

Mathematics		Curriculum Checkpoints: What do students know and what can they do?			
Y12 Applied					
Summative Comment		Developing	Securing	Mastering	Excelling
AF1	Statistical sampling	<i>Understand and be able to use the terms 'population' and 'sample'; and know the types of sampling</i>	Describe advantages and disadvantages of sampling techniques	Know how to use samples to make informal inferences about the population; be able to describe advantages and disadvantages of sampling compared to census.	Based on the large data set you are able to make statistical inferences based geographical location of the 8 cities
AF2	Measures of location	Calculate measures of location, mean, median and mode;	Calculate measures of variation, standard deviation, variance, range and interpercentile range;	Interpret and draw inferences from summary statistics.	Use coding to find mean and standrad deviation of coded data and origiinal mean & std deviation
AF3	Probability	Finding the probability from sample space diagrams, frequency table an given experimental conditions	Use venn diagram to find missing probability	Use mutually exclusive and independent events when calculating probabilities from Venn diagrams	Find probability from tree diagrams and converting them to a venn diagram

AF4	Representation of data	Interpret diagrams for single-variable data, including understanding that area in a histogram represents frequency	Know how to interpret scatter diagrams and regression lines for bivariate data; recognise the explanatory and response variables;	Recognise the explanatory and response variables and understand that correlation does not imply causation;	recognise and interpret possible outliers in data sets and statistical diagrams; to select or critique data presentation techniques in the context of a statistical problem; to clean data, including dealing with missing data, errors and
AF5	Correlation	Draw and interpret scatter diagrams	Interpret correlation and understand that it does not imply causation	Interpret the coefficients of a regression line equation for bivariate data	understand when you can use a regression line to make predictions
AF6	Statistical distribution	understand and be able to use simple, discrete probability distributions, including the binomial distribution;	Identify the discrete uniform distribution and find probabilities	Calculate probabilities using the binomial distribution	Calculate probabilities from cumulative distribution
AF7	Hypothesis testing	Apply the language of statistical hypothesis testing developed	conduct a statistical hypothesis test for the proportion in the binomial	Use a one tailed test to carry out a hypothesis test and appreciate that the significance	Use a two tailed test to carry out hypothesis test and appreciate that the significance level is the probability of incorrectly

AF7	Hypothesis Tests	hypothesis testing, developed through a binomial model.	distribution and interpret the results in context	appreciate that the significance level is the probability of incorrectly rejecting the null hypothesis	level is the probability of incorrectly rejecting the null hypothesis. Find the critical values based on significance level
AF8	Quantities & units in	Understand and use derived quantities and units: velocity, acceleration, force, weight;	Know the difference between position, displacement and distance. Know the difference between velocity and speed, and between acceleration and magnitude of acceleration;	Know the difference between mass and weight (including gravity);	Understand that there are different types of forces.
AF9	constant acceleration	Draw and interpret kinematics graphs, knowing the significance (where appropriate) of their gradients and the areas underneath them.	Recognise when it is appropriate to use the suvat formulae for constant acceleration;	Solve kinematics problems using constant acceleration formulae for horizontal motion	Solve problems involving vertical motion under gravity using the correct suvat
AF10	Forces and motion	Understand the concept of a force; understand and use Newton's first law.	Understand and be able to use Newton's second law for motion in a straight line (restricted to forces in two perpendicular directions or simple cases of forces given as 2D (i, j) vectors.);	Understand and use Newton's third law; equilibrium of forces on a particle and motion in a straight line; application to problems involving smooth pulleys and connected particles.	Finding missing forces with Lift problems where objects are placed in the lift

AF11	variable acceleration	Use calculus (differentiation) in kinematics to model motion in a straight line for a particle moving with variable acceleration;	Understand that gradients of the relevant graphs link to rates of change;	<p>Know how to find max and min velocities by considering zero gradients and understand how this links with the actual motion (i.e. acceleration = 0).</p> <p>To use calculus (integration) in kinematics to model motion in a straight line for a particle moving under the action of a variable force;</p>	<p>Understand that the area under a graph is the integral, which leads to a physical quantity;</p> <p>know how to use initial conditions to calculate the constant of integration and refer back to the problem.</p>
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