



## YEAR 12 Autumn TERM 2

'An ambitious curriculum that meets the needs of all'

### Medium Term Planning – Units 5-7 PURE Straight Line Graphs, Circles, Algebraic Methods

### Medium Term Planning – Units 4-6 APPLIED Correlation, Probability, Statistical distributions

#### Curriculum Intent

#### PURE UNIT 5: *Straight Line Graphs*

##### Skills/Assessment Objective Links

###### Chapter 5: Straight line graphs

|   |
|---|
| T P27 I can calculate the gradient of a line joining a pair of points   |
| T P28 I can understand the link between the equation of a line, and its gradient and intercept                          |
| T P29 I can find the equation of a line given (i) the gradient and one point on the line or (ii) two points on the line |
| T P30 I can find the point of intersection for a pair of straight lines   |
| T P31 I know and use the rules for parallel and perpendicular gradients   |
| T P32 I can solve length and area problems on coordinate grids  |
| T P33 I can use straight line graphs to construct mathematical models   |

##### Prior knowledge

- Finding intersections of lines (GCSE)
- Simplify surds (Y1 PURE Unit 1)
- Changing the subject (GCSE)

##### Learning further developed in the future in:

- Year 1 Pure Unit 6

#### Skills/Assessment Objective Links

#### Prior Knowledge

#### Current learning to be developed in the future

#### PURE UNIT 6: *Circles*

##### Skills/Assessment Objective Links

###### Chapter 6: Circles

|   |
|---|
| T P34 I can find the mid point of a line segment  |
| T P35 I can find the equation of the perpendicular bisector to a line segment                       |
| T P36 I know how to find the equation of a circle   |
| T P37 I can solve geometric problems involving straight lines and circles                           |
| T P38 I can use circle properties to solve problems on coordinate grids                             |
| T P39 I can find the angle in a semicircle and solve other problems involving circles and triangles |

##### Prior knowledge

- Completing the square (Y1 PURE Unit 2)
- Finding the equation of a line passing through two points (Y1 PURE Unit 5)
- Determining the number of roots by using the discriminant (Y1 PURE Unit 2)
- Perpendicular line equations (Y1 PURE Unit 5)

##### Learning further developed in the future in:

- Year 2 Pure Unit 8

## **PURE UNIT 7 : Algebraic methods**

### **Skills/Assessment Objective Links**

| Chapter 7: Algebraic methods  |
|---|
| T P40 I can cancel factors in algebraic fractions                   |
| T P41 I can divide a polynomial by a linear expression              |
| T P42 I can use the factor theorem to factorise a cubic expression  |
| T P43 I can construct mathematical proofs using algebra             |
| T P44 I can use proof by exhaustion and disproof by counter-example |

### **Prior knowledge**

- Simplifying expressions (Y1 PURE Unit 1)
- Factorising Quadratics (Y1 PURE Unit 1)
- Long division (GCSE)
- Equations of lines through given coordinates (GCSE)
- Completing the square (Y1 PURE Unit 2)

### **Learning further developed in the future in:**

- Year 2 Pure Unit 1

## **APPLIED UNIT 4: Correlation**

### **Skills/Assessment Objective Links**

| Chapter 4: Correlation  |
|---|
| T S15 I can draw and interpret scatter diagrams for bivariate data                      |
| T S16 I can interpret correlation and understand that it does not imply causation       |
| T S17 I can interpret the coefficients of a regression line equation for bivariate data |
| T S18 I understand when you can use a regression line to make predictions               |

### **Prior knowledge**

- Scatter Diagrams (GCSE)
- Gradients and y-intercepts of straight lines (GCSE)

### **Learning further developed in the future in:**

- Year 2 Applied Unit 1

## **APPLIED UNIT 5: Probability**

### **Skills/Assessment Objective Links**

| Chapter 5: Probability   |
|--|
| T S19 I can calculate probabilities for single events  |
| T S20 I can draw and interpret Venn diagrams   |
| T S21 I understand mutually exclusive and independent events, and determine whether two events are independent |
| T S22 I can use and understand tree diagrams   |

### **Prior knowledge**

- Probability of a single event (GCSE)
- Listing outcomes (GCSE)

- Probability of multiple events (GCSE)

### Learning further developed in the future in:

- Year 2 Applied Unit 2
- Year 2 Applied Unit 3

## **APPLIED UNIT 6: Statistical Diagrams**

### **Skills/Assessment Objective Links**

#### **Chapter 6: Statistical distributions**

**T** S23 I understand and use simple discrete probability distributions including the discrete uniform distribution

**T** S24 I understand the binomial distribution as a model and comment on appropriateness

**T** S25 I can calculate individual probabilities for the binomial distribution

**T** S26 I can calculate cumulative probabilities for the binomial distribution

### **Prior knowledge**

- Probability of multiple events (Y1 APPLIED Unit 5)

### Learning further developed in the future in:

- Year 1 Applied Unit 7
- Year 2 Applied Unit 3

#### **Spiritual, moral, social, and cultural development**

**SMSC:** Making choices, looking for patterns which may reflect the natural world, supporting and collaborating with each other, realisation that mathematics is an international language and making cultural links as we explore the history of mathematics.

**PSHE/British Values:** Working collaboratively, being respectful during discussion and valuing contributions made by others

**Skills Builder:** Key skills in numeracy used in all topic areas.

#### **Numeracy**

**Focus on key skills.**

#### **Literacy**

**Vocabulary Tier 2:** Command words displayed in the classroom and italicized/bold font used in shared resources/presentations. These are a constant focus in discussion and questioning,  
**Vocabulary Tier 3:** Title slide in all shared resource presentations show the key vocabulary for each topic.  
**Reading:** Underlining command words,  
**Writing:** Modelling solutions  
**Oracy:** Think, pair, share, discussion, verbal feedback (peer to peer), questioning, student modelling

#### **Becoming future ready**

**Personal Skills:** As a Mathematics student you will learn many skills: you will gain opportunities to listen to others supportively and to use questioning to develop your own understanding, you will learn how to cope with challenging questions and how to build up your resilience, you will get the chance to work on your own and with others. You will develop problem solving skills and you will learn how to break a problem down into smaller more manageable steps. You will learn how to collaborate with others when solving problems and you will learn how to articulate your solution to a problem.

**Employability:** Mathematical skills are invaluable in the workplace. There are many transferable skills which are much valued by employers. Specific career paths for each topic are discussed at the beginning of each unit of work.

#### **Adaptation**

#### **QFT/SEND Provision**

- By progressive questioning: exploring pupils' understanding through interactive dialogue.
- By outcome: different learners will produce different outcomes.
- By resource: worksheets are clearly presented and accessible.
- By intervention: by providing different levels of supervision and support.
- By offering optional activities: In class or as homework, to extend learning.

|                                    |  |
|------------------------------------|--|
| Implementation Curriculum Delivery | See curriculum intent  |
| Learning Outcomes (Knowledge)      |  |
| Assessment                         | Refer to assessment maps for formative and summative assessment opportunities.     |
| Impact                             | Attainment and Progress – Refer to assessment results / data review documentation. |