

Scheme of Learning: Year 7 Summer Term

Topic Sequence: Reasoning with numbers

13	14	15
Developing number sense	Sets and probability	Prime numbers and proof

Topic Overview:

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

Learning Sequence:

Identify and represent sets In this step the students begin to systematically organize information into sets using set notation. They will identify members of sets given the elements, they should find the idea of a set familiar but much of the language will be unfamiliar so will be revisited regularly.

Interpret and create Venn diagrams Students will begin to sort information into venn diagrams seeing whether sets intersect or whether they are mutually exclusive. This may be linked to probability to help understand how venn diagrams can be used as a strategy in working out answers to other problems.

Intersection of sets Having already explored the structure of a venn diagram the students will be able to identify and interpret the part that represents the intersection of two or more sets. Using colour to highlight these areas is an effective way of finding this. Students will be explicitly taught to associate the word 'and' with intersecting sets. Exploring the intersection of areas where both sets are not true will extend thinking on this topic

Union of sets This step is to support students to distinguish between the union of sets members belong to A or B or both from the intersection covered in the previous step. Labeled venn diagrams and the use of colour will be used to help represent and develop understanding. Students will be explicitly taught to use the words 'and' and 'or'.

The complement of a set Students will be taught that the complement of a set is the members of the universal set that are not members of the set. Matching activities where children have to match pre-shaded venn diagrams will be used to help to embed this understanding. Students will be introduced to notation A' to represent the complement of A.

Use the vocabulary of probability Students will be encouraged to think about factors that affect the likelihood of an event happening as this informs their judgment. Sometimes students assume that there is an equal chance of an event happening or not, exposing these misconceptions by using well chosen examples.

Sample space Following on from systematically listing outcomes students will explore writing exhaustive lists for a single event this defining a sample space. They will also recognise whether a list is a sample space or whether elements are missing. This step provides opportunities to link concepts of sets and set notation.

Probability of a single event In this step students will be taught to calculate a single probability given their answers as a fraction, decimal or percentage but not ratio notation. Vocabulary such as 'random', 'bias' and 'equally likely' will be discussed, it will also be an opportunity to practice converting fractions, decimals and percentages. The fact that probabilities are between 0 and 1 will be stressed.

The probability scale Students will explore the probability scale understanding that the probability of an impossible event is 0, the probability of a certain event is 1 and all others are in between. They will revisit working out intervals on a number line and converting between fractions, decimals and percentages

Sum of probabilities This step requires the students to understand that the sum of probabilities for all possible outcomes is 1. Using the same fact they will also be able to calculate the probability of something not happening.

Sequence of Learning:		Topic Resources:	
1	Identify and represent sets	Knowledge Maps:	Basic probability
2	Interpret and create Venn diagrams		
3	Understand and use the intersection of sets	Assessment:	
4	Understand and use the union of sets	Knowledge:	End of Topic test
5	Understand and use the complement of a set (H)	Application of Knowledge:	Termly mixed topic assessment
6	Know and use the vocabulary of probability	Supportive Reading:	
7	Generate sample spaces for single events	Any supported reading listed here	Sparx Maths www.sparxmaths.co.uk
8	Calculate the probability of a single event		
9	Understand and use the probability scale	Corbett Maths : www.corbettmaths.com	
10	Know that the sum of probabilities of all possible outcomes is 1	AQA Revision Guide	

Scheme of Learning: Year 7 Summer Term

Topic Sequence: Reasoning with numbers

1	2	3
Developing number sense	Sets and probability	Prime numbers and proof

Topic Overview:

Factors and multiples will be revisited to introduce the concept of prime numbers, and the higher strand will include using Venn diagrams from the previous block to solve more complex HCF and LCM problems. Odd, even, prime, square and triangular numbers will be used as the basis of forming and testing conjectures. The use of counterexamples will also be addressed

Learning Sequence:

Find and use multiples Knowledge will be built on from KS2 and it will be emphasised that multiples are found by multiplying any number by a positive integer. The confusion between factors and multiple will be addressed.

Prime numbers Students will be shown that prime numbers are integers greater than 0 that have exactly 2 factors, 2 is the first prime number as 1 has only one factor. It will be an opportunity to revisit topics such as Venn diagrams.

Square and triangle numbers This step provides opportunities for students to spot patterns and follow a line of enquiry. They will be encouraged to notice that the sum of two consecutive triangle numbers in a square number and this can be easily shown with a diagram

Common factors and HCF Times tables knowledge are beneficial for this step. Students will be looking at common factors and of algebraic expressions if appropriate.

Common multiples and LCM Students will benefit from the modeling of a systematic method of finding the LCM. They will make the link to finding the lowest common denominator when adding fractions. They will also look at the LCM of more than two numbers and possibly algebraic expressions

Product of Prime factors A key concept that will covered is that all non-prime positive integers can be written as a product of prime factors and that this product is unique. Index form may be explored if appropriate. A factor tree may be used

Venn diagrams to find HCF/LCM Identifying the intersection on a Venn diagram as common elements in both sets reinforces the idea of common factors supporting the understanding of the calculation for the HCF. They will find any common multiples of two numbers using a Venn diagram and finally work out a method to calculate the LCM.

Make and test conjectures Conjectures arise when the students notice a pattern, they will have already made many conjectures (predicting the next term in a sequence, square numbers etc). The students will be provided with the opportunity to explore the concept of a conjecture by using examples where several conjecture emerge and can be tested

Counterexamples Students will understand the word counterexample as an example that shows a conjecture s false. It is often easier to disprove a conjecture than prove it.

Sequence of Learning:

1	Find and use multiples
2	Identify factors of numbers and expressions
3	Recognise and identify prime numbers
4	Recognise square and triangular numbers
5	Find common factors of a set of numbers including the HCF
6	Find common multiples of a set of numbers including the LCM
7	Write a number as a product of its prime factors
8	Use a Venn diagram to calculate the HCF and LCM (H)
9	Make and test conjectures
10	Use counterexamples to disprove a conjecture

Topic Resources:

Knowledge Maps:	
Assessment:	
Knowledge:	20 mark knowledge test
Application of Knowledge:	End of topic summative questions
Supportive Reading:	
Any supported reading listed here	Sparx Maths www.sparxmaths.co.uk
	Corbett Maths : www.corbettmaths.com
	AQA Revision Guide