Bishop Heber High School

Subject	Year	Term
Computer Science	13	2

Topic

Logic And Programming Paradigms

Content (Intent)

Prior Learning (Topic) Data structures

Logic used in the processor, including binary maths, How to simplify logic circuits down to their most efficient form. How the main logic circuits inside the processor operate, including how memory and logical comparisons and maths is performed using flip flops and adders.

Objects and procedural programming. Why it is necessary to have different paradigms for software development and when each paradigm is used. Objects as representations of real world entities with a form and behaviour. Procedural programming as a method for breaking down a problem to modules, functions and procedures to return values and accomplish tasks. Record structures and why these have a form and no behaviour. Recursive functions, where a function calls itself as part of a divide and conquer technique where big problems can be logically reduced because solving many small simple problems is more efficient than solving a single complex problem.

Future Learning (Topic) Revision

What Knowledge and Skills will be taught (Implementation)	How will your understanding be assessed & recorded (Impact)
Computational maths, including logic and binary truth tables, combinations of logic gates to produce circuits, Boolean algebra and K maps. Floppy circuits, half and full adder.	Practice creating Kmaps and using principles of Boolean algebra to simplify equations and thereby simplify circuits. These will be marked in class, with feedback provided
How to use paradigms in order to solve problems using pseudocode and general routines for creating classes and initialising objects. Polymorphism, inheritance, instantiation. The use of stacks in recursion, why parameters can be passed into functions by ref or by val, and under which circumstances is each appropriate.	Problem solving using a series of examples from the course textbook. Discussion on the best way to tackle problems, and the classic methods for carrying out typical tasks such as finding the maximum number of items of a kind, finding out how many items are stored contiguously, techniques for interrogating linear, 2D and 3D data volumes.

How can parents help at home?

Ensure students revise for class tests.

Helpful further reading/discussion (including Reading and Vocabulary Lists)

Reading

Course textbook ISBN 978-1910523056
OCR AS and A Level Computer Science, by Heathcote and Heathcote

Vocabulary Lists

Describe
Explain
Discuss
Evaluate
Boolean Logic
Flip Flops
Adder Circuits
Difference
Refer
List