Welcome to A-Level Computer Science!

Due: The first lesson back. Bring your completed booklet and be ready to discuss it.

This summer work will you give you a head start on some of the exciting topics you'll be studying. It's not about perfection – it's about curiosity, effort, and building a solid foundation. We'll cover some key concepts, do a bit of programming, and reflect on the digital world around us.

Section 1: What is Computer Science?

Task: Research & Reflect

1. In your own words, define what computer science is:

2. Find a real-world example of where computer science is used in:
    a. Medicine
    b. Space exploration
    c. Business

3. What excites you most about studying computer science?

Section 2 – Key concepts

Match the following terms with their definitions and give a real-life example:

Key Term
CPU
RAM
Operating System
Algorithm
High-level Language
Assembly Language
Abstraction
Logic Gate

Definition	Real-life example
A step-by-step set of instruction to solve a problem or perform a task.	
A low-level language that is closer to the machine code and specific to a computer's hardware.	
A programming language that is easy for humans to understand.	
Hiding unnecessary details to focus on the main idea or function.	
A digital circuit that takes one or more inputs and produces an output based on a logical operation.	
The "brain" of the computer that processes instructions and carries out tasks.	
Software that manages hardware and software, and provides a user interface.	
Temporary memory that stores data the computer is currently using. It gets cleared when the power is turned off.	

Section 3: Introduction to binary

Convert the following:

1. 13 into 8-bit binary

2. 10101100 to decimal

3. 01101101 into hexadecimal

4. Convert 3A (hexadecimal) into decimal

Explain why binary is used in computers:

Section 4: Programming practice (Python)

If you've never programmed before, don't worry – have a go! If you're confident, challenge yourself.

Task 1: Hello Python

Write a simple program that:

- Asks for your name and age
- Calculates the year you'll turn 100
- Prints a message with this information

Your code:

Task 2: Spot the error

There are 3 bugs in this code, rewrite the corrected code below.

```
name = input("What is your name?)
age = input("Enter your age: ")
print("Hello " + name + " you are " + age " years old.")
```

Task 3: Challenge yourself

Create a quiz with 3 questions. The user should get a score at the end. Use variables, input(), if statements and print().

Your code:

Section 5: Computer Science in society

Task: Explore and evaluate

Read this short article "the role of AI in society"

Write a short response to the question:

Should AI be allowed to make decisions about humans (e.g. hiring, policing, sentencing)? Why? or why not? (200-300 words)

Final task: Reflection

Answer the following reflection questions:

1. What are you most looking forward to in A Level CS?

2. What are you most nervous about?

3. How confident do you feel about your Python skills out of 10?