



Year Group: **Year 10**

This is the plan for the taught curriculum during achievement period: **One (Sept-Dec)**

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

- Recall the first 15 square numbers and the first 10 cube numbers
- Identify prime numbers less than 50.
- Understand different sampling techniques.

Disciplinary knowledge

- Find the Prime Factor Decomposition of a number
- Find the Highest Common Factor and Lowest Common Multiple of two numbers
- Simplify fractions, convert between mixed numbers and improper fractions, compare and order fractions, add, subtract, multiply and divide fractions.
- Know simple FDP conversions and know methods to convert between other fractions, decimals and percentages.
- Order integers, decimals, fractions and percentages.
- Calculate percentages of amounts, percentage increases and decreases, and the original amount after a percentage change.
- Express a number as a percentage of another and find the percentage change in a range of contexts.
- Expand brackets and simplify algebraic expressions.
- Factorise algebraic expressions and use to help with algebraic manipulation and simplification.
- Calculate averages and measures of spread, for data given in lists and in tables.
- Make comparisons using summary statistics.

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.

- Multiplication facts and understanding of key terminology: square, cube, prime, etc.
- Find factor pairs of a number and identify prime numbers; knowledge of writing numerical expressions using indices.
- Understanding of key terminology; multiple, factor, common.
- Understanding of fractions as a part of a number and an understanding of the size of unit fractions.
- Convert between fractions, decimals and percentages
- Understanding of percent meaning "per hundred" and that $100\% = 1$
- Write one number as a fraction of another number; convert fractions to percentages.
- Know how to add, subtract, multiply and divide algebraic terms.
- Understand the meaning of random and understand methods of selecting items randomly from a group.
- Know the difference between mean, mode, median and range.

Rationale for students studying this unit/topic

Fractions, decimals and percentages are some of the most important concepts to master in mathematics, and they can be found in calculations across all strands. Likewise with factors, multiples and primes. It is important to have a good understanding of these embedded early in Key Stage 4 so that students can continue to work on the techniques developing their fluency throughout the course, and also be able to tackle future topics that involve prior knowledge of these strategies.

It is important that students have experience analysing data at regular points throughout the Key Stage 4 course, so meeting some statistical interpretation techniques at the beginning of year 10 will allow them to develop their analytical thinking early, which can then be developed over the course of the two years. Traditionally the more “wordy” responses required to questions in this topic are not answered well, so learning the ideas soon means students will regularly revisit exam-style questions during assessment periods, and hone their exam technique over a longer period of time.

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 to ensure they are confident in their use of calculators prior to moving onto skills that are more complex later. In particular, entering mixed numbers into calculators causes problems for lots of students and needs attention during learning.
- Students regularly mix up factor and multiple, even at this level; frequently giving a factor instead during a “Lowest common multiple” question. This is a key skill and so adequate time must be given to ensure students have mastered this idea.
- Students regularly calculate the range alongside mean, median and mode, which means they often incorrectly think the range is an average, rather than a measure of spread. Adequate time must be given to explaining and discussing the differences here, as well as allowing students a real and deep understanding of the concept of an “average” value, rather than just following a list of steps in a calculation.

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

Tier 3

Some students will need to be reminded of terminology such as “multiplier” “factor” “multiple”. Emphasis should be placed on learning the difference between “average” and “range” – too often students think the range is a form of average rather than a measure of spread. There will be lots of new terminology when learning about Sampling; stratified, random, census, population, etc.

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 twice during this achievement period; firstly a baseline assessment at the start of the year, than a synoptic paper after October half term. This will aim to assess students’ progress in mathematics generally and covers questions from all topics that have been covered at any point in the students’ mathematical history (not just this academic year). Again, this assessment is different, in order to prepare students for the style of paper and questioning at Key Stage 4.
- Mini start-of-topic tests provide information for teachers regarding prior knowledge and existing misconceptions. 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.