Number & Place Value: Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.

Learning focus	Write out the partitioning for any number up to 10 million.

Greater Depth Challenge:

Digit sum is where you add all the digits in a number

e.g. the number 112, the digit sum is 1+1+2= 4

Create seven digit numbers where the digit sum is six and the tens of thousands digit is two.

Fred says he has the largest number, what could his number be?
Wilma says she has the smallest number, what could her number be?
Justify your choices.

Greater Depth Challenge:

I am thinking of a number:
It is made up of 35 hundreds, 75 thousands and 41 hundred thousands.
Can you write the number in digits?
Can you write it in words?

What is 2 million more than my number? What is 1.5 million less than the number?

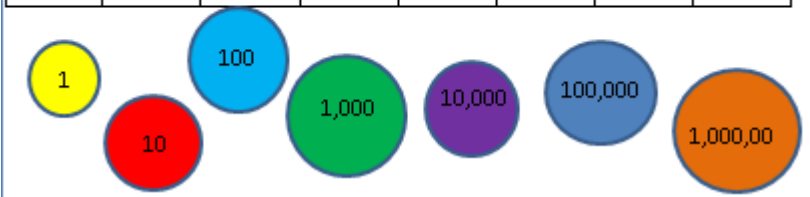
Greater Depth Challenge:

I'm thinking of a 3 digit number
The digits have a sum of 14
The difference between the hundreds digit and the tens digit is one.
What could my number be?
How many other solutions can you find?

Greater Depth Challenge:

How many ways can you show the number _____?

TM	M	HTh	TTh	Th	H	T	O

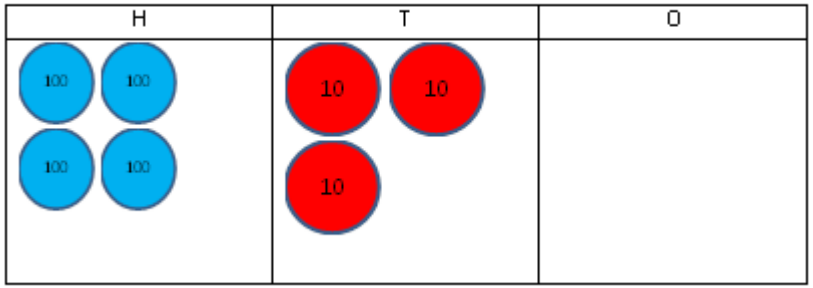


Number & Place Value: Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.

Learning focus	Write out the partitioning for any number up to 10 million.

Greater Depth Challenge:

Sue says this number is 43. Is she right? Justify your decision.



Can you help her?

Greater Depth Challenge:

TM	M	HTh	TTh	Th	H	T	U
	8	4	7	0	6	8	0

Can you find three other ways to show this number?

Greater Depth Challenge:

My first number has: 4 Millions; 2 Hundred Thousands; 12 Thousands; 4 Hundreds; 5 Tens and 6 Ones.

My second number has: 4 Millions; 2 Hundred Thousands; 13 Thousands; 4 Hundreds; 5 Tens and 6 Ones.

Can you write a number (in digits) that is larger than my first number and smaller than my second number?

Learning focus	Know what each digit is worth in a number, e.g., There are two 5s in this number, how much is each worth? 45, 327,651.

Greater Depth Challenge:

6,743,450

What is the value of the digit '7'?
What is the value of the digit '6'?

Mr 'G Depth' says the number has 67 hundred thousands
Do you agree? Explain your answer.

Greater Depth Challenge:

☐0, 034

My number has exactly 300 hundreds in it. Can you put the correct digit in the empty box?

42,☐04

My number has exactly 270 tens in it. Can you put the correct digit in the empty box?

Greater Depth Challenge:

Tom has £53, 450

Kate has £93, 350

True or false?

Tom says that he has more money because he has 45 tens and Kate only has 35 tens.
Kate says that both of them have exactly 30 hundreds in their number.

Greater Depth Challenge:

5, 367, 643 **46, 742**

What is the same, what is different?

100s	10s	1s
1	9	3

193 Can be shown in different ways...

What is the same?

What is different?

100s	10s	1s
	190	3

Which is correct? Why?

Learning focus	Know what each digit is worth in a number, e.g., There are two 5s in this number, how much is each worth? 45, 327,651.

Greater Depth Challenge:

The digit 5 in the number 503 can be described as: 5 Hundreds; 50 Tens; and 500 ones.

How many different ways can you show the value of the underlined digit in each of these numbers?

1. 4, 196
2. 127, 487
3. 4, 895, 213
4. 9, 800, 470

Learning focus	Recall how to read large numbers by counting the digits to the left of any decimal place in chunks of three.

Greater Depth Challenge:

Captain Conjecture says, 'A number that has 10 digits will always be greater than a number that has 9 digits'

Do you agree?

Can you give an example that proves that he is correct, or incorrect?

Greater Depth Challenge:

I'm thinking of a number.
There is a 7 is the ten millions place. There is a 3 in the millions place. The total sum of all the digits together makes sixteen.
What could my number be?
List all the possible options.

Can you write a problem similar to think and record the possible options?

Greater Depth Challenge:

Using the digits:

7, 0, 3, 9, 4, 6, 5 ,2,8

What's the largest number you can make?

What's the smallest number you can make?

What would the result be if you subtract the smallest from the largest value numbers?

Greater Depth Challenge:

Look at these numbers

67, 607, 508, 409 **and** 67,504, 603, 702

What is the same? What is different?

How many patterns can you identify?

Learning focus	Order a set of numbers up to 10,000,000, Including with up to three-decimal places.

Greater Depth Challenge:

Look at this number:

6, 981, 453

Can you write four numbers to follow it that go from greatest to smallest? You can only use the digits in the same place once.

1. 6, 981, 453
2.
3.
4.

Greater Depth Challenge:

Work out the result of these calculations and then place them in ascending order.

0.09 x 1000	**0.3 x 30**	**9,000 ÷ 10,000**	**9000 ÷ 10**

Explain how you know which order these go in without having to work out the answer first.

Greater Depth Challenge:

What digits could go in these missing boxes to order these 4 numbers in descending order and then ascending order? You can only use the digits 0-9 once.

6,□6□,572

6,7□□, 936

6,□8□,0□2

6□, □91,□□3

Greater Depth Challenge:

Put these numbers in ascending order.

1. 1, 607, 721.34 1,607,721.034 1,607,721.304
2. 10(tothepowerof4) 10.5 x 1000 1,0000 1/10th of 110,000
3.

Population	18.6	18,134,835	18.5 million	18,131,850
Country	Burkina Faso	Mali	Syria	Chile

Learning focus	Compare a set of numbers up to 10,000,000, including those with up to three-decimal places.

Greater Depth Challenge:

$50362 > n$

$n < 4000$

n is an even number and is the sum of two squared numbers.

What could *n be?*

Greater Depth Challenge:

_____,_____, ☐ ,_____,_____,_____,_____,

Order these sets of numbers from smallest to largest by writing the correct letter on each line. What number can go in the box? Explain why?

(a) 100 more than 16,006
(b) 6^2
(c) One thousand six hundred and one
(d) 10.6 x 100
(e) 3006 greater than 6,009,000 divided by 10^2

Greater Depth Challenge:

3.☐☐☐☐ 3.☐☐☐

Can you use the symbols and numbers below to make the above number sentences correct.

< > 0 6 9 1 4

How many sentences can you make? How do you know when you have found them all?

Greater Depth Challenge:

You have the choice of 3 different amounts of money. What amount would you choose and why?

£53892 £5489 5093892p five million pounds

Would you choose to have the amount in pounds or in another currency? Why?

Number & Place Value: Round any whole number to a required degree of accuracy.

Learning focus	Round large numbers to the nearest power of 10 required, using the most significant digit for the task.

Greater Depth Challenge:

For each of these numbers, write 5 numbers that can be rounded to it when they are rounded to the nearest 1000.

2000 **3495** **45627** **912345**

Greater Depth Challenge:

Write two 7 digit numbers.

Add the two numbers and round to the nearest million.

Now round the original numbers to the nearest million and add them. Do you get the same answer?

Now try different pairs of numbers.

What do you find?

Greater Depth Challenge:

Ali is rounding a five digit number to the nearest 1000 and to the nearest 100.

Both times that he rounded, the digit in the thousands column was 3.

Can you write down his 5 digit number?

□□□□□

Is this the only possible answer?

Explain why?

Greater Depth Challenge:

Three pupils are asked to estimate the answer to the calculation 5243 - 2734

Andrew says to the nearest hundred the answer will be 2500

Bilal says to the nearest 50, the answer will be 2500

Si says to the nearest 10, the answer will be 2510

Do you agree with **Andrew, Bilal or Cheng?**

Can you explain their reasoning?

Number & Place Value: Round any whole number to a required degree of accuracy.

Learning focus	Round large numbers to the nearest power of 10 required, using the most significant digit for the task.

Greater Depth Challenge:

Fred says he has four cards, each card has a number

59,996 59,943 60,026 62,312

He gives a card to each pupil. The pupils each say a clue.

Wilma says, “My number has exactly 600 hundreds in it.”

Pebbles say,” My number has more hundred hundreds in it than that.”

Barney says,” My number is 59,900 to the nearest hundred.”

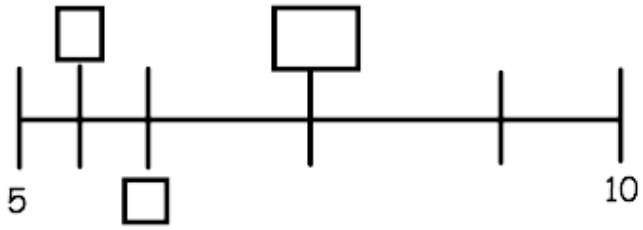
Dino says, “My number is 60,000 to the nearest 10.”

Can you work out which card each pupil had? Explain your choices

Learning focus	Estimate the position of numbers on a number line with different starting and finishing points and justify, e.g., Suggest which number lies about two-fifths of the way along a line from 0 to 1,000,000

Greater Depth Challenge:

Can you fill in the missing numbers? Explain how you worked it out.



Greater Depth Challenge:

In 2016, the highest grossing films of all time in the UK were:

Star Wars – 123.0 million
James Bond- 103.2 million
Toy Story – 74 million
Harry Potter- 73.1 million.

Draw your own number line and estimate where each film would be placed. Think about the scale and the increments you will count up in.

Greater Depth Challenge:

Circle the numbers that could be place in the red box.

2.3 million 2,115, 235 1.75 million 1,900, 099

Then write down four possible numbers that could be included in the green box.

Greater Depth Challenge:

Max has been asked to estimate where these stars will be placed on the number line based on their surface temperature (measured in Kelvin).

A: Sun (5,777k)
B: Betelgeuse (3,500 k)
C: Rigel (11,000k)
D: North Star (6,000k)
E: Sirius (9,940 k)

Max has already estimated where the sun will be. Is he correct? Explain your answer and then estimate where the other stars will go.

Learning focus	Round decimals to the nearest whole number or to one-, two- or three-decimal places.

Greater Depth Challenge:

Two numbers each with two decimal places round to 23.1 to one decimal place.

The total of the numbers is 46.2

What could the numbers be?

Greater Depth Challenge:

6.345

6.453

6.543

Wilma says two of these numbers round to the same number with one decimal place? Fred disagrees. Who is right? Explain your reasoning

Greater Depth Challenge:

Wilma says that these numbers can all be rounded to 20

19.95 20.1 19.09 20.09 20.201

Is she correct? Explain your reasoning

Give 3 different numbers all having 3 decimal places that can also round to 20

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Greater Depth Challenge:

Louie says, 'Usain Bolt runs the 100m in 10 seconds (to the nearest 1) and I run 100m in 9.723 seconds.'

He says, 'I am definitely faster than Usain Bolt because 9.723 seconds is quicker than 10.000 seconds.'

Do you agree with him?

<u>Number & Place Value:</u> Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.

Learning focus	Use negative numbers in context, and calculate intervals across zero.

<u>Greater Depth Challenge:</u>

Your bank balance is sixty three pounds in credit. You have an overdraft of up to one hundred and fifty pounds. You are going shopping for Christmas presents and do not want to exceed your overdraft limit. What combination of these gifts can you purchase?
How many different combinations can you think of?

- Rudolph socks £3.99
- Selfie stick £5.75
- Box of chocolates £12.25
- iPhone 5s £125.00
- Remote controlled car £33.45
- Mini drum set £46.45

<u>Greater Depth Challenge:</u>

You have 20 cards numbered -10 to 10.

You also have operation cards (+ and -).

What number sentences can you make to get the answer 5?

<u>Greater Depth Challenge:</u>

Give reasons as to why these statements are true or false:

- The temperature is -5C outside and 23C inside. The difference is 18C.
- On Monday at 8 am the temperature was -5.05C, on Tuesday the temperature was -5.005. Kat said Monday was warmer than Tuesday.
- 37 more than -28 is -65

<u>Greater Depth Challenge:</u>

The temperature on Monday is the difference in temperature between Saturday and Thursday.
Tuesday was 2.2C
Wednesday was the same temperature as the warmest temperature.
Thursday was 2C colder than Friday
Saturday was twice as cold as Sunday and 7C colder than Friday.
Sunday was -1.6C.
What was Monday's temperature?

Learning focus	Find the difference between pairs of negative numbers, or one positive and one negative number, in context

Greater Depth Challenge:

In a quiz, teams earn 2 points for every correct answer and lose 2 points for every wrong answer. Team A have a score of -12 points. What is the minimum number of correct answers they need to get a score of 20?

The team answers 20 questions before reaching their target. How many questions did they get wrong? Can you show this on a number line?

The last round of the quiz is a 5 question round. What are all the possible scores the team can score from 5 questions?

Greater Depth Challenge:

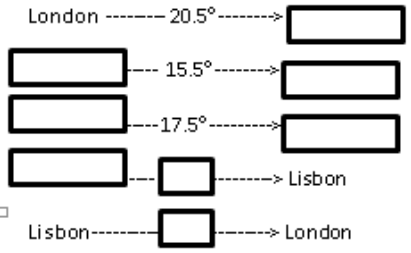
Three people checked their bank accounts on Friday. Over the weekend some of them won money on the lottery. Look at their new amount, who won the most money? Who didn't win any money? Justify your choice.

Name	Friday	Monday
Kevin	-£43	-£97
Louise	-£24	£15
Chris	-£56	-£21

Greater Depth Challenge:

London	3°
Stockholm	-12°
Lisbon	7°
Sydney	25°
Paris	-2°
Berlin	-5°
Helsinki	-17.5°
Oslo	-19.5°

On my travels, I started in London. From there I visited four places and then returned to home. I have worked out the difference between each place. Can you work out my route and any missing differences in temperatures?



Greater Depth Challenge:

Would you rather?

You want to be as warm as possible. Where would you rather be?

London 3° Stockholm -12° Helsinki -7.5° Berlin -5°
Oslo -10.5° Paris 0° Moscow -7°

Vienna's temperature is the difference between Stockholm and Helsinki.

Prague's temperature is the difference between Berlin and London.

Dublin's temperature is the difference between Oslo and Moscow.