Learning Journey for Statistics
Binominal Distributions (HIGHER ONLY)

How does this unit link to prior learning?	What will you be learning about?
• Calculating simple probabilities. • Calculating complementary events and mutually exclusive events. • How to list all possible outcomes. • How to read or create sample space diagrams, e.g. rolling two dice. • How to calculate probabilities from a sample space. • Calculate the mean, median, and mode. • Understand these as measures of central tendency. • The fact that expected value is a kind of 'average outcome'. • How to calculate relative frequency.	• Be able to use binomial and normal distributions to calculate probability. • Be able to calculate and use action and warning lines. • Understand how action and warning lines are used in context.
	British Values
	• Rule of Law - follow the rules of probability and know when to use them. • Mutual Respect - listening and learning from both the teacher and peers to ensure a positive and productive learning environment.
	Key vocabulary
	Binomial distribution, normal distribution, probability, bell shape curve, standard deviation, standardised scores, mean, median, range, warning lines, action line.

Prior Knowledge

There are only n red balls and $(n + 1)$ blue balls in a bag.

Shamsa takes at random 2 balls from the bag.

Show that the probability that both balls are the same colour is $\frac{n}{2n+1}$

(a) Work out the value of 3.1^4

(b) Simplify $(p^3)^2$

(c) Simplify

$2^3 \times 2^n = 2^9$

(d) Work out the value of n.

We will develop our learning each week by focusing on:

Lesson 1: Binomial Distribution	RAG

• Understand and use notation B(n, p) for binomial distribution • Identify when a binomial distribution should be used, and the conditions needed. • Begin to calculate basic probabilities using binomial distribution	
Lesson 2: Binomial Distribution • Calculate 'exact' probabilities using binomial distribution • Calculate probabilities of multiple outcomes using binomial distribution ('at least' or 'at most) • Know and be able to use that the mean for a binomial distribution is found by np	
Lesson 3: Normal Distribution • Know the shape of a normal distribution. • Understand the notation N(μ, σ^2). • Know the conditions that make the normal distribution suitable.	
Lesson 4: Normal Distribution • Know how to draw two distribution curves on the same graph. • Calculate probabilities using standard deviations from a normal distribution (68%, 95% and 99.8%).	
Lesson 5: Quality Control Charts • Understand the process of quality assurance and see why this is necessary in the real world. • Calculate and use action and warning lines in quality assurance sampling applications. • Understand where data lies within action and warning lines.	
Lesson 6: Standardised Scores • Use standardised scores to compare two samples of data.	
Lesson 7: Revision Lesson • Select resources to use to revise for the end of topic assessment.	
Lesson 8: Assessment Lesson • Do 10-minute top up and go through answers together, students to self-assess. • Open book assessment done in silence.	
Lesson 8: Feedback Lesson • Students to highlight their traffic light sheet. • Teacher to go through assessment and students to self-assess in green pen. • Students to complete the NOW section of the WOW-HOW-NOW sheet.	

How will this help you in the future?	
KS4	**Beyond LHS**
• **KS4 Maths** Graphs, algebra, ratios, interpreting data. • **KS4 Science** Genetics, half-life, uncertainty, experiments. • **KS4 Business Studies** Forecasting, risk, data analysis. • **KS4 Computer Science** Randomness, algorithms, simulations. • **KS4 Geography** Climate risk, sampling, interpreting results.	• **Managing Money and Personal Finance:** Probability informs decisions on insurance, investments, and financial risk. • **Useful in Many Careers**: Medicine, business, engineering, computing, and public services all use probability distributions. • **Understanding Games and Randomness:** Probability explains fairness, gambling odds, and randomness in games.