Year 10 Autumn

LEARNING JOURNEY COMPUTER SCIENCE

ALGORITHMIC LITERACY - READING

Tracing through algorithms

Simple algorithms (input process output)

Selection in algorithms

Sequence in algorithms

Iteration in algorithms (count controlled)

Iterating through a list

Iteration in algorithms (condition controlled)

Validating input data

WE ARE HERE

From reading to writing

Testing algorithms in Python

Identifying and fixing errors (debugging)

Changing algorithms in Python

"Computational thinking is taking an approach to solving problems, designing systems and understanding human behaviour that draws on concepts fundamental to computing." – Jeanette Wing, Communications of the ACM, 2006
Computational thinking is the skill that underpins algorithms and programming. It describes the process between identifying a problem amenable to a computational approach, and implementing the solution to that problem using a programming language. It is an essential skill for all computer scientists, and it is the skill that you will develop over the course of your studies.

TUDOR HABITS
You will develop grit and resilience as you develop computational thinking skills on this learning journey.

VOCABULARY: Variable, sequence, selection, iteration, trace

Year 10 Holistic

LEARNING JOURNEY COMPUTER SCIENCE

COMPUTATIONAL THINKING

Problem decomposition

breaking down a complex problem or system into smaller parts that are more manageable and easier to understand

Pattern recognition

finding the similarities or patterns among small, decomposed problems that can help us solve more complex problems more efficiently

Abstraction

process of filtering out – ignoring - the characteristics of patterns that we don't need in order to concentrate on those that we do

Algorithmic design

WE ARE HERE

A plan, a set of step-by-step instructions to solve a problem

Implementation

The implementation of the algorithm (plan) using programming code

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TUDOR HABITS
You will develop grit and resilience as you develop computational thinking skills on this learning journey.

VOCABULARY: Computational thinking, pattern recognition, abstraction, algorithmic design, implementation