

White

**Rose
Maths**

Autumn - Block 1

Place Value

Overview

Small Steps

- Numbers to ten million
- Compare and order any number
- Round any number
- Negative numbers

NC Objectives

Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.

Round any whole number to a required degree of accuracy.

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

Solve number and practical problems that involve all of the above.

Numbers to Ten Million

Notes and Guidance

Children need to read, write and represent numbers to ten million in different ways.

Numbers do not always have to be in the millions – they should see a mixture of smaller and larger numbers, with up to seven digits. The repeating patterns of ones, tens, hundreds, ones of thousands, tens of thousands, hundreds of thousands could be discussed and linked to the placement of commas or other separators.

Mathematical Talk

Why is the zero in a number important when representing large numbers?

What strategies can you use to match the representation to the correct number?

How many ways can you complete the partitioned number?

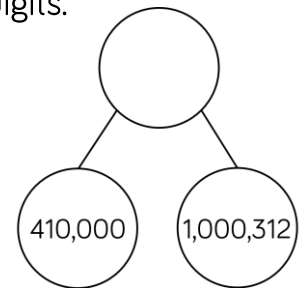
What strategy can you use to work out Teddy's new number?

Varied Fluency

Match the representations to the numbers in digits.

One million, four hundred and one thousand, three hundred and twelve.

M	HTh	TTh	Th	H	T	O
•		•• ••	•	•• ••	•	•• •



1,401,312

1,041,312

1,410,312

Complete the missing numbers.

$$6,305,400 = \underline{\hspace{2cm}} + 300,000 + \underline{\hspace{2cm}} + 400$$

$$7,001,001 = 7,000,000 + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$42,550 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + 50$$

Teddy's number is 306,042
He adds 5,000 to his number.
What is his new number?

Numbers to Ten Million

Reasoning and Problem Solving

Put a digit in the missing spaces to make the statement correct.

$$4,62 _ ,645 < 4,623,64 _$$

Is there more than one option? Can you find them all?

Dora has the number 824,650

She subtracts forty thousand from her number.

She thinks her new number is 820,650

Is she correct?

Explain how you know.

The first digit can be 0, 1, 2 or 3
 When the first digit is 0, 1 or 2, the second digit can be any.
 When the first digit is 3, the second digit can be 6 or above.

Dora is incorrect because she has subtracted 4,000 not 40,000
 Her answer should be 784,650

Use the digit cards and statements to work out my number.



- The ten thousands and hundreds have the same digit.
- The hundred thousand digit is double the tens digit.
- It is a six-digit number.
- It is less than six hundred and fifty-five thousand.

Is this the only possible solution?

Possible solutions:

653,530
 653,537
 650,537
 650,533

Compare and Order

Notes and Guidance

Children will compare and order whole numbers up to ten million using numbers presented in different ways.

They should use the correct mathematical vocabulary (greater than/less than) alongside inequality symbols.

Mathematical Talk

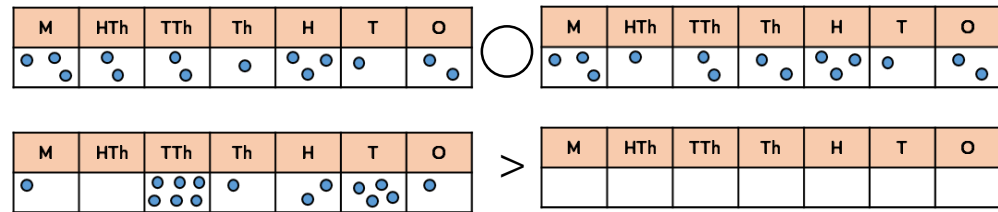
What is the value of each digit in the number?
What is the value of _____ in this number?

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

What do you know about the covered number?
What could the number be? What must the number be? What can't the number be?

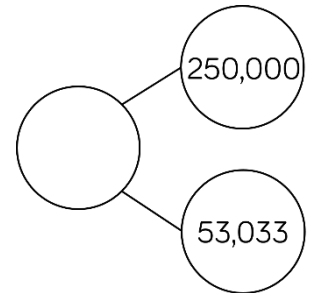
Varied Fluency

Complete the statements to make them true.



What number could the splat be covering?

Three hundred
and thirteen
thousand and
thirty-three



Greatest →

Smallest

A house costs £250,000
A motorised home costs £100,000
A bungalow is priced halfway between the two.
Work out the price of the bungalow.

Compare and Order

Reasoning and Problem Solving

Eva has ordered eight 6-digit numbers.

The smallest number is 345,900

The greatest number is 347,000

All the other numbers have a digit total of 20 and have no repeating digits.

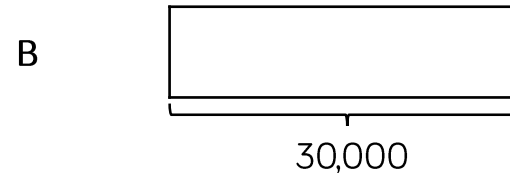
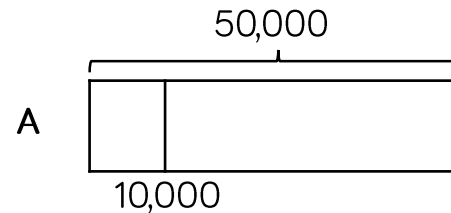
What are the other six numbers?

Can you place all eight numbers in ascending order?

The other six numbers have to have a digit total of 20 and so must start with 346, _ _ _ because anything between 345,900 and 346,000 has a larger digit total. The final three digits have to add up to 7 so the solution is:

345,900
346,025
346,052
346,205
346,250
346,502
346,520
347,000

Jack draws bar model A. His teacher asks him to draw another where the total is 30,000



Explain how you know bar B is inaccurate.

Bar B is inaccurate because it starts at 10,000 and finishes after 50,000 therefore it is longer than 40,000

Round within Ten Million

Notes and Guidance

Children build on their prior knowledge of rounding.

They will learn to round any number within ten million.

They use their knowledge of multiples and place value columns to work out which two numbers the number they are rounding sits between.

Mathematical Talk

Why do we round up when the following digit is 5 or above?

Which place value column do we need to look at when we round to the nearest 100,000?

What is the purpose of rounding?

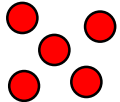
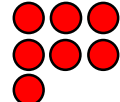
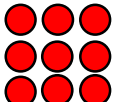
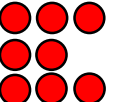
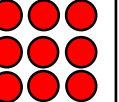
When is it best to round to 1,000? 10,000?

Can you justify your reasoning?

What could/must/can't the missing digit be?

Explain how you know.

Varied Fluency

HTh	TTh	Th	H	T	O
					

Round the number in the place value chart to:

- The nearest 10,000
- The nearest 100,000
- The nearest 1,000,000

Write five numbers that round to the following numbers when rounded to the nearest hundred thousand.

200,000

600,000

1,900,000

Complete the missing digits so that each number rounds to one hundred and thirty thousand when rounded to the nearest ten thousand.

12 __ ,657

1 __ 1,999

13 __ ,001

Round within Ten Million

Reasoning and Problem Solving

My number is 1,350 when rounded to the nearest 10



Mo

The greatest possible difference is 104 (1,345 and 1,449)



Rosie

My number is 1,400 when rounded to the nearest 100

Both numbers are whole numbers.

What is the greatest possible difference between the two numbers?

Whitney rounded 2,215,678 to the nearest million and wrote 2,215,000

Can you explain to Whitney what mistake she has made?

There should be no non-zero digits in the columns after the millions column.

Miss Grogan gives out four number cards.

15,987

15,813

15,101

16,101

Four children each have a card and give a clue to what their number is.

Tommy says, "My number rounds to 16,000 to the nearest 1,000"

Alex says, "My number has one hundred."

Jack says, "My number is 15,990 when rounded to the nearest 10"

Dora says, "My number is 15,000 when rounded to the nearest 1,000"

Can you work out which child has which card?

Tommy: 15,813

Alex: 16,101

Jack: 15,987

Dora: 15,101

Negative Numbers

Notes and Guidance

Children continue their work on negative numbers from year 5 by counting forwards and backwards through zero.

They extend their learning by finding intervals across zero. Number lines, both vertical and horizontal are useful to support this, as these emphasise the position of zero. Children need to see negative numbers in relevant contexts.

Mathematical Talk

Are all negative numbers whole numbers?
Why do the numbers on a number line mirror each other from 0?

Why does positive one add negative one equal zero?
Can you use a number line to show this?

Draw me a picture to show 5 subtract 8
Show 5 more than -2 on a number line.
Could Mo really afford the jumper? How do you know?

Varied Fluency

Use sandcastles (+1) and holes (−1) to calculate. Here is an example.

$$-2 + 5 =$$

Two sandcastles will fill two holes. There are three sandcastles left, therefore negative two add five is equal to three.

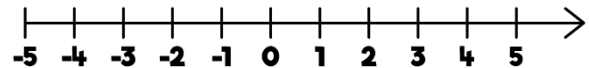
Use this method to solve:

$$3 - 6$$

$$-7 + 8$$

$$5 - 9$$

Use the number line to answer the questions.



- What is 6 less than 4?
- What is 5 more than -2 ?
- What is the difference between 3 and -3 ?

Mo has £17.50 in his bank account. He pays for a jumper which costs £30
How much does he have in his bank account now?

Negative Numbers

Reasoning and Problem Solving

A company decided to build offices over ground and underground.

If we build from -20 to 20 , we will have 40 floors.



Do you agree? Explain why.

No, there would be 41 floors because you need to count floor 0

When counting forwards in tens from any positive one-digit number, the last digit never changes.

When counting backwards in tens from any positive one-digit number, the last digit does change.

Can you find examples to show this?

Explain why this happens.

Possible examples:

9, 19, 29, 39 etc.

9, -1 , -11 , -21

This happens because when you cross 0, the numbers mirror the positive side of the number line. Therefore, the final digit in the number changes and will make the number bond to 10