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| **Year 2 pure unit 3: Series and Sequences** | **Road Map** | | | | | |
| In this unit you will learn about pure maths. The aims are as follows:  **LG1**: Knowledge  **LG2**: Application  **LG3**: Skills | Assessment Grades |  |  | | | |
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| **Themes** | **Learning Goals/Outcomes/Content** | | |  |  |  |
| **3a. Arithmetic and geometric progressions** | know what a sequence of numbers is and the meaning of finite and infinite sequences; | | |  |  |  |
| know what a series is; | | |  |  |  |
| know the difference between convergent and divergent sequences; | | |  |  |  |
| know what is meant by arithmetic series and sequences; | | |  |  |  |
| be able to use the standard formulae associated with arithmetic series and sequences; | | |  |  |  |
| know what is meant by geometric series and sequences; | | |  |  |  |
| be able to use the standard formulae associated with geometric series and sequences; | | |  |  |  |
| know the condition for a geometric series to be convergent and be able to find its sum to infinity; | | |  |  |  |
| be able to solve problems involving arithmetic and geometric series and sequences; | | |  |  |  |
| know the proofs and derivations of the sum formulae (for both AP and GP). | | |  |  |  |
| **3b. Sigma notation** | be familiar with ∑ notation and how it can be used to generate a sequence and series; | | |  |  |  |
| know how this notation will lead to an AP or GP and its sum; | | |  |  |  |
| Know that . | | |  |  |  |
| **3c. Recurrence and iterations** | know that a sequence can be generated using a formula for the *n*th term or a recurrence relation of the form *xn* + 1= f(*xn*); | | |  |  |  |
| know the difference between increasing, decreasing and periodic sequences; | | |  |  |  |
| understand how a recurrence relation of the form *Un*= f(*Un*-1) can generate a sequence; | | |  |  |  |
| be able to describe increasing, decreasing and periodic sequences. | | |  |  |  |

**Links:**

LG1: You will learn what is meant by arithmetic and geometric sequences and series of various types, and know and be able to use the standard formulae that apply to these. You will learn the proofs and derivations of the sum formulae for both AP and GP. You will learn how to use sigma notation. You will learn how to use a recurrence relation to generate a sequence.

LG2: You will be able to apply your knowledge of sequences and series to the modelling of various situations such as finance or tide height, and should be able to explain the assumptions that you have made and the limitations of your models.

LG3: You will be able to solve a variety of routine and non-routine problems, by combining several Mathematical skill sets. For example, by using sequences to investigate problems from mechanics such as a bouncing ball.