The curriculum outline and a sample lesson plan for Computer Science and Mathematics.

Computer Science Curriculum:

- **Lower Sixth (Form 6):**

- Introduction to Computer Science (10 weeks) - Week 1-2: Basics of Computer Science, Input/output Devices - Week 3-4: Algorithms and Flowcharts - Week 5-6: Basic Programming Concepts (Variables, Data Types) - Week 7-8: Conditional Statements and Loops - Week 9-10: Project Work (Design a Simple Program) - Computer Systems and Hardware (10 weeks) - Week 1-2: Computer Hardware Components - Week 3-4: Software Types and Functions - Week 5-6: Computer Networks and Internet - Week 7-8: Cybersecurity and Online Safety - Week 9-10: Practical: Assemble a Computer

- **Upper Sixth (Form 7):**

- Programming Languages (10 weeks) - Week 1-2: Introduction to Python/Java - Week 3-4: Variables, Data Types, and Operators - Week 5-6: Control Structures (Conditional Statements, Loops) - Week 7-8: Functions and Modules - Week 9-10: Project Work (Develop a Simple Application) - Data Structures and Algorithms (10 weeks) - Week 1-2: Introduction to Data Structures (Arrays, Lists) - Week 3-4: Stacks and Queues - Week 5-6: Sorting and Searching Algorithms - Week 7-8: Graphs and Trees - Week 9-10: Project Work (Implement a Data Structure)

Mathematics Curriculum:

- **Lower Sixth (Form 6):**

- Algebra (10 weeks) - Week 1-2: Equations and Inequalities - Week 3-4: Functions (Domain, Range, Graphs) - Week 5-6: Quadratic Equations and Functions - Week 7-8: Systems of Equations - Week 9-10: Review and Assessment - Geometry (10 weeks) - Week 1-2: Points, Lines, and Planes - Week 3-4: Angles and Measurement - Week 5-6: Properties of Shapes (Triangles, Quadrilaterals) - Week 7-8: Circle Geometry - Week 9-10: Project Work (Design a Geometric Shape)

- **Upper Sixth (Form 6):**

- Calculus (10 weeks) - Week 1-2: Limits and Continuity - Week 3-4: Differentiation (Rules, Applications) - Week 5-6: Integration (Basic Concepts, Techniques) - Week 7-8: Applications of Calculus (Optimization, Area Under Curves) - Week 9-10: Review and Assessment - Vectors and Mechanics (10 weeks) - Week 1-2: Introduction to Vectors (Basic Operations) - Week 3-4: Vector Applications (Physics, Engineering) - Week 5-6: Mechanics (Motion, Forces, Newton's Laws) - Week 7-8: Energy and Work - Week 9-10: Project Work (Design a Mechanical System) **Sample Lesson Plan: Subject:** Computer Science **Topic:** Introduction to Algorithms **Grade Level:** Lower Sixth (Form 5) **Time:** 1 hour **Objectives:**

- Understand the definition of an algorithm
- Learn to create a simple algorithm
- Apply problem-solving skills using algorithms

Materials:

- Whiteboard and markers
- Printed copies of the algorithm example

Procedure:

1. Introduction (5 minutes):

- Introduce the concept of algorithms and their importance in computer science. - Ask students to share examples of algorithms in their daily lives.

2. Direct Instruction (15 minutes):

- Define an algorithm and provide examples (e.g., recipe, traffic light sequence). - Use flowcharts to illustrate the steps involved in an algorithm.

3. Guided Practice (15 minutes):

- Provide students with a simple problem (e.g., making a peanut butter and jelly sandwich).
- Ask students to work in pairs to create an algorithm for the problem.

4. Independent Practice (15 minutes):

- Provide students with a more complex problem (e.g., planning a road trip). - Ask students to create an algorithm for the problem
Ask students to create an algorithm for the problem and present it to the class.

Assessment:

- Observe student participation during the guided and independent practice activities.

- Review student algorithms for completeness and accuracy.