Year 11 Unit 3

Millthorpe School
Mathematics Department

Probability 2 (Foundation and Higher)

Prior knowledge: Year 8 unit 7 probability
Year 9 unit 5 fractions, decimals and percentages

Leads onto: Year 11 exams
Year 12 statistical distributions

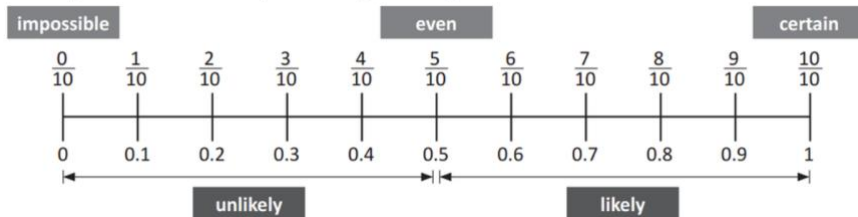| What do I need to be able to do?	Keywords/formula
- Complete a frequency tree - Understand and use the key vocabulary of probability - Understand that probabilities add to one - Represent probabilities on a number line as fractions, decimals or percentages - Calculate the probability of an event not happening - Complete sample space diagrams and calculate probabilities from them - Understand relative frequencies - Complete Venn diagrams and calculate probabilities from them - Use Venn diagrams for conditional probability - Complete tree diagrams and calculate probabilities from them - Use tree diagrams for dependent events (non replacement	**Probability vocabulary** Impossible, unlikely, even, likely, certain **Theoretical probability** is the number of ways an event can occur divided by the total possible outcomes **Relative frequency** is a probability calculated from experimental results **Bias** occurs when not all outcomes are equally likely ie. **not fair** **Mutually exclusive** events are events that can not happen together **Independent** events are those that do not impact upon each other **Sample space** diagrams, **Venn** diagrams and **tree** diagrams are different ways of representing

|	combined events and calculating their probabilities

Probability ideas

P(A) is the probability of event A

$$P(A) = \frac{number\ of\ ways\ event\ A\ can\ occur}{total\ number\ of\ possible\ outcomes}$$

Probabilities can be placed on a scale from 0 (impossible) to 1 (certain)

impossible					even					certain
$\frac{0}{10}$	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{4}{10}$	$\frac{5}{10}$	$\frac{6}{10}$	$\frac{7}{10}$	$\frac{8}{10}$	$\frac{9}{10}$	$\frac{10}{10}$
0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1

unlikely   likely

Frequency trees are a way of organising information that can be split into different categories
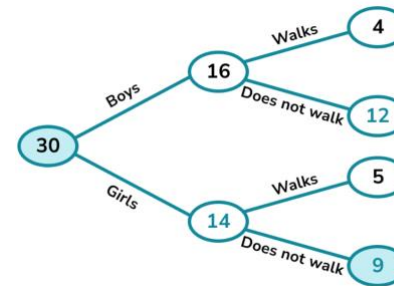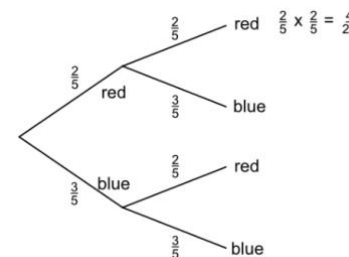

- After each 'split' the total of the pair of branches should be the same as the original value

Probability diagrams

Sample space diagrams show all the possible outcomes for two events eg the sum when you roll two fair six sided dice

Tree diagrams show possible outcomes for one event followed by another event eg taking a counter from a bag then taking another counter

- Each pair of branches adds to one
- The final outcomes are red red, red blue, blue red and blue blue.

- The probabilities of the final outcomes are calculated by multiplying the pair of individual probabilities together
- If the events are **dependent** (eg counters are not replaced) then the probabilities on the second branches will change

Venn diagrams represent the relationships between different groups

- The **intersection** is those elements In both groups: $A \cap B$
- The **union** is those elements in either group or both: $A \cup B$
- The **complement** is those elements not in a group: A'