Hampshire Services
HIAS SCHOOL IMPROVEMENT

Pathway to Progress - Sample

A Mathematics Intervention Programme

Year 6

Teachers' Guide

How the programme should be delivered

Whilst the programme can be used as a stand-alone programme, it is more effective if used as a tool to securing prior learning. These sessions will support pupils securing with key concepts from the previous units plans. This knowledge will support pupils when accessing age-related work in class.

It is recommended that Year 6 interventions take place in Spring 2 to support statutory assessment at the end of the Key Stage.

If using the HIAS unit plans;

- The Number and Place Value sessions could be taught alongside unit 6.7.
- The Addition and Subtraction sessions could be taught alongside unit 6.10.
- The Multiplication and Division sessions could be taught alongside unit 6.12.

Class teachers should work closely with whoever delivers the intervention to ensure that learning is built upon effectively in class and the timings and pace match.

Number and Place Value - Overview

Learning progression	Counting- doing it daily counts!	Learning focus	Activity Cards	Resources
Session 1	Count forwards and backwards in 10,000s from any given number.	Identify, represent and estimate numbers using different representations including number lines.	• Counting Starter • I do / We do 1 • I do / We do 2 • Intelligent Practice 1 • Intelligent Practice 2 • Next Steps	• Tens frame • Place value counters (10,000) • Unstructured number line • Place value chart
Session 2	Count forwards and backwards in 100,000s from any given number.	Round any whole number to a required degree of accuracy (represent on a number line).	• Counting Starter • I do / We do • Intelligent Practice • Next Steps	• Tens frame • Place value counters (100,000) • Unstructured number line • Place value chart
Session 3	Count forwards and backwards in steps of 25 from zero.	Identify the value of each digit to three decimal places, and multiply and divide numbers by 10, where the answers are up to three decimal places.	• I do / We do 1 • I do / We do 2 • Intelligent Practice • Next Steps	• Counting stick • Hundred square • Unstructured number line • Place value chart
Session 4	Count forwards and backwards in steps of 50 from zero.	Identify the value of each digit to three decimal places and multiply and divide numbers by 100 and 1000 where the answers are up to three decimal places.	• I do / We do 1 • I do / We do 2 • Intelligent Practice 1 • Intelligent Practice 2 • Next Steps	• Counting stick • Hundred square • Unstructured number line • Place value chart

Addition and Subtraction - Overview

Learning progression	Counting- doing it daily counts!	Learning focus	Activity Cards	Resources
Session 1	Count forwards and backwards in steps of 75 from zero.	Add and subtract whole numbers with more than 4 digits (informal).	• I do / We do 1 • I do / We do 2 • Intelligent Practice 1 • Intelligent Practice 2 • Next Steps	• Counting stick • Hundred square • Unstructured number line • Dienes
Session 2	Read scales graded in different sized steps.	Perform mental calculations, including with mixed operations and large numbers.	• Counting Starter • I do / We do 1 • I do / We do 2 • Intelligent Practice • Next Steps	
Session 3	Read scales graded in different sized steps.	Solve addition multi-step problems in context, deciding which operations and methods to use and why.	• Counting Starter • I do / We do • Intelligent Practice • Next Steps	
Session 4	Count in steps of $\frac{1}{2}$ and $\frac{1}{4}$ from zero.	Solve subtraction multi-step problems in context, deciding which operations and methods to use and why.	• I do / We do 1 • I do / We do 2 • Intelligent Practice • Next Steps	• Counting stick • Unstructured number line • Semi-circles • Quarter circles

Multiplication and Division - Overview

Learning progression	Counting- doing it daily counts!	Learning focus	Activity Cards	Resources
Session 1	Count in steps of tenths from zero.	Identify common factors and common multiples.	• I do / We do • Intelligent Practice • Next Steps	• Unstructured number line • Tens frame • Place value counters (1/10) • Cubes
Session 2	Count in steps of 0.1 from zero.	Identify prime numbers.	• I do / We do • Intelligent Practice • Next Steps	• Unstructured number line • Tens frame • Place value counters (0.1) • Place value chart • Cubes
Session 3	Count in steps of 0.5 and 0.25 from zero.	Construct arrays for square numbers to show that square numbers have an odd number of factors since one is repeated.	• I do / We do • Intelligent Practice • Next Steps	• Counting • Unstructured number line • Semi-circles • Quarter circles • Cubes
Session 4	Count through zero to include negative numbers.	Solve problems involving multiplication and division, deciding which operations and methods to use and why.	• I do / We do 1 • I do / We do 2 • Intelligent Practice • Next Steps	• Unstructured number line (horizontal and vertical) • Number line including negative numbers • Thermometer image

Number and Place Value: Session 1

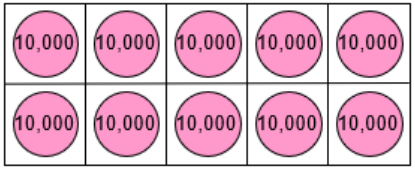
Counting Starter

Count forwards and backwards in 10,000s from any given number.

Millions			Thousands			Ones			-ths	
100s	10s	1s	100s	10s	1s	100s	10s	1s		
								0 .	0	1
								0 .	1	
								1 .		
							1	0		
						1	0	0		
					1	0	0	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		

What is the value of 1 in each column?
How does the value of the 1 increase as it moves one place to the left?

The 1 becomes 10 times the size as it moves one place to the left.
E.g. 10,000 is ten times the size of 1000.



Count in steps of 10,000 from 0.
How many steps did you count?
How many ten thousands are equivalent to 100,000?
How do you know?

10 ten thousands are equivalent to 100,000.

Key Questions

- I'm going to start to count now, and I want you to carry on when I stop "0, 10,000, 20,000…"; "100,000, 90,000, 80,000….".
- I'm going to start to count now, and I want you to carry on when I stop "3, 10,003, 20,003…"; "105,070, 95,070, 85,070….".
- What changes and what stays the same?

Main Learning Focus

Identify, represent and estimate numbers using different representations including number lines.

Previous Experience

- Recognise the place value of each digit in numbers with units from thousands to hundredths, and compose and decompose these numbers using standard and non-standard partitioning.
- Reason about the location of numbers between 0.01 and 9,999 in the linear number system.

Verbal Coding and Stem Sentences

The previous multiple of _____ is ___.

The next multiple of ___ is ___.

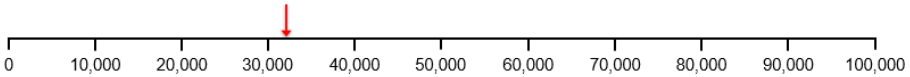
The unlabelled half-way point is ___.

Watch Out For

- Misunderstanding zero as a place holder.
- Lack of fluency when reading numbers from words or numerals indicating weak place value understanding.

Number and Place Value: Session 1

I do - Adult Modelling



I know that each interval on the number line increases by 10,000.

Looking at the red arrow, the previous multiple of 10,000 is 30,000.

The next multiple of 10,000 is 40,000.

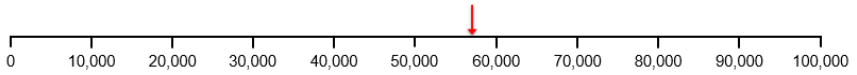
The red arrow is closest to 30,000.

The red arrow is before the unlabelled half-way point, between the 30,000 and 40,000 is 35,000.

The value of the red arrow would be between 30,000 and 35,000.

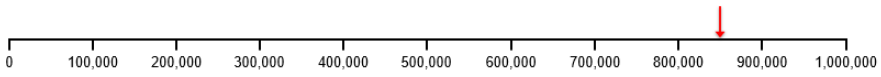
I estimate that the value of the red arrow is 32,000.

We do: Paired Example



- What does each interval on the number line increase by?
- Which multiples of ten thousand is the arrow in between?
- Which multiple is it closest to?
- Is it before or after the unlabelled half-way point between the two known values?
- What number do you estimate the arrow is pointing to?

I do - Adult Modelling



I know that each interval on the number line increases by 100,000.

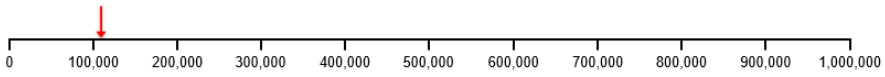
Looking at the red arrow, the previous multiple of 100,000 is 800,000.

The next multiple of 100,000 is 900,000.

The red arrow is pointing to the unlabelled half-way point between the 800,000 and 900,000.

I estimate that the value of the red arrow is 850,000.

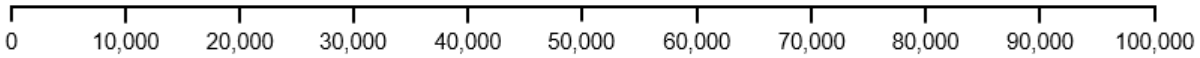
We do: Paired Example



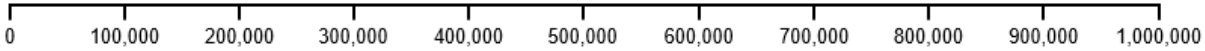
- What does each interval on the number line increase by?
- What number do you estimate the arrow is pointing to?
- What information helped your estimate?

Number and Place Value: Session 1

You do: Intelligent Practice



- Where would 4,000 be located?
- 14,000?
- 74,000?
- How do you know? What information helped your estimates?



- Where would 225,000 be located?
- 525,000?
- 775,000?
- 375,000?
- How do you know? What information helped your estimates?

The previous multiple of ____ is ___.

The next multiple of ___ is ___.

The unlabelled half-way point is ___.

Assessment Opportunities

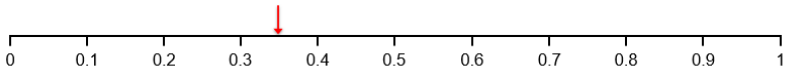
- Check pupils are able to identify the previous and next multiples of 10,000 and 100,000.
- Check pupils are able to identify the half-way point between two multiples of 10,000 and 100,000.
- Check pupils are able to identify quarter and three-quarter points on the number line?
- Check pupils ability to reason and explain mathematical thinking.

Next Steps

What number is the red arrow pointed at?

How do you know?

What information helped you with your estimate?

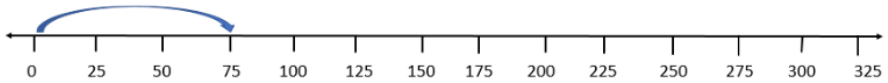


Addition and Subtraction: Session 1

Counting Starter

Count in steps of 75 from zero.

Use a hundred square and a number line to support counting in steps of 75.



Move to a counting stick to practise counting in steps of 75 reliably from zero, forwards and backwards

Key Questions

- How far can you count in steps of 75, starting from 0? Show me.
- I'm going to start to count now, and I want you to carry on when I stop "0, 75, 150…"; "300, 225…".
- What patterns do you notice?

Main Learning Focus

Add and subtract whole numbers with more than 4-digits.

Previous Experience

Apply all mental strategies to addition and subtraction using 4-digit whole numbers.

[Year 4].

Verbal Coding and Stem Sentences

- Partition and recombine
- Round and adjust
- Efficient mental strategies
- Inverse operations

Watch Out For

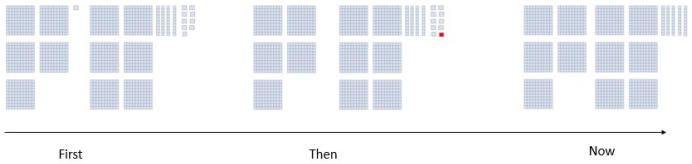
- Pupils who are not secure with place value knowledge and can not represent numbers using concrete resources.
- Pupils who resort to formal written methods.

Addition and Subtraction: Session 1

I do - Adult Modelling

1150 + 501 + 649 =

I notice that I can partition and recombine 501 and 649 so that I can add mentally.



500 + 650 = 1150
1150 + 1150 = 2300

1150 + 501 + 649 = 2300

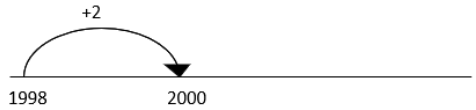
We do: Paired Example

1350 + 499 + 601 =

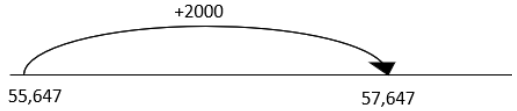
- What do you notice about the numbers?
- Can you partition and recombine using concrete resources?
- How could you check your answer?

I do - Adult Modelling

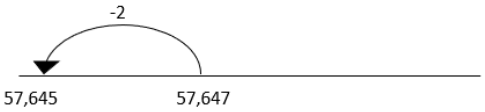
55,647 + 1998 =



I will round 1998 to the nearest thousand by adding 2.



I will add 2000 to 55,647.
I only need to change the digit in the thousands column (5).



I will adjust my answer of 57,647 by subtracting the 2 I rounded up by.

55,647 + 1998 = 57,645

We do: Paired Example

46,063 + 1998 =

- What do you need to add to 1998 to round it to the nearest thousand?
- Which column will change when you add 2000?
- What do you need to adjust your answer by? Why?
- How could you check your answer?

Addition and Subtraction: Session 1

You do: Intelligent Practice

Partition and Recombining

1025 + 301 + 479 =

1025 + 201 + 479 =

1025 + 101 + 579 =

- Can you partition and recombine using concrete resources?
- What patterns do you notice?
- How could you check your answer?

Rounding and Adjusting

31,649 + 1998 =

31,649 + 1997 =

31,649 + 2997 =

- What do you need to add to each four digit number to round to the nearest thousand?
- What do you need to adjust your answer by? Why?
- How could you check your answer?

Assessment Opportunities

- Check for pupils are able to apply mental strategies of whole number with more than 4-digits, including:
  - ⇒ Using known facts and related facts
  - ⇒ Rounding and adjusting
  - ⇒ Partitioning and recombining
  - ⇒ Using doubles/halves/near doubles
  - ⇒ Using approximation to estimate an answer

Next Steps

How would you solve this?

Which strategy is the most efficient?

55,005 + 1999 =