

## Y10 Unit 4 Overview-Data Analysis and Probability:

Test Date: WB 22<sup>nd</sup> June, 2020.

Target grade for tests:

You will learn about:

- Probability and likelihood.
- Accurately presenting data.
- Choosing the most appropriate average.

You will be able to:

- Understand the probability scale and calculate the probability.
- Compare theoretical and experimental probability.
- Record, describe & analyse the frequency of outcomes of probability experiments using tables & frequency trees.
- Apply the property that the probabilities of an exhaustive set of outcomes sum to one.
- List outcomes systematically using lists, tables, grids, sample space diagrams and Venn diagrams and use these to calculate theoretical probabilities.
- Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments.
- Plot and interpret scatter graphs recognising correlation.
- Draw and interpret histograms.
- Calculate and interpret averages and justify your choice of average.



### Lesson Overview

#### UNDERSTANDING RISK (PROBABILITY AND LIKELIHOOD)

- Know that probability is a way of measuring likelihood
- Know and use the vocabulary of probability
- Understand the use of the 0-1 scale to measure probability
- Assess likelihood and place events on a probability scale
- List all the outcomes for an experiment
- Identify equally likely outcomes
- Work out theoretical probabilities for events with equally likely outcomes
- Know how to represent a probability
- Recognise when it is not possible to work out a theoretical probability for an event
- Know and use the fact that the sum of probabilities for all outcomes is 1
- List all elements in a combination of sets using a Venn diagram
- List outcomes of an event systematically
- Use a table to list all outcomes of an event
- List outcomes of an event using a grid (two-way table)
- Use frequency trees to record outcomes of probability experiments
- Make conclusions about probabilities based on frequency trees
- Construct theoretical possibility spaces for combined experiments with equally likely outcomes
- Calculate probabilities using a possibility space
- Use theoretical probability to calculate expected outcomes
- Use experimental probability to calculate expected outcomes

#### PRESENTATION OF DATA

- Know the meaning of continuous data
- Interpret a grouped frequency table for continuous data
- Construct a grouped frequency table for continuous data
- Construct histograms for grouped data with equal class intervals
- Interpret histograms for grouped data with equal class intervals
- Construct and use the horizontal axis of a histogram correctly

### Key Words

#### Refer to

<http://studymaths.co.uk/glossary.php>  
for definitions of the key words

Probability, Theoretical probability  
Event  
Outcome  
Impossible, Unlikely, Evens chance, Likely, Certain  
Equally likely outcomes  
Mutually exclusive  
Exhaustive  
Possibility space, sample space  
Experiment, Combined experiment  
Relative frequency  
Frequency tree  
Set  
Venn diagram  
Random  
Bias, Fairness

#### Notation

Probabilities are expressed as fractions, decimals or percentage. They should not be expressed as ratios (which represent odds) or as words

$P(A)$  for the probability of event A

#### Data

Categorical data, Discrete data  
Continuous data, Grouped data  
Table, Frequency table  
Frequency  
Histogram

- Plot a scatter diagram of bivariate data
- Understand the meaning of 'correlation'
- Interpret a scatter diagram using understanding of correlation

**DATA ANALYSIS**

- Find the modal class of set of grouped data
- Find the class containing the median of a set of data
- Find the midpoint of a class
- Calculate an estimate of the mean from a grouped frequency table
- Estimate the range from a grouped frequency table
- Analyse and compare sets of data
- Appreciate the limitations of different statistics (mean, median, mode, range)
- Choose appropriate statistics to describe a set of data
- Justify choice of statistics to describe a set of data

Scale, Graph  
 Axis, axes  
 Scatter graph (scatter diagram, scattergram, scatter plot)  
 Bivariate data  
 (Linear) Correlation  
 Positive correlation, Negative correlation

**Notation**  
 Correct use of inequality symbols when labelling groups in a frequency table  
 Eg  $0 \leq h < 10$

Average  
 Spread  
 Consistency  
 Mean  
 Median  
 Mode  
 Range  
 Statistic  
 Statistics  
 Approximate, Round  
 Calculate an estimate  
 Grouped frequency  
 Midpoint

**Suggested reading or support/ challenge available**

Support is available from a Maths teacher in 'MORALE' in M1 daily from 1:30pm -1:45pm

**Pixl Maths App**

login: PY2415  
 username: surname followed by first initial  
 password: first name

[www.hegartymaths.com](http://www.hegartymaths.com)

Go to student login at the top... find your school, enter your details and then set up your password...

<https://vle.mathswatch.com/vle/>

login: school username followed by @penryn-college  
 password: Penryn2016

**Use your revision guide**

Use the code in the front of your guide to access your free online revision

**Cross curricular**

**SMSC:**  
 1.1 Exploring, understanding and respecting cultural diversity e.g. exploration of different methods of calculation.  
 3.1 Developing personal qualities and using social skills (regular paired/ group work communication).  
 3.2 Participating, cooperating and resolving conflicts (paired/group activities).  
 4.2 Experiencing fascination, awe and wonder of mathematics.  
 4.4 Using imagination and creativity in learning.  
**Literacy:**  
 Verbal communication of understanding using key words in the correct context. Development of written communication of methods and strategies to problem solve.  
**NAC:**  
**Science** – Understand and use the probability scale from 0 to 1. Find probabilities using equally likely outcomes or experiment. Use two-way tables to record all the possible outcomes of two events. Use relative frequency to estimate probability. Create frequency tables to record continuous data. Draw and interpret scatter diagrams. Understand simple correlation. Estimate the mean, median and range of grouped data. Use averages and ranges to compare data.  
**Geography** – Understand and use the probability scale from 0 to 1. Find probabilities using equally likely outcomes or experiment. Use two-way tables to record all the possible outcomes of two events. Use relative frequency to estimate probability. Create frequency tables to record continuous data. Draw and interpret

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Perfect for revision.  
Including practice exam  
questions on specific  
topics and the "5-a-day"

histograms. Draw and interpret scatter diagrams. Understand simple correlation. Estimate the mean, median and range of grouped data. Use averages and ranges to compare data.

**Technology** - Find probabilities using equally likely outcomes or experiment (Year 11).

Research	
Note-making	
Group work & discussion	
Memorisation	
Precision & accuracy	
Independence	
Reflection	