# KESTEVEN AND SLEAFORD HIGH SCHOOL

## Mathematics Scheme of Learning
## Year 9 – Term 4/Graphs/Decimals/Statistical Charts/Constructions

**Intent – Rationale**

Students revisit topics taught in Year 8 and extend to link together topics and language used across mathematics to prepare for GCSE applications.

| Sequencing – what prior learning does this topic build upon? | Sequencing – what subsequent learning does this topic feed into? |
|---|---|
| • Year 8 term 2 identifying y intercept and gradient from a linear equation in the form y=mx +c, term 2 HAP identified gradient relationships for parallel and perpendicular lines<br>• Year 7/8 converting terminating decimals to fractions knowledge, Year 8 Term 1 product of prime factors.<br>• Year 8 term 2 mean from an ungrouped frequency table<br>• Year 8 term 6 congruency conditions are studied, Year 8 term 4 construct angle and perpendicular bisectors, Year 8 term 4 basic constructions (HSL on congruency some construction covered before lockdown as part of Loci) | • GCSE show geometrical relationships are present, use geometrical relationships to find coordinates and equation of a line<br>• Prove algebraically recurring decimal is equivalent to fraction given.<br>• GCSE estimate from a cumulative frequency diagram, draw a box plot, compare distributions<br>• GCSE Loci problems including scale drawings and bearings |
| **What are the links with other subjects in the curriculum?** | **What are the links to SMSC, British Values and Careers?** |
| Art and Design and Technology<br>• Scale factor for scale drawings<br>• Construction strand of shape, measures and space<br>Geography<br>• Coordinates and working on scales<br>• Collecting, representing and interpreting data<br>History | • SMSC(SO) - The use of graphs in political and business context<br>• GB4d)e)d)g)l) |

| | |
|---|---|
| • Handling, representing and interpreting data<br>ICT<br>• Graph plotting<br>PE<br>• Performance data<br>• Mean, mode, median and range<br>RE<br>• Interpreting data<br>Science<br>• Continuous and discrete data<br>• Types of graph<br>• FDP<br>• Indices<br>• Forming and solving equations | |
| **What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?** | **What are the opportunities for developing mathematical skills?** |
| • The Future Architect's Book - Barbara Beck | • Recognising how business' can use statistical representations to mislead their audience<br>• Use data relevant to students to analyse<br>• Improve accuracy and use of mathematical equipment |

# Mathematics Scheme of Learning
# Year 9 – Term 4

## Intent – Concepts

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

## National Curriculum Programme of Study Reference:

Work with coordinates in all four quadrants, recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane, interpret mathematical relationships both algebraically and graphically. reduce a given linear equation in 2 variables to the standard form y = mx + c; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically.

Work interchangeably with terminating decimals and their corresponding fractions (such as $\frac{7}{2}$ and 3.5 or 0.375 and $\frac{3}{8}$)

Identify and construct congruent triangles, apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, draw and measure line segments and angles in geometric figures, including interpreting scale drawings, derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line

**Know**

Identify gradient and y intercept from an equation. Identify parallel and perpendicular lines from equations. Draw a straight- line graph using the gradient method.

Identify a recurring decimal from fraction form. Convert simple recurring decimals to fractions

Criticise a questionnaire, identifying bias and mathematical accuracy. Identify the median, mode and mean from a (grouped) frequency table. Draw a cumulative frequency diagram. Draw a frequency polygon.

Construct a 30/60/90-degree angle. Construct a perpendicular bisector from a given point. Draw and measure a bearing

**Apply**

Find the equation of a parallel line when given (0,c)

Find the median and interquartile range from a cumulative frequency diagram

Create a compound shape using constructions

Draw scale diagrams using constructions and bearings

**Extend**

Find the equation of parallel and perpendicular lines. Solve simultaneous equations graphically.

Convert any recurring decimal to a fraction

Compare distributions using cumulative frequency diagrams

Solve loci problems

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| What subject specific language will be used and developed in this topic? | What opportunities are available for assessing the progress of students? |
|---|---|
| Construct, bisect, geometrical relationship, parallel, perpendicular, interquartile range, upper quartile, lower quartile, distribution, recurring, terminating, simultaneous, bearing, cumulative, frequency, locus/loci. | • Year 9 Assessment week – students complete foundation GCSE papers to show they are ready for higher tier GCSE content<br>• Create a construction picture – a good homework<br>• Mini whiteboards for quick parallel/perpendicular gradient<br>• Multiple choice questions for identifying fraction equivalent to given recurring decimals |

| **Graphs** | R | A | G |
|---|---|---|---|
| Identify the gradient and y intercept from an equation of a straight line | | | |
| Identify parallel and perpendicular lines from equations | | | |
| Find the equation of a parallel line when given (0,c) | | | |
| Draw straight line graph using gradient method | | | |
| Solve simultaneous equations graphically | | | |

| **Decimals** | R | A | G |
|---|---|---|---|
| Identify a recurring decimal from fraction form. | | | |
| Convert simple recurring decimals to fraction | | | |

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| **Statistical Charts** | R | A | G |
|---|---|---|---|
| Criticise a questionnaire | | | |
| Identify the median, mode and mean from a (grouped) frequency table | | | |
| Draw a cumulative frequency diagram | | | |
| Draw a frequency polygon | | | |

| **Constructions** | R | A | G |
|---|---|---|---|
| Construct an angle bisector | | | |
| Construct a perpendicular bisector | | | |
| Construct a perpendicular bisector from a given point | | | |
| Construct a 30/60/90 degree angle | | | |
| Draw and measure a bearing | | | |

## Intent – Concepts

| Lesson title | Learning challenge | Higher level challenge | Suggested activities and resources |
|---|---|---|---|
| Straight Line Graphs | Identify gradient and y intercept from an equation. | Find the equation of a parallel line when given (0,c) | NBE Y9 Straight Line Graphs PPT |

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|---|---|---|---|
| | Identify parallel and perpendicular lines from equations | Solve simultaneous equations graphically<br>Find area of shapes created by multiple straight lines | |
| | Draw a straight line graph using the gradient method | | |
| Decimals | Identify a recurring decimal from fraction form using prime factors. | Convert any recurring decimal to fraction.<br>Complete simple arithmetic questions with recurring decimals | NBE Y9 Decimals PPT |
| | Convert simple recurring decimals to fraction | | |
| Statistical Charts | Criticise a questionnaire, identifying bias and mathematical accuracy. | Compare distributions using cumulative frequency diagrams | NBE Y9 Statistical Charts PPT |
| | Identify the median, mode and mean from a (grouped) frequency table. | | |
| | Draw a cumulative frequency diagram. | | |
| | Draw a frequency polygon | | |
| Constructions | Construct a 30/60/90 degree angle. | Solve loci problems<br>Area problems with loci questions | NBE Y9 Constructions PPT<br>Construction step by step worksheet |
| | Construct a perpendicular bisector from a given point. | | |
| | Draw and measure a bearing | | |