



The Sutton Academy

Knowledge Rich Curriculum Plan

Distribution

Lesson/Learning Sequence	Intended Knowledge: <i>Students will know that...</i>	Tiered Vocabulary	Prior Knowledge: <i>In order to know this students, need to already know that...</i>	Assessment
Lesson Objective: To learn how to draw and use the properties of the normal distribution.	<ul style="list-style-type: none"> Students will know the normal distribution has a bell shape with asymptotes at each end Students will know that the normal distribution is symmetrical (mean = median = mode) Students will know that the area under the curve is equal to one. Students will know that IF X is normally distributed random variable, you write $X \sim N(\mu, \sigma^2)$. Where μ = mean and σ^2 = Variance. Students will know that 68% of the data lies within one standard deviations of the mean. Students will know that 95% of the data lies within two standard deviations of the mean. Students will know that nearly all of the data (99.7%) lies within three standard deviations of the mean 		Students will have knowledge about mean and variance. Students will know what a continuous random variable.	
Lesson objective: To learn how to find probabilities from a normal distribution.	<ul style="list-style-type: none"> Students will know to always sketch a graph to check that their answer makes sense. Students will know how to use their calculators to find probabilities of normal distribution. Students will know that you can use either $>$ and \geq interchangeably with a continuous distribution. 		Students will need to know how to find probabilities. Students need to know how to find probabilities using binomial distribution.	
Lesson objective: To learn how find the inverse normal distribution function.	<ul style="list-style-type: none"> Students will know that for a given probability p, you can use your calculator to find a value of a such that $P(X < a) = p$. This is called the inverse normal distribution. 		Students will need to know how to find probabilities using a calculator for normal distribution.	
Lesson objective: To learn to standardise the normal distribution.	<ul style="list-style-type: none"> Students will know that the standard normal distribution has mean 0 and standard deviation 1. Students will know that if $X \sim N(\mu, \sigma^2)$ is a normal distribution with mean μ and standard deviation σ then you can code X using the formula $Z = \frac{X - \mu}{\sigma}$ where the resulting z-values will be normally distributed with mean 0 and standard deviation 1. Students will know that for the standard normal curve $Z \sim N(0, 1^2)$ the probability $p(Z < a)$ is sometimes written as $\Phi(a)$. Students will know how to find the probabilities of a standardised normal distribution. Students will know how to find a z value given a probability. 		Students need to know how to use the normal distribution to find probabilities. Students need to know the shape of a normal distribution curve	

Lesson/Learning Sequence	Intended Knowledge: <i>Students will know that...</i>	Tiered Vocabulary	Prior Knowledge: <i>In order to know this students, need to already know that...</i>	Assessment
Lesson objective : To learn how to find the mean and standard deviation.	<ul style="list-style-type: none"> • <i>Students will be able to find the mean given the probability.</i> • <i>Students will be able to find the standard deviation given the probability</i> • <i>Students will be able to find the mean and standard deviation given two probabilities.</i> 		Students will need to know how to standardise a normal distribution Students will need to know how to find a Z value	
Lesson objective : To learn how to approximate a binomial distribution.	<ul style="list-style-type: none"> • <i>Students will know that if n is large and p is close to 0.5, then the binomial distribution $X \sim (n, p)$ can be approximated by the normal distribution if $X \sim N(\mu, \sigma^2)$ where $\mu = np$ and $\sigma = \sqrt{np(1-p)}$</i> • <i>Students will know to approximate the binomial distribution using normal distribution.</i> • <i>Students will know how to estimate probabilities by approximating probabilities</i> • <i>Students will know how to apply a continuity correction.</i> 		Students need to know how to derive a binomial distribution. Students need to know how to find probabilities using normal distributions.	
Lesson objective: To learn how to hypothesis with the normal distribution.	<ul style="list-style-type: none"> • <i>Students will know that for a random sample size n taken from a random variable $X \sim N(\mu, \sigma^2)$ the sample mean, $\bar{X} \sim N\left(\mu, \frac{\sigma^2}{n}\right)$</i> • <i>Students will know that how to determine if a mean is statistically</i> • <i>Students will know how to standardise a sample mean and standard deviation.</i> • <i>Students will know how to carry out a hypothesis test on the normal distribution.</i> 		Students will know how to find probabilities using the normal distribution.	

