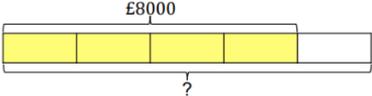
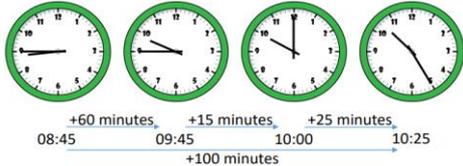


Unit Overview: Developing Numbers								
Half- Term:	AUT 1	AUT 2	SPR 1	SPR 2	SUM 1	SUM 2	No of Lessons:	24
<p>Key Focus for Unit: What is the key knowledge being delivered? What is the intent of this unit?</p> <p><u>Weeks 1 and 2: Fractions & Percentages</u> This block focuses on the relationships between fractions and percentages, including decimal equivalents, and using these to work out percentage increase and decrease. Students also explore expressing one number as a fraction and percentage of another. Both calculator and non-calculator methods are developed throughout to support students to choose efficient methods. Financial maths is developed through the contexts of e.g. profit, loss and interest. The higher strand also looks at finding the original value given a percentage or after a percentage change.</p> <p><u>Weeks 3 and 4: Standard Index Form</u> Higher strand students have already briefly looked at standard form in year 7 and now this knowledge is introduced to all students, building from their earlier work on indices last term. The use of context is important to help students make sense of the need for the notation and its uses. The higher strand includes a basic introduction to negative and fractional indices.</p> <p><u>Weeks 5 and 6: Number Sense</u> This block provides a timely opportunity to revisit a lot of basic skills in a wide variety of contexts. Estimation is a key focus and the use of mental strategies will therefore be embedded throughout. We will also use conversion of metric units to revisit multiplying and dividing by 10, 100 and 1000 in context. The higher strand will extend this to look at the conversion of area and volume units, as well as having an extra step on the use of error notation. We also look explicitly at solving problems using the time and calendar as this area is sometimes neglected leaving gaps in student knowledge.</p>								
<p>Key: MASTERY – The skills and knowledge we want all our students to master and recall quickly. SECURE – The skills and knowledge that we will need to return to regularly and interleave in order for our middle and lower attaining students to secure mastery or for which they might struggle. DEVELOPING – The skills and knowledge that we will use to stretch and challenge our most abled students.</p>								
<p><u>Fractions & Percentages:</u> <u>Converting between FDP (Mastery)</u></p> <ul style="list-style-type: none"> Convert fluently between FDP with and without a calculator (R) Calculate fractions, decimals and percentages of an amount using calculator methods (R) <p><u>Multiplicative Change</u></p> <ul style="list-style-type: none"> Calculate percentage increase and decrease with and without a multiplier Express one number as a fraction or a percentage of another with and without a calculator Work with percentage change Choose appropriate methods to solve percentage problems 			<p><u>Standard Form:</u> <u>Working with powers of 10</u></p> <ul style="list-style-type: none"> Convert between ordinary and standard form Compare and order numbers in standard form <p><u>Operations with standard form</u></p> <ul style="list-style-type: none"> Mentally calculate with numbers in standard form Use four operations in standard form, with and without a calculator Understand and use negative and fractional indices (H) 			<p><u>Number Sense:</u> <u>Rounding and error intervals</u></p> <ul style="list-style-type: none"> Round numbers to a given number of decimal places and significant figures Estimate the answer to a calculation Understand and use error interval notation (H) <p><u>Conversion of units</u></p> <ul style="list-style-type: none"> Calculate using the order of operations (R) Calculate with money Convert metric measures of length Convert metric units of weight and capacity Convert metric units of area (H) Convert metric units of volume (H) 		

<p>Reverse Percentage</p> <ul style="list-style-type: none"> Find the original amount given the percentage more than or less than 100% (H) Choose appropriate methods to solve complex percentage problems (H) 		<ul style="list-style-type: none"> Solve problems involving time and the calendar 														
<p>Scaffolded Guidance:</p> <ul style="list-style-type: none"> Use of Bar Models  <ul style="list-style-type: none"> Highlight links between key proportions (1 fifth = 0.2) <p>Stretch Guidance:</p> <ul style="list-style-type: none"> Use of DVI (e.g. revenue) mixed with FDP Compound reverse percentages <p>Dora invests some money into a savings account that pays 4% interest every year. After five years Dora's investment is worth £5000.</p>	<p>Scaffolded Guidance:</p> <ul style="list-style-type: none"> Place Value Chart <table border="1"> <thead> <tr> <th>Millions</th> <th>Hundred thousands</th> <th>Ten thousands</th> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td>10^6</td> <td>10^5</td> <td>10^4</td> <td>10^3</td> <td>10^2</td> <td>10^1</td> <td>10^0</td> </tr> </tbody> </table> <p>Stretch Guidance:</p> <ul style="list-style-type: none"> Combining into other topics (e.g. Area of a shape) or link with other subjects (e.g. science) Explore law of indices and establish link 	Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones	10^6	10^5	10^4	10^3	10^2	10^1	10^0	<p>Scaffolded Guidance:</p> <ul style="list-style-type: none"> Use of number lines to visualise closer to 9 or 0 (through place values) Use of analogue clocks  <p>Stretch Guidance:</p> <ul style="list-style-type: none"> Comparing accuracy of measures, investigating upper and lower estimate (e.g. $£3.76 \times £0.65$ is more accurate than $£4 \times £0.7$)
Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones										
10^6	10^5	10^4	10^3	10^2	10^1	10^0										

Key Knowledge and Big Ideas:

What **Powerful Knowledge** and **Big Ideas** are explored in this Unit?

How have these progressed from previous learning? What **gaps in knowledge** have you identified from **baselining** and how are they being closed?

BIG IDEAS:

Number, Algebra

Powerful Knowledge:

- How to convert between fractions, decimals and percentages
- Work with percentages greater than 100
- Express one number as a fraction or percentage of another
- Increase and decrease by a given percentage
- Find the original number given the result of a percentage change
- Work out percentage change
- Work with large numbers in standard form
- Work with decimal numbers in standard form
- Compare numbers in standard form
- Use standard form in real life contexts (with/without calculator)
- Round numbers to given number of significant figures
- Solve problems with money
- Difference between significant figures and decimal places
- Convert Metric units
- Perform calculations involving time
- Convert units of area and volume
- Work with calendars

Previous Learning:

- Positive and negative integers in the form of $\times 10^n$
- Write 10, 100, 1000 etc as 10^n
- Write decimals in form $a \times 10^n$
- Add and subtract numbers in standard form
- Rounding to decimal places and significant figures
- Convert between fractions, decimals and percentages

Gaps in Knowledge and Misconceptions:

- What standard form is $A \times 10^n$
- Standard FDP conversions $\frac{1}{4} = 0.4$
- Multiplying fractions $\frac{3}{5} \times 2 \rightarrow \frac{6}{10}$

Unit Assessment:

How will this unit be assessed?

What is the frequency of assessments – baselines etc?

<p>How will this unit be assessed?</p> <ul style="list-style-type: none"> • Baseline Testing with EOB A or similar at start • End of Block Assessment with EOB B at end 	<p>Main Topics Covered in assessments</p> <ul style="list-style-type: none"> • Convert between fractions, decimals and percentages • Percentage of an amount • Express one number as a percentage of another • Percentage loss and profit (VAT) • Writing numbers as powers of 10 • Convert from standard form to ordinary form (and vice versa) • Operations in standard form (addition and multiplication) • Rounding to nearest integer, to decimal places, and to significant figures • Convert between units • Solve Money Problems • Error Intervals 	
<p><u>Retrieval Practice:</u></p> <ul style="list-style-type: none"> • T/F Retrieval starter • Homework tasks • Formula Quiz • Timetable Quiz • 	<p><u>Key Retrieval Topics (Interleaving):</u></p> <ul style="list-style-type: none"> • Problem solving with FDP • Problem solving with indices and standard Form • Problem solving with rounding and estimation 	
<p><u>Key Skills Explored</u></p> <ul style="list-style-type: none"> • Fractions • Decimals • Percentages • Standard Form • Ordinary Form • Metric Conversions 	<p><u>Vocabulary Selected for DVI</u></p> <ul style="list-style-type: none"> • Fraction • Decimals • Percentage • Equivalent • Denominator • Numerator • Rounding • Conversion • Power / Index / Exponent • Base • Place Value 	<p><u>Links to Previous Unit</u></p> <ul style="list-style-type: none"> • Multiplying and dividing fractions • Percentage of an amount • Fraction of an amount • Decimal to fraction • Percentage to decimal • Percentage to fraction
<p><u>Links to Careers/Employability</u></p>	<p><u>How does this unit prepare students for the next unit?</u></p>	
<ul style="list-style-type: none"> • Bank Statement • Bills • Mortgages • Understanding Money 	<ul style="list-style-type: none"> • Multiplying Decimals • Conversion of units • More difficult standard form • Problem solving in standard form • Multiplying and dividing in standard • Law of Indices • Scale Diagrams 	