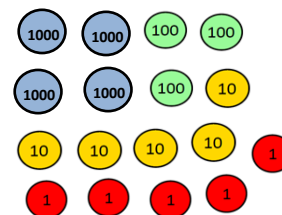


There are thousands,
..... hundreds, tens
and ones.

The number is

..... + + + =

2 Complete the part-whole model for the number represented.



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

6,983

9,021

789

6,570

1000s, 100s, 10s and 1s

Reasoning and Problem Solving

Create 5 four digit numbers where the tens number is 3 and the digits add up to 12

3,333
4,431
6,132
2,730
5,232

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.

The whole number has a digit total of 21

4,098

Partitioning

Notes and Guidance

This small step builds on basic partitioning. Children will explore how numbers can be broken apart in more than one way.

This step is particularly important later on, when children begin to exchange. Understanding that $5000 + 300 + 20 + 9$ is equal to $4000 + 1300 + 10 + 19$ is crucial, and this small step enables children to explore this explicitly.

Mathematical Talk

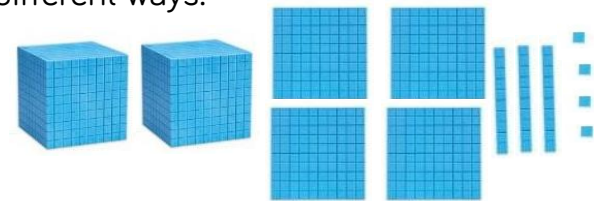
What number is being shown?

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

If you know ten 100s are equal to 1000 and ten 10s are equal to 100, how can you use this to make different exchanges?

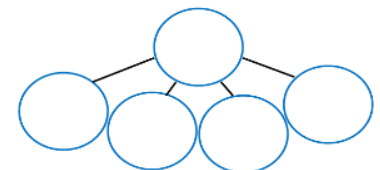
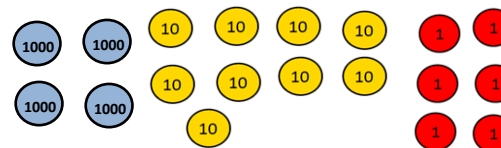
Varied Fluency

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



$$\begin{array}{rclcl} 2000 & + & 400 & + & \boxed{} & + & 4 \\ 1000 & + & \boxed{} & + & \boxed{} & + & 14 \\ 1000 & + & 1300 & + & \boxed{} & + & \boxed{} \end{array}$$

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



- 3 Lily describes a number. She says,
“My number has 4 thousands and 301 ones”

What is Lily's number?

Can you describe it 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 3500, it make 350

Jeff says:



My number has five
thousands, three
hundreds and 64
ones

John says:



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

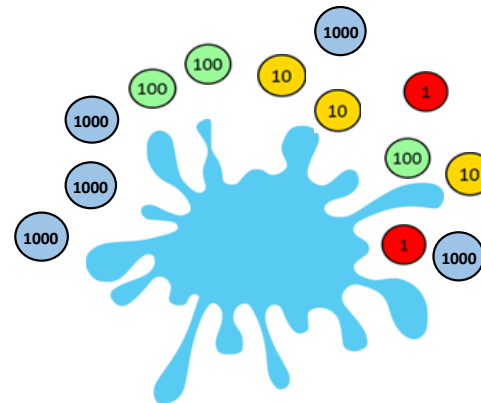
They both have the same number because 53 hundreds is equal to 5 thousand and 3 hundred. Jeff and John both have 5364

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.



Could be one 1,000
counter and one 100
counter.
Could be ten 100
counters and ten 10
counters.
Could be eleven 100
counters.

Number Line to 10,000

Notes and Guidance

This step focuses only on the number line. Children are expected to estimate, work out and draw numbers on a number line to 10,000.

Discuss being able to count in steps from both sides.

Number lines can 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?

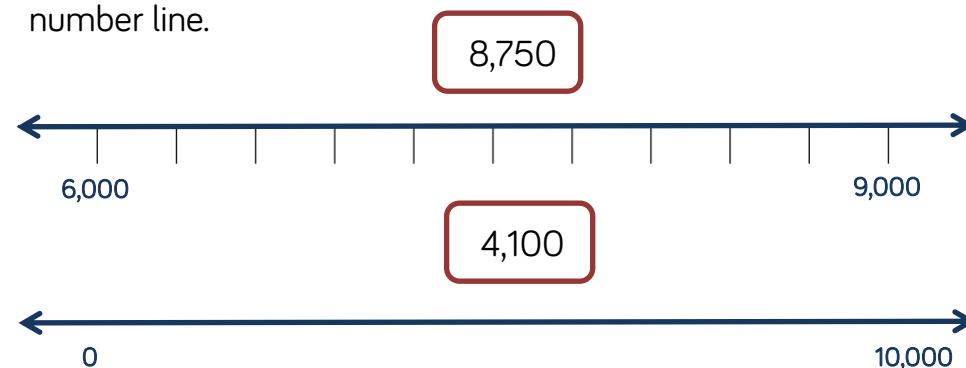
When estimating where a number should be placed, what facts can help you?

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

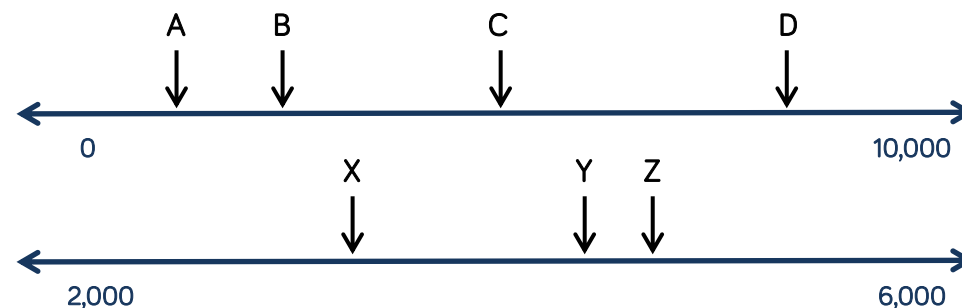
When a number line has no values at the end, what strategies could you use to help you figure out the missing value? Could there be more than one answer?

Varied Fluency

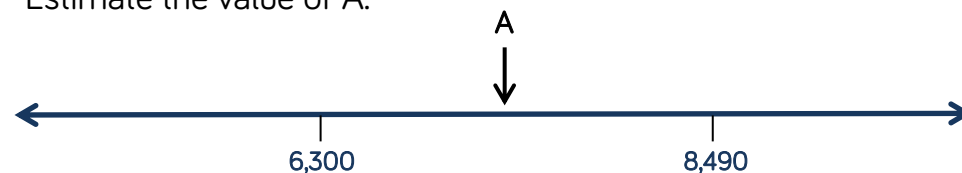
- 1 Draw arrows to show where the numbers would be on the number line.



- 2 Estimate the value of each letter.



- 3 Estimate the value of A.



Number Line to 10,000

Reasoning and Problem Solving

Place 6,750 on each of the number lines

6,000 7,000



6,500 8,000



0 10,000



Are they in the same place? Why?

No

Each line has different numbers at the start and end so the position of 6,750 changes.

Line 1: 6,500 at half way so 6,720 is past the mid- point

Line 2: 7,250 at half way so 6,750 is before the mid-point.

Line 3: 5,000 in the middle, so 6,750 is past the mid-point.

If the number on the line is 9,200, what could the start and end numbers be?

Find three different ways.



Possible answers:

8,400 – 9,500

5,000 – 10,000

9,120 – 9,220

1,000 more or less

Notes and Guidance

Building on Year 3 where they explored finding 1, 10 and 100 more or less, children now move onto 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 numerals or Base 10

Mathematical Talk

What is 1,000 more than/less than a number? Which column changes?

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 1000 more than ____ is ____ because..... I can prove this by_____.

Varied Fluency

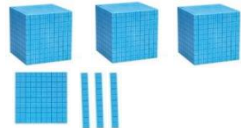
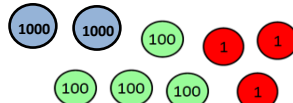
- 1 Fill in the missing values.

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

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

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

- 2 Complete the table.

1,000 less	Number	1,000 more
		
		

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

5,000

7,500

2,359

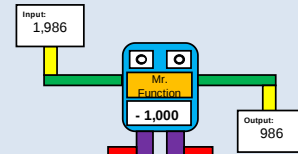
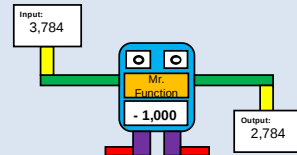
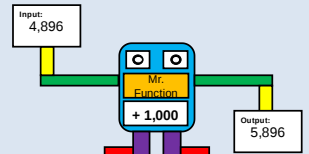
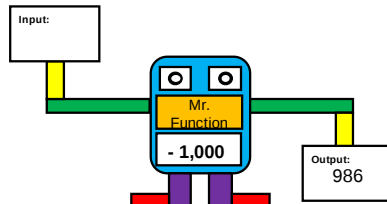
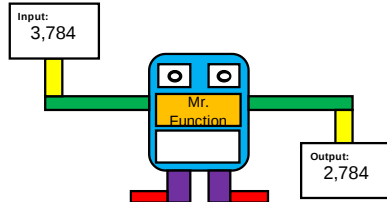
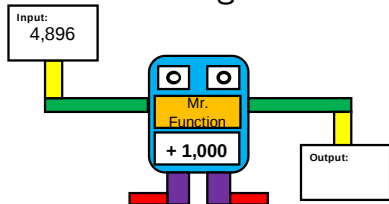
8,999

Use concrete resources to prove you are correct.

1,000 More or Less Than

Reasoning and Problem Solving

Complete the missing boxes:



10 less than my number is 1000 more than 5300. What is my number?

Can you write your own problem similar to this?

6310

Henry says:



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

Is he correct?

Which digit does he need to change?

Fill in the boxes by finding the patterns:

3,210		1,210	
3,110			
			6,010

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

3,210	2,210	1,210	210
3,110			
3,010	4,010	5,010	6,010
2,910			

Compare 4-digit Numbers

Notes and Guidance

In this small step, children should compare 4 digit numbers using comparison language and symbols to determine which is greater and which is smaller.

Mathematical Talk

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

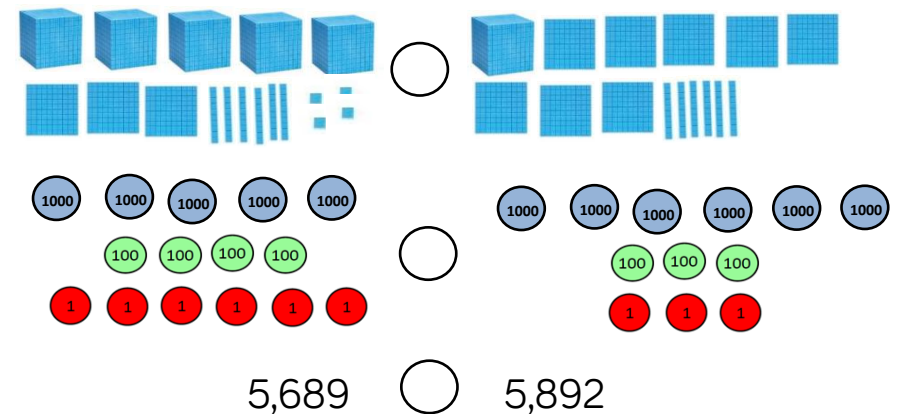
Which column do you start comparing from? Why?

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

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



- 2 Circle the smallest amount.

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

- 3 Complete the statements.

1,985 >

4,203 < 4,000 + + 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?

Possible answers:

3,822
3,741
4,560

Write a sensible number story to compare each pair of numbers:

3,650 and 2,345

9,999 and 2,893

Possible answer:

Stephen and Charlotte play a video game. Stephen scores 3,650 points. Charlotte scores 2,345 points. Who has the most points?

Ordering Numbers

Notes and Guidance

Children explore ordering a set of numbers in ascending and descending order.

Children can then find the largest or smallest number from a set.

Mathematical Talk

Which number is the greatest? Which number is the highest/lowest?

Why have you chosen to order the numbers this way?

What strategy did you use to solve this problem?

Varied Fluency

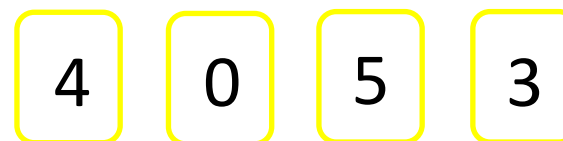
- Put the numbers in order starting with the smallest.

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 a Set of Numbers

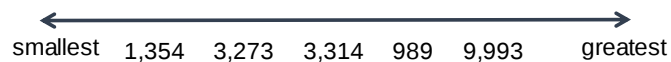
Reasoning and Problem Solving

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

All the other numbers have digit totals of 20

What could the other three numbers be?

Explain the mistake.



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.

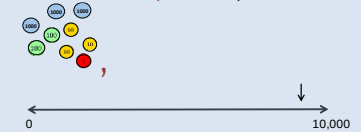
Order these amounts:

Half of 2,400

LXXXVI



LXXXVI,
Half of 2,400 ,



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

Th	H	T	O
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?

Th	H	T	O
1	1	1	3
1	1	2	7
1	2	5	8
1	3	5	9
1	3	8	4
1	4	1	5

Round to the nearest 1000

Notes and Guidance

Within this small step, children are rounding to the nearest thousand for the first time, building on their knowledge of rounding to the nearest 10 and 100.

Children must understand which thousands number a number sits between.

When rounding to the nearest 1000, children should look at the digits in the hundreds column.

Mathematical Talk

Which place value column do we need to look at when we round the nearest 1000?

What does approximately mean?

The word approximately means 'not exact, but close enough to be used'.

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

Can you give an example of this? Can you justify your reasons?

Varied Fluency

- 1 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.

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

- 3 Complete the table.

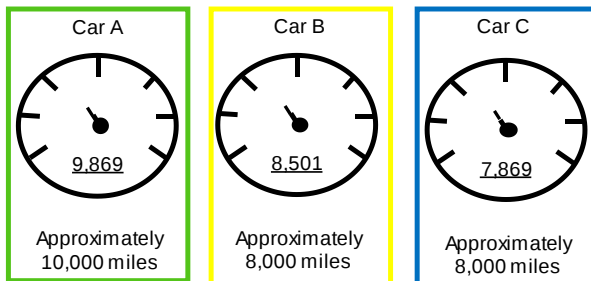
Start number	Rounded to the nearest 10	Rounded to the nearest 100	Rounded to the nearest 1000
4,999			
LXXXII			

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:



Car B is incorrectly advertised - it should be rounded up to 9,000

True or false?

All of the cars are correctly advertised.

Explain your reasoning.

A number is rounded to the nearest thousand.

The answer is 7,000.

What could the original number have been?

Give 5 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

Focusing on patterns, children count in 25s. They use their knowledge of counting in 50s and 100s to become fluent in 25s.

Children should recognise and use the fact that there are four 25s in 100.

Mathematical Talk

Can you notice a pattern as the numbers increase?

What digit do multiples of 25 end in?

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

Varied Fluency

1 Complete the number tracks.

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

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

2 Circle the mistake in each sequence.

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

1,000, 975, 925, 900, 875....

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

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

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

Counting in 25s

Reasoning and Problem Solving

Hayley 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
-

Are these statements always, sometimes or never true?

Possible answers

Multiples of 1,000 are multiples of 25 because 25 goes into 1,000 exactly.

Not all multiples of 25 are multiples of 1,000. i.e 1,075.

Jeff is counting down in 25s from 790, will he say 725?

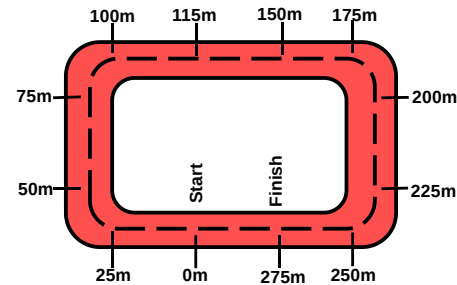
Explain with an example.

Possible answer:
No, he will not say 725 because:

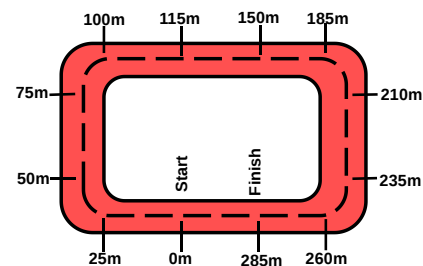
790, 765, 740, 715, 690, 665

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 25m to 100m. After this they have continued to count in 25s correctly from 150

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

Negative Numbers

Notes and Guidance

Children in Year 4 need to recognise that there are numbers below zero. It is essential that this concept is linked to real life situations such as temperature, water depth, money etc.

Children should be able to count back through zero. This can be supported through the use of number squares, number lines or other visual aids.

Mathematical Talk

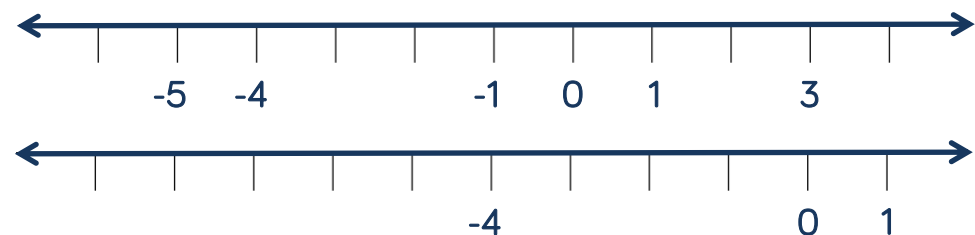
Can you use the words positive and negative in a sentence to describe numbers?

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

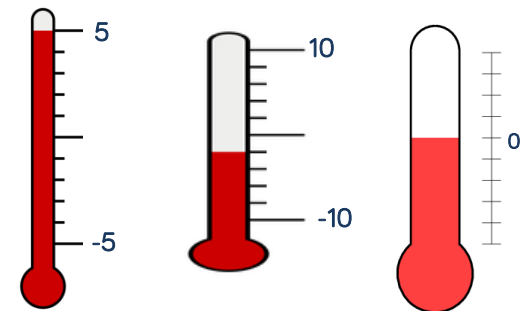
Is -1 degrees warmer or colder than -4 degrees? Can you research the coldest ever recorded temperature on Earth?

Varied Fluency

- 1 Complete the number lines.



- 2 Fill in the temperatures on the different thermometers.



- 3 Zak is counting backwards out loud. He says,

“two, one, minus one, minus two, minus three...”

What mistake has Zak 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, -15, -25

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 other numbers have a difference of 2 but 1 -2 has a difference of 3

c) -25 is incorrect. The other numbers have a difference of 5 and -15 and -25 have a difference of 10

Sam counted down in 3's until he reached -18.

He started at 21.

What was the tenth number he said?

Prove it.

-9

$3 \times 10 = 30$. Then subtract 30 from 21 to get to -9

Anna is counting down from 11 in fives.

Does she say -11?

Prove it.

No

11, 6, 1, -2, -7, -12