

# KESTEVEN AND SLEAFORD HIGH SCHOOL

## Mathematics Scheme of Learning Year 7 – Term 5-FDP/Statistics/Proportion

### Intent – Rationale

This term there is a focus on improving students' confidence in working between different forms of expressing non-integer values to use in varying contexts. They will need to understand their place value to use in the statistics topic which follows.

Year 7 have an awareness of averages from Key Stage 2 but will develop their knowledge of appropriate applications of the different measures and how to compare. Using their improved understanding of fractions student will be able to express amounts as a fraction of a whole and progress to expressing as a ratio. Proportion is an important foundation to many mathematical topics

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
<ul style="list-style-type: none"><li>• KS2 pupils will be able to simplify fractions and convert fractions to be in comparable denominators</li><li>• KS2 pupils will be able to compare and order fractions, including fractions <math>&gt;1</math></li><li>• KS2 pupils will be able to add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</li><li>• KS2 pupils will be able to multiply simple pairs of proper fractions, writing the answer simplest form</li><li>• KS2 pupils will be able to divide proper fractions by whole numbers</li><li>• KS2 pupils will be able to convert between simple fractions, decimals and percentages</li><li>• KS2 pupils will be able to multiply and divide one-digit numbers with up to two decimal places</li><li>• KS2 pupils will be able to interpret and construct pie charts and line graphs and use these to solve problems</li><li>• KS2 pupils will be able to calculate and interpret the mean as an average.</li><li>• KS2 pupils will be able to solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</li></ul>	<ul style="list-style-type: none"><li>• Year 8 Term 1 use of decimals in area and perimeter calculations, Term 2 fraction calculations, Term 3 percentage increase/decrease.</li><li>• Year 8 Term 2 statistics, averages from a frequency table</li><li>• Year 8 Term 2 proportion</li></ul>

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<ul style="list-style-type: none"> <li>KS2 pupils will be able to solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</li> </ul>	
What are the links with other subjects in the curriculum?	What are the links to SMSC, British Values and Careers?
<p>Design and Technology:</p> <ul style="list-style-type: none"> <li>Use ratios, fractions and percentages - Scaling drawings, analysing responses to user questionnaires.</li> <li>Presentation of data, diagrams and bar charts - Construct and interpret frequency tables; present information on design decisions.</li> </ul> <p>Business</p> <ul style="list-style-type: none"> <li>Percentages</li> <li>Average rate of return</li> <li>Profitability ratios (gross profit margin and net profit margin)</li> </ul> <p>Geography</p> <ul style="list-style-type: none"> <li>Select and construct appropriate graphs and charts to present data e.g. pie charts</li> <li>Understand and correctly use proportion and ratio, magnitude and frequency</li> <li>Use appropriate measures of central tendency and spread (median, mean, range, mode and modal class)</li> </ul>	<ul style="list-style-type: none"> <li>C2 - Equivalence of fractions, decimals and percentages and the validity of comparisons between them. Link to Food nutrition labelling and healthy eating.</li> <li>GB4e - Solving real life problems, a chance to put new skills in to context and reflect on how mathematics is relevant to everyday life</li> <li>GB4e - Use of statistics as a way of measuring and making sense of the world around us.</li> <li>GB4e - Comparing data sets, using statistical data to make judgements</li> </ul>
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	What are the opportunities for developing mathematical skills?

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## **The Number Devil by Hans Magnus Enzensberger**

*Age 11+*

The quirky and unusual story of a young boy who hates maths at school, but who discovers a new side to the subject when he meets an unusual mathematician in a dream. This book takes you on an adventure through creative mathematical thinking, with great illustrations along the way.

- Place value problems with values in mixed forms
- Students calculate averages of relevant data or from data they have collected.
- Proportion vs ratio, identifying language used

## **Mathematics Scheme of Learning**

### **Year 7 – Term 5**

#### **Intent – Concepts**

**What knowledge will students gain and what skills will they develop as a consequence of this topic?**

#### **Know**

Convert between fractions, decimals and percentages, and know basic FDP conversions ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{1}{10}$ ). Find a fraction of an amount. Find a percentage of an amount (non- calculator method). Calculate simple percentage increase/decrease.

Identify the mode from raw data and a frequency table. Find the median and range of raw data. Find the mean of raw data. Know the difference between discrete and continuous data. Draw and interpret a bar/line chart and a pie chart.

Explain what is meant by proportion and ratio. Represent amount as a proportion and as a ratio, including three part ratios. Express a ratio in its simplest form, including three part ratios.

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## Apply

Solve worded problems finding fractions/percentages of amounts. Use finding a fraction of an amount knowledge to calculate angles to draw in a pie chart.

Begin to make conclusion statement using averages to justify

Calculate the frequency when given an angle which is a factor of 360 in a pie chart

Create a ratio from a worded problem.

## Extend

Best buys – compare offers for fraction and percentage of amounts off.

Compare data sets and justify conclusions using averages. Calculate the frequency when given any angle in a pie chart

Solve worded problems using proportion and ratio.

Find missing parts of ratios given information on other parts.

**What subject specific language will be used and developed in this topic?**

**What opportunities are available for assessing the progress of students?**

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<ul style="list-style-type: none"> <li>Fraction, decimal, percentage, conversion, improper fraction, mixed number, remainder, increase, decrease, depreciate, interest, mode, median, range, mean, raw data, tally, discrete, continuous, bar chart, pie chart, angle, protractor, proportion, ratio, simplest form, part, express</li> </ul>	<ul style="list-style-type: none"> <li>Retrieval homework issued termly followed by teacher www/ebi comments with a week built in for pupils to digest and follow up on feedback. A termly assessment will follow on from this with year group 'topic top up' identified in preparation for next term's teaching.</li> <li>Formative assessment occurs throughout lessons and will address, although not be limited to, the following common misconceptions:               <ul style="list-style-type: none"> <li>Assumption that <math>1/20=0.2=20\%</math></li> <li>Percentage 'of' vs percentage increase/decrease</li> <li>Confusion between mean, median and mode</li> <li>Not leaving gaps between bars on a bar chart</li> <li>Ratio vs proportion</li> <li>Keeping ratio in the same order as the wording of the question</li> </ul> </li> </ul>
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Fractions, Decimals & %	R	A	G
Convert between fractions, decimals and percentages			
Recall basic FDP conversions: $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{5}$ , $\frac{1}{10}$			
Find a fraction of an amount			
Find a percentage of an amount (non-calculator method)			
Calculate simple percentage increase/decrease			

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<b>Statistics</b>	<b>R</b>	<b>A</b>	<b>G</b>
Identify the mode from raw data and a frequency table			
Find the median and range of raw data			
Find the mean of raw data			
Know the difference between discrete and continuous data			
Draw a bar chart/line chart			
Draw and interpret a pie chart for given proportions			

<b>Proportion</b>	<b>R</b>	<b>A</b>	<b>G</b>
Explain what is meant by proportion and what is meant by ratio			
Represent amounts as a proportion			
Form a ratio			
Express a ratio in its simplest form			