



Year Group: **Year 10**

This is the plan for the taught curriculum during achievement period: **Three (May-Jul)**

#### **Brief summary of the topic/work being covered during this period**

In Key Stage 4 we work from a linear scheme of work, with differentiated objectives that allow teachers to tailor learning to the abilities of their class, rather than labelling classes as “higher” or “foundation” at this early stage in their Key Stage 4 education. This section gives a brief overview of work covered, with each point being given support/challenge as required for the particular group.

##### **Substantive knowledge**

- Key angles facts (straight line, point, triangle, quadrilateral)
- The addition and product law for probability

##### **Disciplinary knowledge**

- Recognise, categorise and estimate different sizes of angles.
- Find missing angles formed between parallel lines.
- Find exterior and interior angles of polygons.
- Identify and use circle theorems.
- Draw and interpret bar charts, pie charts, frequency polygons, cumulative frequency curves and histograms. Use them to analyse, discuss and compare data sets.
- Draw and interpret scatter graphs and time series graphs, including making estimates from them, whilst understanding their limitations.
- Understand how to describe the probability of events using words and numbers.
- Use tables and grids to list the outcomes of simple combinations of events. Use the product rule for counting.
- Use the addition law for mutually exclusive events. Use the product law for finding the probability of combined events.
- Use tree diagrams and Venn diagrams to represent situations and find probabilities.

#### **Prior knowledge needed for this unit/topic from previous teaching**

Different students will have different starting points, depending on their understanding of mathematics in previous years. However, the list below outlines the basics that all students need to know before starting. Teachers will assess their own classes at the start of each topic to determine the group's starting point.

- Recognise acute/obtuse/reflex angles. Know that a “full turn” is  $360^\circ$  and a “half turn” is  $180^\circ$ . Be familiar with the basic angle rules (at this stage students should be applying them to more complex problems).
- Recognise sets of parallel lines; identify them within shapes.
- Know the definition of a polygon. Recognise regular polygons and be able to name shapes up to those with 10 sides.
- Know the basic parts of a circle.
- Recognise and interpret simple bar charts (at this stage, questions will include compound and dual charts). Know that angles that form a circle sum to  $360^\circ$ . Know that graphs and diagrams should be drawn in pencil, using a ruler, and that they should have clearly labelled axes and a title.
- Be able to read and plot coordinates.
- Be familiar with a probability scale and the descriptive words of probability. Confident adding, subtracting and multiplying fractions and decimals, with and without a calculator.
- Know how to complete a two-way table. Be able to multiply numbers easily with and without a calculator.
- Add, subtract, multiply and divide fractions and decimals with and without a calculator.

#### **Rationale for students studying this unit/topic**

Angle rules could be placed in any part of the Key Stage 4 curriculum; however, there are other more challenging topic areas that are better suited to year 11 when students have a bit more maturity. At a higher level, they have already met algebraic proof and so are able to tackle the geometric proofs more easily.

Towards the end of year 10, students have much more experience of the Key Stage 4 style of questioning and assessment, and are therefore academically mature enough to tackle the more challenging data handling topics and probability.

**Key concepts/ideas that are taught to students in this unit/topic, including any anticipated gaps in knowledge and plan to overcome these**

- Students should be taught to apply their skills to open-ended and problem-solving situations to ensure they have fully mastered a skill. This applies to students at all levels, and for all topic areas.
- Students also need to be able to use their calculators effectively – it is widely acknowledged that students do not fully appreciate the functions that calculators have and how to use these efficiently. Students will be encouraged to use non-calculator and calculator methods at all parts of their learning.
- Students often struggle to remember the different angle rules and circle theorems. Emphasis and time should be placed on the learning of these well and a deep understanding before answering too many exam-style questions.
- Students often struggle with concepts of probability, so it is worth spending time at the start of the topic really embedding ideas of chance, before introducing the more mathematically challenging concepts.

**New key terminology students will be taught during this topic/unit**

**Tier 3**

All terminology associated with angles in parallel lines; alternate, corresponding, co-interior/supplementary; all terminology associated with circle theorems; segment, tangent, alternate, etc. Histograms, Cumulative Frequency, Frequency Density.

**Plan for Assessment**

- Informal assessment is ongoing through class work, contributions to class discussion, teacher assessment during lessons.
- Teachers record homework marks each week on a centrally held department tracker; the homework tasks are detailed on the schemes of work and outlined centrally within the department to ensure consistency across all classes. Teachers will take in and formally mark a written piece of homework once every two weeks. Students will then have time during a subsequent lesson to review their work and make any corrections.
- Formal assessment will take place once during this achievement period; towards the end of the academic year, during the whole school mock period. Students will complete three papers, to replicate the end of year 11 exam structure, but the papers will be heavily edited and reduced to only one hour each, removing all content yet to be taught. As with all other assessments, the papers will be synoptic and will assess students' progress in mathematics generally, covering questions from all topics that have been covered at any point in the students' mathematical history (not just this academic year).
- Mini start-of-topic tests provide information for teachers regarding prior knowledge and existing misconceptions and mini end-of-topic tests help students and teachers see the progress that has been made over the course of the teaching of the topic.