/Computing@Balcarras_

SUBJECT	YEAR	TERM
A-Level Computer Science (OCR)	**13**	**1**

UNIT

Algorithms

INTENT

PRIOR LEARNING (TOPIC) – GCSE Algorithms

To be successful computer scientists, pupils must be comfortable interpreting, writing and debugging algorithms. Throughout this unit pupils will have to understand and write a range of common algorithms, including searching, sorting and shortest path algorithms. Beyond this they must also be confident in using Big-O notation to measure the efficiency of the algorithms we cover.

Specification Points: This unit covers point 2.3.1

FUTURE LEARNING (TOPIC): Programming Project

IMPLEMENTATION

Throughout the unit pupils will cover:

- How the efficiency of algorithms can be measured using Big-O notation.
- Interpreting and writing algorithms for: bubble sorting, insertion sorting, quick sorting, merge sorting, linear searching, binary searching.
- Interpreting and writing algorithms to find shortest paths using Dijkstra's SPA and A Star.

IMPACT

Assessment: Pupils will sit a 40 mark in-lesson assessment at the end of the unit, the score from which will be translated into an A* to E style grading.

In addition to this, pupils will complete regular exam style questions both during lesson and as part of homework tasks.

HOW CAN PARENTS HELP AT HOME?

All course materials are available via Firefly. In the build-up to the assessment, parents can help by supporting their child's revision. This can include testing them using flash cards or simply getting them to explain topics to you.

HELPFUL READING/FURTHER DISCUSSION

READING/EXTRA-LEARNING

There are an enormous number of online courses and tutorials to help pupils develop their computer science skills further.

Visit the Next Steps section of the Computing department's Firefly page for more details.

CAREERS

The programming skills learnt in this unit lead perfectly into a wide range of careers including electrical engineer, IT technician and IT consultant.

WIDER SKILLS

Digital Literacy
Problem Solving
Resilience

VOCABULARY

Constant, Linear, Quadratic, Exponential, Logarithmic, Time, Space, Recursion, Base Case, Adjacency, Array, Pointer.