**KEVICC Key Stage 3 Curriculum Subject:** Mathematics

**Summer Half-Term 2 Reasoning with Numbers**

**Term:** Year 7 Summer Term – Block Four | **Topic:** Sets and Probability

**What is the essential knowledge from this unit?**
**What do students need to remember and understand?**

FDP equivalence will be revisited in the study of probability, where students will also learn about sets, set notation and systematic listing strategies

**National curriculum** content covered:

- Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0 - 1 probability scale.
- Understand that the probabilities of all possible outcomes sum to 1.
- Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams.
- Generate theoretical sample spaces for single and combined events with equally likely and mutually exclusive outcomes and use these to calculate theoretical probabilities.
- Appreciate the infinite nature of the sets of integers, real and rational numbers

We know that breaking the curriculum down into small manageable steps should help students to understand concepts better. As a result, for each block of content in the scheme of learning we have provided the following 'small step' breakdown for this unit as follows:

**Lesson One** - Identify and represent sets.
**Lesson Two** - Interpret and create Venn diagrams.
**Lesson Three** - Understand and use the intersection of sets.
**Lesson Four** - Understand and use the union of sets.
**Lesson Five** - Understand and use the complement of a set (H).
**Lesson Six** - Know and use the vocabulary of probability.
**Lesson Seven** - Generate sample spaces for single events.
**Lesson Eight** - Calculate the probability of a single event.
**Lesson Nine** - Understand and use the probability scale.
**Lesson Ten** - Know that the sum of probabilities for all possible outcomes is 1.

**Interleaving/Extension of previous work**

- FDP equivalence, and simple FDP addition and subtraction.
- Forming and solving equations.
- Adding and subtracting fractions.
- Understand and use the complement of a set (H).

**Key Vocabulary and notation.**

| | |
|---|---|
| Universal Set | Impossible |
| Inclusive | Likely |
| Element | Even |
| Member | Unlikely |
| Set | Certain |
| Venn diagram | Random |
| Intersection | Bias |
| Mutually | Event |
| Exclusive | Sample space |
| Union | Possibilities |
| Complement | Outcomes |
| And | Simplify |
| Intersect | Equivalent |
| Or | Equally Likely |
| Both | Scale |
| Whole | Impossible |
| Sum | Fair |

Mathematical questioning should be designed to unpick the structure of the maths and deepen the student's understanding. When students talk about mathematical concepts, they should develop the vital mathematical language that helps them explain their ideas fully.

Students are expected and encouraged to use terminology during all discussions, verbal feedback and in written content.

**What prior learning supports understanding of this content?**

- Mental arithmetic strategies.
- Use know facts to drive other facts.
- Evaluate an algebraic expression given a related fact.
- Use estimation.

**How does this content link to future learning?**

- List outcomes using sample space diagrams for one and two events.
- Find probabilities using tables and Venn diagrams.
- Recognise prime, square and triangle numbers.
- Express a number as a product of prime factors.
- Powers and roots.
- Make and test conjectures.
- Understand and use counterexamples.

**Reading**: *Where in the unit are students supported to read complex academic text?*

- Reading and understanding mathematical questions and problems' – teacher input.
- Decoding complex examination questions - explain what they are asking the student to do' – teacher input.
- Following instructions to solve problems - break down the tasks – teacher input.
- Recognising terminology, numbers, and symbols.
- Recognising patterns and relationships in mathematics.

**Writing:** *Independent writing tasks and how they are structured*

- Using the correct subject specific terminology for numbers and symbols – examination papers, class books.
- Responding to questions that ask for an explanation or a reason – examination papers, class books.
- Self-evaluation, reviewing, reflecting and analysis of own work –, class books, personalised learning checklists and analysis.
- Creating notes that can be used later for revision purposes - class books, revision cards, mind maps etc.

**Key assessments:**
How will students review the information learned?
**End of block assessments.**
End of block assessments provide a quick progress check at the end of each block of learning to make sure students have understood the content covered.
A Core paper – it is envisaged that all students will take this paper, to provide a direct comparison with the performance of the rest of the cohort. All topics from each term will be covered, and the use of a calculator is expected.
**End of term assessments.**
A Foundation paper – students who are working below national expectations will have the opportunity to show their understanding of the material with more straightforward questions. Non calculator paper.
A Higher paper – students who are working at or above national expectations will have the opportunity to tackle more challenging questions on the same material, plus the extra objectives indicated as "Higher" in our scheme of learning. Non calculator paper.
How will feedback be seen?
Marked end of block and term assessments.
Personalised learning checklists for end of term assessments identifying strengths and areas of development.
Written teacher feedback and marking in compliance with faculty and College Marking Policies. Student responses to marking.
Students self-mark using purple pen. Verbal feedback given every lesson from teacher and peers as appropriate.
Teacher and student self-assessment of presentation of class books will be completed to ensure written work is of high standard and students are achieving their potential.