

Y6- Overview

	Autumn 1		Autumn 2		Spring 1		Spring 2		Summer 1		Summer 2			
Unit	1	2	3	4	5	6	7	8	KS2 tests	9	10	11	12	13

- Number and place value
- Number facts
- Addition and subtraction
- Multiplication and division
- Fractions
- Geometry
- Other

Autumn 1	Understand place value within numbers with up to 7 digits (1 week)
Ready to progress	6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). 6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning. 6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. 6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
NCETM documents	TEACHING POINT 1 AND 2 (UP TO 26) https://www.ncetm.org.uk/media/sbrc5pmz/ncetm_mm_spl_y6_se30_teach.pdf#page=4
Small steps	- To identify and explain patterns in powers of ten. - To compose one million and ten million in different ways. - To solve problems using knowledge of the composition of powers of 10. - To read and write numbers up to 10 million. - To represent numbers up to 10 million
Links	NCETM SLIDES to SLIDE 69- https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2Fsptdce0j%2Fcp-year-6-unit-3-numbers-up-to-10-000-000.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/order-compare-and-calculate-with-numbers-up-to-8-digits/lessons?sid-96699a=02fchGSQLU&sm=0&src=3 WHITE ROSE https://assets.whiteroseeducation.com/new-schemes/Y6%20Autumn%20Block%201%20SOL%20Place%20value.pdf Mastery with greater depth https://www.ncetm.org.uk/media/uitjlx5g/mastery_assessment_y6.pdf
Reasoning	Create six-digit numbers where: - The digit sum is 5 - The thousands digit is 2 - E.g. 300200, 210002 - What's the smallest possible number that fits? - What's the largest? Objective: To read, write, and construct six-digit numbers logically. 📌 On the Number Line - Place the following numbers on an unlabelled number line: 240000, 80000, 480000, 120000, 999000 - How did you estimate their positions? Objective: To place five- and six-digit multiples of 1,000 on an unlabelled number line. 🌱 Build 10,000 - How can you make 10,000 using: - Two or more 5,000s 2,500s and 2,000s - A mixture of 1,000s, 500s, and 100s - Write as many different combinations as you can. Objective: To explain how 10,000 is made up of smaller values. 📦 Build 100,000 - Break 100,000 into combinations of: 50,000s 25,000s 20,000s and 10,000s - Can you do it using only five parts? Ten parts? Objective: To explain how 100,000 is composed of smaller values. 📊 Read the Scale - A graph shows population growing by 25,000 every year from 0 to 100,000. - Read and describe what the graph shows each year. - What does each step represent? Objective: To read scales on graphs using understanding of 10,000 and 100,000 composition.

Understand place value within numbers with up to 7 digits
(1 week)

Problem solving

[Click on me](#)

Glossary

- Powers of 10 - A power of 10 is when 10 is multiplied by itself a certain number of times.
- Million - One million is composed of one thousand thousands. We write one million as a one followed by six zeros.
- Composition - The composition of a whole is the way in which it is made. For example, in the context of this lesson, we will look at equal parts of the whole.
- Million - One million is composed of 1,000 thousands. One million is written as a one followed by six zeros.
- Separator comma - A place value separator comma is used to partition longer numbers to aid in the efficient reading of numbers.
- Placeholder - A placeholder is where we use the digit zero to hold a place in a number and maintain place value. Placeholders are used so that we can write numerals properly.

Stem sentences

Representations

Place-value in 1,000,000:

1,000,000								
Millions			Thousands			Ones		
100s	10s	1s	100s	10s	1s	100s	10s	1s
		1	0	0	0	0	0	0

Unitising:

999,000 (999 thousands)

1,000,000 (1,000 thousands)

Gattegno chart:

10,000,000	20,000,000	30,000,000	40,000,000	50,000,000	60,000,000	70,000,000	80,000,000	90,000,000
1,000,000	2,000,000	3,000,000	4,000,000	5,000,000	6,000,000	7,000,000	8,000,000	9,000,000
100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	70	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

1,000,000			
250,000	250,000	250,000	250,000

1,000,000 ÷ 4 = 250,000

1,000,000 ÷ 250,000 = 4

$\frac{1}{4} \times 1,000,000 = 250,000$

$1,000,000 \times \frac{1}{4} = 250,000$

4 × 250,000 = 1,000,000

250,000 × 4 = 1,000,000

Number line:

Place-value table:

Millions			Thousands			Ones			-ths	
100s	10s	1s	100s	10s	1s	100s	10s	1s	$\frac{1}{10}$	$\frac{1}{100}$
								0	0	1
								0	1	
								1		
							1	0		
					1	0	0	0	0	
				1	0	0	0	0	0	
			1	0	0	0	0	0	0	
		1	0	0	0	0	0	0	0	
	1	0	0	0	0	0	0	0		

0 . 0 1	one hundredth
0 . 1	one tenth
1	one
1 0	ten
1 0 0	one hundred
1 , 0 0 0	one thousand
1 0 , 0 0 0	ten thousand
1 0 0 , 0 0 0	one hundred thousand
1 , 0 0 0 , 0 0 0	one million
1 0 , 0 0 0 , 0 0 0	ten million

Bar models – multiplicative compositions of 1,000:

1,000

500500

1,000

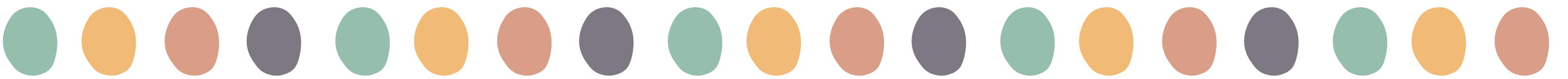
250250250250

1,000

200200200200200

1,000

100100100100100100100100

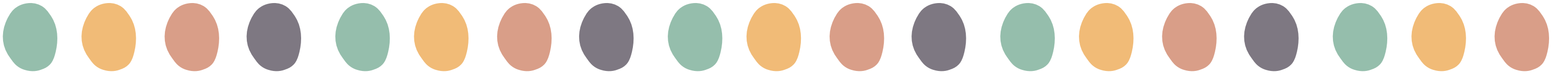


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- Number and place value
- Number facts
- Addition and subtraction
- Multiplication and division
- Fractions
- Geometry
- Other

Autumn 1	Understand place value within numbers with up to 8 digits (2 weeks)
Ready to progress	6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). 6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning. 6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. 6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
NCETM documents	TEACHING POINT 2.6 ONWARDS, TEACHING POINT 3 AND TEACHING POINT 4. https://www.ncetm.org.uk/media/sbrc5pmz/ncetm_mm_spl_y6_se30_teach.pdf#page=4
Small steps	- To determine the value of digits in numbers up to 10 million. - To compare numbers with up to eight digits. - To use knowledge of the composition of seven-digit numbers to solve problems. - To add and subtract mentally without bridging a boundary. - To add multiples of powers of 10 crossing the millions boundary. - To subtract multiples of powers of 10 crossing the millions boundary. - To explain how a seven-digit number can be composed. - To use patterns in counting sequences. - To estimate and identify numbers on number lines. - To solve problems using column addition and subtraction.
Links	NCETM SLIDES 69 TO 130 - https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2Fsptdce0j%2Fcp-year-6-unit-3-numbers-up-to-10-000-000.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/order-compare-and-calculate-with-numbers-up-to-8-digits/lessons?sid-96699a=02fchGSQLU&sm=0&src=3 WHITE ROSE https://assets.whiteroseeducation.com/new-schemes/Y6%20Autumn%20Block%201%20SOL%20Place%20value.pdf Mastery with greater depth https://www.ncetm.org.uk/media/uitjlx5g/mastery_assessment_y6.pdf
Reasoning	What Do You Notice? What do you notice when you subtract 900,000 from 1,200,000 and then subtract 90,000 from 120,000? Do, Then Explain Put these numbers in order from smallest to largest: 4,789,120 4,798,210 4,087,920 4,879,210 4,780,210 Which one is in the middle? How did you figure it out? Value of a Digit What is the value of the digit 3 in the number 73,504,912? How does its position affect its value? Make Up an Example Can you make a seven-digit number where the digit 2 is worth 200,000 and the digit 5 is worth just 5? What's one example? On the Number Line Estimate where these numbers would go on a number line marked from 0 to 10 million: 2,500,000 5,000,000 7,750,000 1,000,000 9,999,999 Which ones were trickiest to place? Build 10,000 Start at 9,980,000. Add multiples of 10,000 until you pass 10 million. What do you notice about the point when the millions digit changes? Build 100,000 How many different ways can you subtract multiples of 10,000 from 2,000,000 to reach exactly 1,700,000? Read the Scale A number line goes from 0 to 8,000,000 in steps of 1 million. A number is marked just past the 6 million mark. What might it be? How do you know?



Understand place value within numbers with up to 8 digits (2 weeks)

Problem solving



Glossary

- Million - One million is composed of one thousand thousands. $1,000 \times 1,000 = 1,000,000$ We write one million as a one followed by six zeros.
- Value - The value of a particular digit is how much that digit is worth within the given number.
- Compare - When we compare numbers, we determine whether a number is smaller than, greater than or equal to another according to similarities and differences in their values.
- Inequality - An inequality compares values and is used to show that one number is not equal to another. The symbols $<$ and $>$ are used to indicate less than ($<$) or more than ($>$).
- Partition - When we partition a value or object, we split it into smaller parts.
- Addend - An addend is a number added to another. They are also known as the parts.
- Million - One million is composed of one thousand thousands. $1,000 \times 1,000 = 1,000,000$ We write one million as a one followed by six zeros.
- Unitise - When we unitise, we treat groups that contain, or represent, the same numbers of things as 'units' or 'ones'. Being able to unitise is key in understanding place value.
- Subtrahend - The number that is to be subtracted. The second number in a subtraction.
- Sequence - A sequence is a succession of objects, diagrams or values usually formed according to a rule.
- Term - Each number in a sequence is called a term. Each term has a position - a location in the sequence.
- Estimate - When we estimate, we find a value that is close enough to the right answer, usually with some thought or calculation involved.
- Midpoint - The midpoint is the middle of something - in this case the middle of a number line. It is the point halfway along.
- Regroup - The process of unitising and exchanging between place values is known as regrouping. For example, 10 tens can be regrouped for one hundred; one hundred can be regrouped for 10 tens.

Stem sentences

The _____ represents _____
The value of the _____ is _____

Gattegno chart:

10,000,000	20,000,000	30,000,000	40,000,000	50,000,000	60,000,000	70,000,000	80,000,000	90,000,000
1,000,000	2,000,000	3,000,000	4,000,000	5,000,000	6,000,000	7,000,000	8,000,000	9,000,000
100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

Place value:
'What is the value of the red digit?'
9,378,912

Partitioning:
5,381,492

• Place-value chart

Millions			Thousands			Ones		
100s	10s	1s	100s	10s	1s	100s	10s	1s
		5	3	8	1	4	9	2

• Gattegno chart

10,000,000	20,000,000	30,000,000	40,000,000	50,000,000	60,000,000	70,000,000	80,000,000	90,000,000
1,000,000	2,000,000	3,000,000	4,000,000	5,000,000	6,000,000	7,000,000	8,000,000	9,000,000
100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

• Equation
 $5,381,492 = 5,000,000 + 300,000 + 80,000 + 1,000 + 400 + 90 + 2$

Place-value counters:
• Grouped by value and in place-value order

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

100,000 10,000 1,000

10,000 1,000

1,000

1,000

1,000

$1,000,000 + 200,000 + 30,000 + 6,000 + 10 = 1,236,010$

Part-part-whole models:

1,100

500 600

1,100 thousand

500 thousand 600 thousand

1,100,000

500,000 600,000

Number line:

+ 500,000 + 100,000

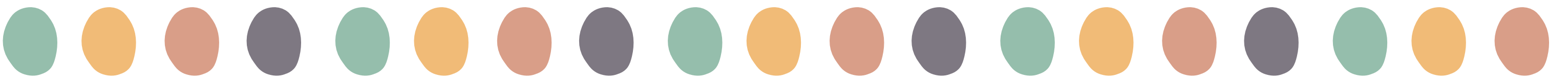
500,000 1,000,000 1,100,000

Counting:

2,402,159	2,302,159	2,202,159	2,102,159	2,002,159	1,902,159	1,802,159	...
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Representations

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Y6- Overview

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- Number and place value
- Number facts
- Addition and subtraction
- Multiplication and division
- Fractions
- Geometry
- Other

Autumn 1	Rounding and solving problems with numbers up to 7 digits (1 WEEK)
Ready to progress	6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). 6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning. 6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. 6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.
NCETM documents	TEACHING POINT 5 AND 6 https://www.ncetm.org.uk/media/sbrc5pmz/ncetm_mm_spl_y6_se30_teach.pdf#page=4
Small steps	- To round seven-digit numbers to the nearest million. - To round seven-digit numbers to any power of 10. - To explain how to solve calculations efficiently. - To explore mental and written strategies to solve problems. - To solve problems, explaining which strategy is most efficient.
Links	NCETM SLIDES 130 TO THE END-https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2Fsptdce0j%2Fcp-year-6-unit-3-numbers-up-to-10-000-000.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/rounding-and-solving-problems-with-numbers-up-to-7-digits/lessons?sid-a22f82=CLQKV5OmHd&sm=0&src=3 WHITE ROSE https://assets.whiteroseeducation.com/new-schemes/Y6%20Autumn%20Block%201%20SOL%20Place%20value.pdf Mastery with greater depth https://www.ncetm.org.uk/media/uitjlx5g/mastery_assessment_y6.pdf
Reasoning	What Do You Notice? What do you notice when you round 4,899,999 to the nearest million, hundred thousand, and ten thousand? 🧠 Do, Then Explain Which method would you use to solve 4,200,000 + 390,000? Mental or written? Why? 🔍 Value of a Digit What is the value of the 7 in 7,042,318 and how would rounding this number change if that digit were a 4 instead? 🖋️ Make Up an Example Can you create a seven-digit number that rounds to 6,000,000 when rounded to the nearest million and 6,500,000 when rounded to the nearest hundred thousand? 📍 On the Number Line If a number is between 3,000,000 and 4,000,000 and rounds to 4,000,000, what could it be? Estimate a few possible values. 🌀 Build 10,000 Start at 6,570,000. Add or subtract multiples of 10,000 to round the total to the nearest million. What's the most efficient way? 🏠 Build 100,000 What's the fewest number of steps it would take to go from 2,400,000 to 3,000,000 using only jumps of 100,000 and 200,000? 📊 Read the Scale A graph shows rounded population figures to the nearest 100,000. If the actual population is 7,841,000, what might it show on the graph—and why?

Rounding and solving problems with numbers up to 7 digits
(1 WEEK)

Problem solving

[Click on me](#)

- Glossary
- Round - When we round, we make a number simpler but keep its value close to what it was. The result is less accurate, but easier to use.
 - Midpoint - The midpoint is the middle of something, in this case the middle of two points on a number line. It is the point halfway between two things, or numbers.
 - Multiple - A multiple is result of multiplying a number by an integer.
 - Critical - Something that is critical has crucial importance.
 - Efficient - Being efficient means finding a way to solve a problem quickly whilst also maintaining accuracy.
 - Precise - Being precise is being exact. In this case, it is when numbers are given as exact values and are not rounded.
 - Difference - The difference is the result of subtracting one number from another. It is how much one number differs from another - represented by how far apart they are on a number line.
 - Subtrahend - The subtrahend is the number to be subtracted. It is the second number in a subtraction.

Stem sentences

generalisation- 'When rounding to the nearest million, the hundred thousands digit is the digit to consider. If it is four or less we round down. If it is five or more we round up.'

_____ is between and____.'

The previous multiple of one hundred thousand is _____. The next multiple of one hundred thousand is_____.

_____ is nearest to _____

_____ is_____ when rounded to the nearest one hundred thousand.'

Once children are confident rounding seven-digit numbers to the nearest 100,000, repeat the generalised statement they met in segment- 'When rounding to the nearest one hundred thousand, the ten thousands digit is the digit to consider. If it is four or less we round down. If it is five or more we round up.'

At this stage, it can be valuable to make a wider generalisation about rounding- 'When rounding to a particular degree of accuracy, the digit to the right of the place value you are rounding to is the one that determines whether to round up or down.'

If the minuend and subtrahend both decrease (or increase) by a given amount, the difference remains the same.'

Representations

Inequality:

previous
multiple of
1,000,000

2,000,000

< a <

3,000,000

next
multiple of
1,000,000

Column subtraction:

3 5 7 6 10 2 2

- 2 4 3, 6 1 0

1 1 3, 4 1 2

Column addition:

6 4 3, 8 0 1

+ 5 0 5, 3 7 0

1, 1 4 9, 1 7 1

Rounding to the nearest 1,000,000:

previous
multiple of
1,000,000

2,000,000

< 2,783,450 <

3,000,000

next
multiple of
1,000,000

5,000,000

< 5,192,012 <

6,000,000

5,000,000

< 5,811,159 <

6,000,000

7,000,000

< 7,683,102 <

8,000,000

Number line:

+1

+10,000

29,999 30,000 40,000

Bar model:

40,000

29,999 10,001

Rounding:

Here, when rounding to the nearest 1,000, the hundreds digit is the significant digit.

1 7 5 6 4 5 1

1 7 5 6 4 5 0 nearest ten

1 7 5 6 5 0 0 nearest hundred

1 7 5 6 0 0 0 nearest thousand

1 7 6 0 0 0 0 nearest ten thousand

1 8 0 0 0 0 0 nearest hundred thousand

2 0 0 0 0 0 0 nearest million