

White Rose Maths Hub

Small steps guidance and examples

Year 3

Block 1 – Place Value

Overview

Small Steps

- Hundreds
- Represent numbers to 1,000
- 100s, 10s and 1s (1)
- 100s, 10s and 1s (2)
- Number line to 1,000
- Find 1, 10, 100 more or less than a given number
- Compare objects to 1,000
- Compare numbers to 1,000
- Order numbers
- Count in 50s

NC Objectives

Identify, represent and estimate numbers using different representations.

Find 10 or 100 more or less than a given number

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

Compare and order numbers up to 1000

Read and write numbers up to 1000 in numerals and in words.

Solve number problems and practical problems involving these ideas.

Count from 0 in multiples of 4, 8, 50 and 100

Hundreds

Notes and Guidance

To build on prior learning in Year 2, children need to understand what 100 is.

Children can explore 100 using a variety of different representations.

Once children understand the concept of 100, they will count objects and numbers in multiples of 100 up to 1,000.

Mathematical Talk

How many jars of sweets would you need to have 700 sweets?

Look at the place value chart with 100, 200, 300, 400... in.
What do you notice?

Can you show me this answer in a different way?

What does it mean when the ten and zero column in a place value chart are blank?

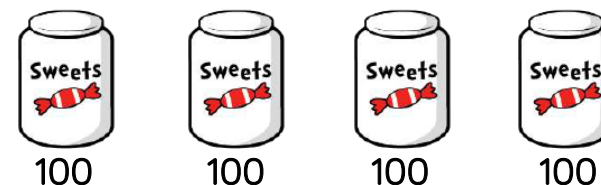
Why did you write a zero?

Why are there two zeros?

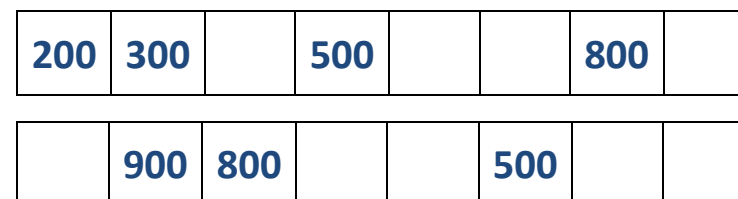
What's the same and what's different between 900 and 1,000?

Varied Fluency

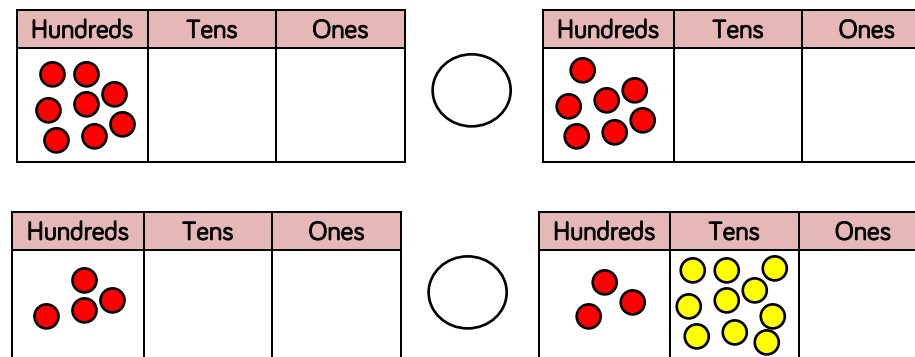
- There are 100 sweets in each jar.
How many sweets are there altogether?



- Complete the number tracks.



- Use $<$, $>$ or $=$ to compare the place value grids.



Hundreds

Reasoning and Problem Solving

If I count in 100s from zero, all of the numbers will be even.
Convince me.

Yes, they will always be even because I am starting with a zero in ones and adding to the hundreds. I do not add anything to the ones so it will always end in a zero which is odd.

Sort these statements into always, sometimes or never.

- When counting in hundreds, the ones column changes.
- The hundreds column changes every time you count in hundreds.
- To count in hundreds we use 3 digit numbers.


When counting in hundreds, the ones column changes.
(never)

The hundreds column changes every time you count in hundreds.
(always)

To count in hundreds we use 3 digit numbers. (sometimes)

Sarah thinks the place value grid is showing the number eight.

Do you agree?
Explain.

Hundreds	Tens	Ones
		

Using all the counters, what is the smallest number you can make with the counters?

I disagree with Sarah because the eight counters are in the hundreds column which shows eight hundreds.

The smallest number I can make is eight.

Numbers to 1,000

Notes and Guidance

Using Base 10 primarily, introduce children to any number up to 1,000. Base 10 will show the children the difference in size so they can clearly see that tens are bigger than ones.

Children need to see numbers with zeros in different columns and show them with concrete and pictorial representations.

They will not use the place value grid in this step but will focus on it in the next step.

Mathematical Talk

Does it matter which order you build the number in?

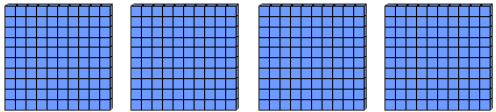
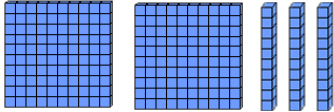
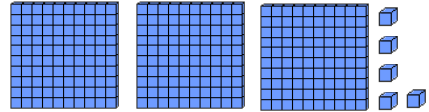
Can you have more than 9 of the same object? E.g. 11 tens

Do you prefer using the Base 10 or drawing the Base 10? Why?

Can you create a part-whole model using or drawing Base 10 in each circle?

Varied Fluency

- 1 Write down the number represented with Base 10 in each case.

Representation	Number
	
	
	

- 2 Use Base 10 to represent the following numbers.

- 700
- 120
- 407
- 999

- 3 Sanjay is drawing numbers. Can you complete them for him?

246



390



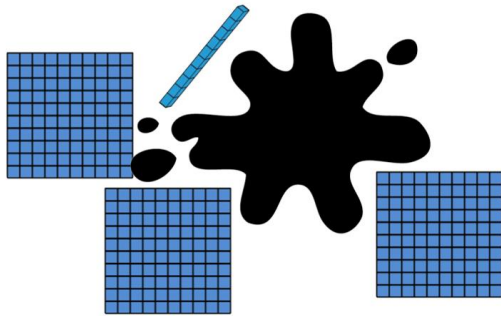
706



Numbers to 1000

Reasoning and Problem Solving

David has 420 in Base 10 but some are covered.



Work out the missing amount.

How many different ways can you make 420 with Base 10?

110 is the missing part.

Possible answers:
1 hundred and 1 ten
110 ones
11 tens
10 tens and 10 ones
50 ones and 6 tens

Which child has made the number 315?

Ben: A diagram showing three blue square blocks representing hundreds, one blue rod block representing a ten, and five blue unit cubes representing ones.

Amir: A diagram showing two blue square blocks representing hundreds, ten blue rod blocks representing tens, and fifteen blue unit cubes representing ones.

Ben and Amir have both made the number 315 but represented it differently.

3 hundreds, 1 ten and 5 ones is the same as 2 hundreds, 10 tens and 15 ones.

100s, 10s, 1s (1)

Notes and Guidance

Children should understand that a 3 digit number is made up of 100s, 10s and 1s.

They can read numbers shown in different representations on a place value grid and be able to write them in numerals. They should be able to represent different 3 digit numbers using a variety of methods such as Base 10 or numerals.

Mathematical Talk

What is the value shown on the place value chart?

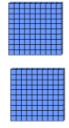


Why is it important to put the values into the correct column on the place value chart?

How many more is needed to complete the place value chart?

Can you make your own numbers for a friend using arrow cards?



Varied Fluency

- 1 What is the value of the number represented in the place value chart?

Hundreds	Tens	Ones
		

Write it in numerals and words.

- 2 Complete this place value chart so that it shows 354

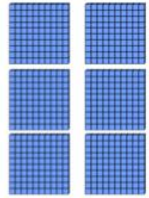
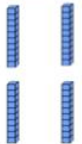

Hundreds	Tens	Ones
		

- 3 What number would this make?



100s, 10s and 1s (1)

Reasoning and Problem Solving

Hundreds	Tens	Ones
		

Steph



The place value grid shows 467

Do you agree?

Explain your reasoning.

What do you notice about the number shown?

I disagree because there are six hundreds in the hundreds column, four tens in the tens column and 7 ones in the ones column.

The number that is shown is 647

I notice that 647 and 467 have the same digits but the digits are worth different values.

5 0 3

Using each digit card, which numbers can you make?

Use the place value grid to help.

100s	10s	1s

Check your answer with a partner.

The numbers that can be made are:

530
350
503
305
53
35

100s, 10s, 1s (2)

Notes and Guidance

Building on previous learning, children should now use place value counters to represent different numbers and understand how a number is made.

Their work with Base 10 should help them understand that the hundreds counter is worth more than the tens counter and the tens counter is worth more than the ones counter.

Mathematical Talk

Why do we not call this number 300506?

Why is it important to put the values into the correct column on the place value grid?

How much is shown?

Can you find all the possibilities?

Can you write a number sentence for Q3?

Varied Fluency

- What number is shown in the place value chart?

Hundreds	Tens	Ones
100 100 100	10 10 10 10 10	1 1 1 1 1

If one more 10 is added. What number would be shown?

- True or false?
The place value grid shows 615

Hundreds	Tens	Ones
100	10 10 10 10 10	1 1 1 1 1

- Put $<$, $>$ or $=$ in the circles to make the statement correct.

100s	10s	1s		100s	10s	1s		100s	10s	1s
100	10 10	1 1 1		100 100	10 10 10	1		100 100 100	10	1 1 1

Reasoning and Problem Solving



Three colored circles are arranged in a triangle. The top-left circle is green and contains the number 100. The top-right circle is red and contains the number 1. The bottom-center circle is yellow and contains the number 10.




Possible answers:
 $100 + 100 + 100 +$
 $100 + 10 + 10 + 10 +$
 $10 + 10$

100 + 100 + 100 + 10
+ 10 + 10 + 10 + 10 +
10 + 10 + 10 + 10 + 10
+ 10 + 10 + 10 + 10 +
10



Alice

A cartoon drawing of a girl with blonde hair in pigtails, large blue eyes, and a small smile. She is wearing a yellow shirt.

Alice is incorrect
because you could
make 800 instead of
611

100s	10s	1s
		

Do you agree?
Prove your answer.

100s	10s	1s
		



The place value chart shows 607

Helen is correct because there are six counters in the hundreds column, zero counters in the tens column and seven counters in the ones.

If it was 670 there would be seven counters in the tens column and no counters in the ones column.



I think it shows 670

Who is correct?

Explain your reasoning.

Number line to 1,000

Notes and Guidance

Children are expected to estimate, work out and write numbers on a number line.

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 draw a number line when 600 is the starting number and 650 is half way?

What value can A definitely not be? How do you know?

Varied Fluency

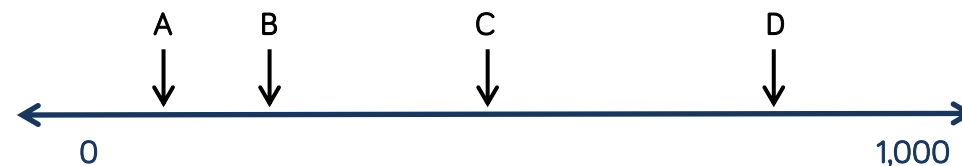
- 1 Draw an arrow to show the number 800



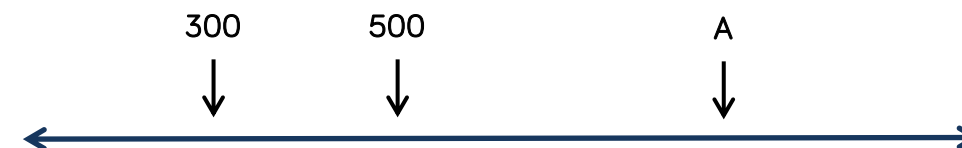
Draw an arrow to show the number 560



- 2 Which letter is closest to 250?



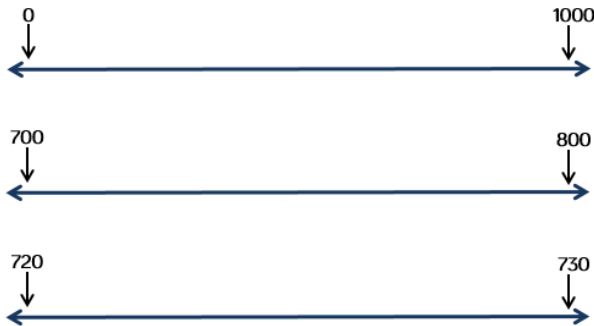
- 3 Estimate the value of A.



Number Line to 1000

Reasoning and Problem Solving

Place seven hundred and twenty five on each of the number lines below.



Explain why seven hundred and twenty five is not at the same place on each number line.

725 is in different places because each line has different numbers at the start and end so the position of 725 changes.

The first line would have 500 at half way so 725 is on the right of the line but the second line has 750 at half way so 725 is on the left of the line.

If the number on the line is 780, what could the start and end numbers be?

Find three different ways and explain your reasoning.



Example answers:

Start 0 end 1000
because 500 would be in the middle and 780 would be further along than 500

Start 730 end 790

Start 700 end 800

1, 10, 100 more or less

Notes and Guidance

Building on children's learning in Year 2 where they explored finding 1 more/less. Children now move onto finding 10 and 100 more or less than a given number.

Show children that they can represent their answer in a variety of ways. For example, as numerals or words or with concrete resources.

Mathematical Talk

What is 10 more than/less than?

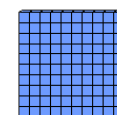
What is 100 more than/less than?
Which column changes?

What happens when I subtract 10 from 209?

Explain why you have chosen to represent your answer. E.g. I have used an image to show my answer because.....

Varied Fluency

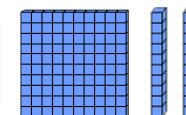
1 Put the correct number in each box.



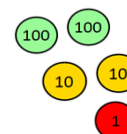
10 less



Number



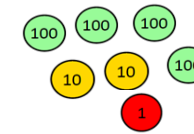
10 more



100 less



Number



100 more

2 Show ten more and ten less than the following numbers using Base 10 and place value counters.

- 550
- 724
- 302

3 Complete the table.

100 less	Number	100 more

1, 10, 100 more or less

Reasoning and Problem Solving

10 more than my number is the same as 100 less than 320

What is my number?

Explain how you know.

Write your own problem similar to describe the original number.

The number described is 210. I know this because 100 less than 320 is 220, which means 220 is 10 more than the original number.

A similar problem could be; 10 less than my number is the same as 100 more than 100

I think of a number and add 10, subtract 100 and subtract 1

My answer is 256

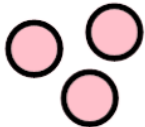
What number did I start with?

What can you do to check?

The start number was 345

To check I can start at 345 add 10 which is 355, subtract 100 which is 255 and add 1 which is 256

A counter has dropped off the place value chart.

Hundreds	Tens	Ones
		

What number could it have been?

If a counter fell from the ones, the number would be 302

If a counter fell from the ten, the number would be 311

If a counter fell from the hundreds, the number would be 401

Comparing Objects

Notes and Guidance

Children continue to use objects to represent numbers to 1,000.

When given two numbers represented by objects, they use comparison language and symbols to determine which is greatest and which is smallest. Children can build up the numbers using concrete manipulatives and draw them pictorially.

Use stem sentences to ensure the correct vocabulary is being used e.g. ____ is greater than ____

Mathematical Talk

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

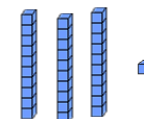
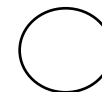
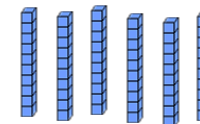
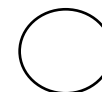
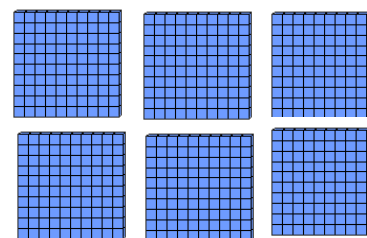
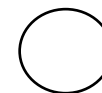
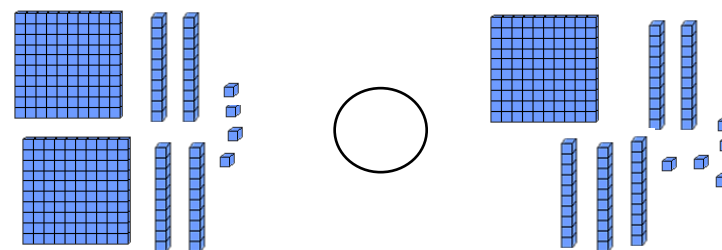
What strategy did you use to compare the two numbers? Is this the same or different to your partner?

Are the Base 10 and place value counters showing the same amount? How do you know?

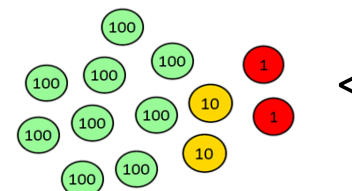
Is there only one answer?

Varied Fluency

1 Fill in the circle with $<$, $>$ or $=$



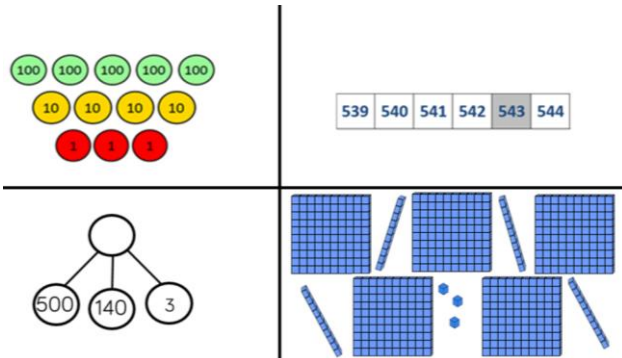
2 Draw objects to make the statement true.



Comparing Objects

Reasoning and Problem Solving

Which image is the odd one out?



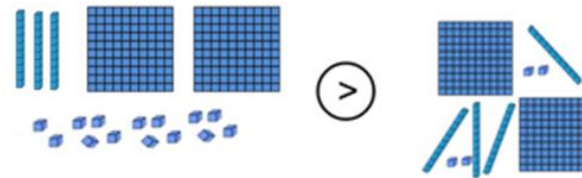
Explain why.

How else can you represent the number?

The part whole model is the odd one out because it shows 643. All the other images show 543.

Children could show 543 in a part whole model correctly; in Base 10 a different way or with place value counters a different way.

True or false?
Explain.



What could you do to make the image correct?

The image is not correct because the number 244 is represented on both sides of the inequality symbol.

An equals sign should have been used.

To make it correct I could add something to the number on the left or take away something from the right.

Comparing Numbers

Notes and Guidance

Children will be given numbers as digits rather than objects. They need to be encouraged to use previous learning to choose an efficient method to compare the numbers.

For example, children may:

- Place numbers on a number line
- Make the numbers using a concrete representation and compare each column
- Draw the numbers in a place value chart and compare each column

Mathematical Talk

What was your strategy to compare the two numbers?

Which column is the greatest? Why?

Which column do you start comparing from? Why?

Varied Fluency

- 1 Circle the greatest amount in each case.

Nine hundred and two 920

500 and 63 568

7 hundreds and 6 ones 76 tens

- 2 Fill in the circle with $<$, $>$ or $=$

399 501

800 80 tens

- 3 Complete the statements.

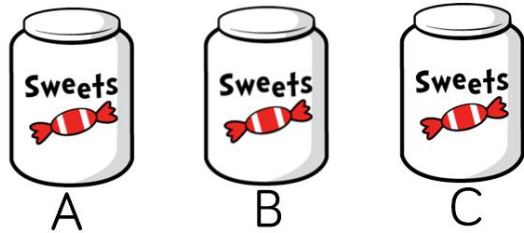
$600 + 70 + 4 > 600 + \dots + 4$

Two hundred and five $< \dots$

Comparing Numbers

Reasoning and Problem Solving

Patryk has 3 jars of sweets.



A has 235 sweets.
C has 175 sweets.

A has the most and C
has the least.



Patryk

How many sweets could be in B?

Explain how you know.

B could be anything
between and including
176 to 234

*Discussion point:
Can it be 235 or 175?*

*It cannot because it
would have to be
phrased 'A and B have
the least'.*

I am thinking of a number.

It is between 300 and 500

The digits add up to 14

The difference between the greatest
digit and smallest digit is 2

What could my number be?

Is there only one option?

Explain your method of working it out.

446 or 464

Possible method:
Only options for
hundreds column are 3
and 4
Start with 3 and have 11
left to make 14
There are no pairs of
numbers to make 11
with a difference of 2
Start with 4 and have 10
left to make. 6 and 4
have a difference of 2

You cannot use any
other pairs to 10
because the difference
between the greatest
and smallest would be
more than 2

Ordering Numbers

Notes and Guidance

Children explore ordering a set of numbers from smallest to greatest and greatest to smallest.

They need to be able to explain their reasoning for their choices.

At this point children are introduced to the words ascending and descending.

Mathematical Talk

Which has the fewest/most?

Which number is greater?

Which number is the least?

Why have you chosen to order the numbers this way?

Varied Fluency

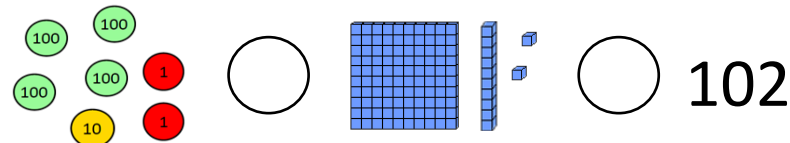
1 Here are three digit cards.





What is the greatest number you can make?

What is the smallest number you can make?

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



3 Jenny put some numbers in ascending order then ink spilt onto her page covering two of the numbers.

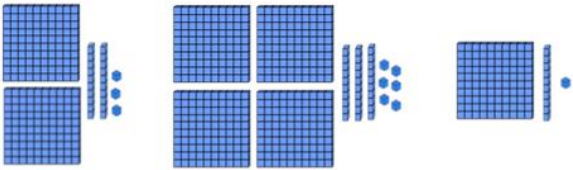
214,  243, 256,  289

What could the numbers be?

Ordering Numbers

Reasoning and Problem Solving

The numbers are ordered from smallest to greatest.



Is this correct?

Explain your answer.

It is incorrect because the Base 10 are showing (from L-R) 223, 436, 111

They should be ordered 111, 223, 436

True or false?

You must look at the highest place value column first when ordering any numbers.

True because columns on the left are made up from columns on the right. There this will tell you the greatest value.

Count in 50s

Notes and Guidance

Children use their knowledge of the patterns in the 5 times table to count in steps of 50.

Children should start from a multiple of 50 and be able to count forwards and backwards.

Mathematical Talk

Can you notice a pattern as the numbers increase?

Explain how you have ordered the numbers.

Why is correct place value important when ordering numbers in a sequence?

What relationship do you notice between the 5 times table and 50 times table?

Varied Fluency

1 Complete the number tracks.

50		150	200			350		450	
----	--	-----	-----	--	--	-----	--	-----	--

	750	700	650			500			350
--	-----	-----	-----	--	--	-----	--	--	-----

2 Circle the mistake in each sequence.

50, 100, 105, 200, 250, 300.....

990, 950, 900, 850, 800.....

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

5	10	15	20	25	30
---	----	----	----	----	----

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

Count in 50s

Reasoning and Problem Solving

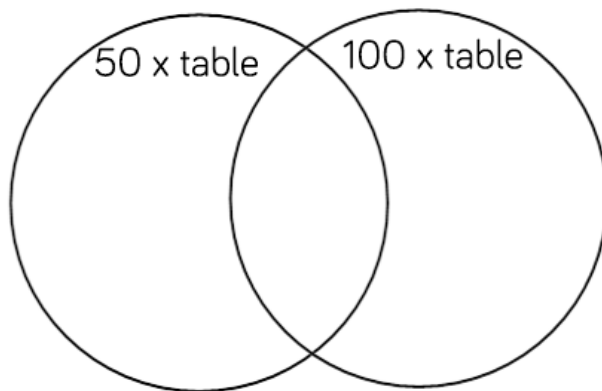
Circle the odd one out.

100, 150, 200, 215, 300

Explain how you know.

The odd one out is 215 as it is not in the 50 times table and the next number in the sequence should be 250

Create calculations for your friends to sort into the diagram



Possible answers:
Double 25
Half of 200
 $300 - 150$
 $400 + 100$
Double 150

Sort these statements into always, sometimes or never.

- When counting in 50s, the numbers are even.
- There are only two digits in a multiple of 50
- Only the hundreds and tens column changes when counting in 50s.

When counting in 50s, the numbers are even (always)

There are only two digits in a multiple of 50 (sometimes)

Only the hundreds and tens column changes when counting in 50s (sometimes)

Which is quicker: counting to 50 in 10s or counting to 150 in 50s?

Explain your answer.

It is quicker to count to 150 in 50s as it would only be 3 steps. It would be 5 steps to count in 10s to 50