YEAR 11 - MATHEMATICS

Preliminary Topic 3 - DISCRETE PROBABILITY DISTRIBUTIONS

MATHEMATICS ADVANCED

LEARNING PLAN			
Learning Intentions Student is able to:	**Learning Experiences** Implications, considerations and implementations:	**Success Criteria** I can:	**Resources**
(i) Define and categorise random variables	Continuous random variables are variables which take all values in an interval of real numbers which is not countable. For example, the time it takes for a bulb to burn out.	Know that a random variable describes some aspect in a population from which samples can be drawn Know the difference between a discrete random variable and a continuous random variable	[Discrete and Continuous Random Variables](#)
(ii) Use discrete random variables and associated probabilities to solve practical problems		Use relative frequencies obtained from data to obtain point estimates of probabilities associated with a discrete random variable Recognise uniform random variables and use them to model random phenomena with equally likely outcomes	

(iii) Understand how to use samples		Develop an understanding of the relationship between the distribution of the sample means and the population mean.	The Sampling Distribution of the Mean

Sample Questions:

- Find the probability distribution of the random variable describing the number of heads that turn up when a coin is flipped four times.

- The total number of cars to be sold next week is described by the following probability distribution

X	0	1	2	3	4
$p(X)$	0.05	0.15	0.35	0.25	0.20

Determine the expected value and standard deviation of X, the number of cars sold.

- There are five boxes having 10 pens in each. A box is rejected by a retailer if it contains more than three defective pens. Model this situation using a random variable, by assigning a probability to the likelihood that any one pen is defective, and state the values the random variable could attain.

- Select a range of samples from a fixed population and record the characteristics of each sample. Compare the mean and standard deviation of samples with the mean and standard deviation of the fixed population.