Bishop Milner CATHOLIC COLLEGE

Year 9 LONG-TERM SEQUENCE for Computing

The curriculum for this stage of students' education has been designed to further develop and extend computing knowledge acquired from year 8 computing. Predominantly, developing knowledge in the following three areas: computer science, information technology and digital literacy. Knowledge from each of these areas compliments each other and allows students to seamlessly gain both declarative (knowing that) and procedural (knowing how) knowledge. Students are further exposed to the core concepts of programming in a text-based programming language. Students are also advertised some of the content covered in AQA GCSE Computer Science course allowing students to transit smoothly to KS4.

HALF TERM 1

Ethical, illegal and environmental impacts of digital technology on wider society, including issues of privacy

STUDENTS MUST KNOW:

- What is an E-commerce website and what are the benefits and potential drawbacks associated with these websites.
- The different legislations related to computers.
- How to outline the impact of robotics and AI on today's world.
- How to discuss the relationship between unemployment and technology.

HOW THIS WILL BE ASSESSED:

Students will write an essay at the end of the unit and their work will be assessed against a rubric. Students' classwork and homework are reviewed and assessed online.

HALF TERM 2

Computer networks

STUDENTS MUST KNOW:

- What is a computer network and what are the advantages and disadvantage of having a computer network.
- The difference between WAN, PAN and LAN.
- How to compare wired networks to wireless networks, outlining benefits and drawbacks of each network type.
- How to compare BUS and STAR topologies, understanding benefits and drawbacks of each topology.

HOW THIS WILL BE ASSESSED:

Students will take a multiple-choice summative assessment at the end of the unit. Students' classwork and homework are reviewed and assessed online.

HALF TERM 3

Fundamentals of algorithms

STUDENTS MUST KNOW:

- The four core aspects of computational thinking (abstraction, decomposition, pattern recognition and algorithms).
- How to design algorithms using flowchart diagrams/pseudocode.
- How bubble and merge sort algorithms work.
- How linear and binary search algorithms work.

HOW THIS WILL BE ASSESSED:

Students will take a summative assessment at the end of the unit. Students' classwork and homework are reviewed and assessed online.

HALF TERM 4

Programming with Python

STUDENTS MUST KNOW:

- How to recall different data types
- How to construct an if-else statement for a given problem.
- How to make a choice about which loop (FOR/WHILE) to use with a justification.
- How to create a list and store/update values of a list.
- What is a procedure and know how to create a procedure in Python.
- The difference between parameters and arguments (use them accordingly when creating and using procedures).

HOW THIS WILL BE ASSESSED:

Students will sit a practical assessment at the end of the unit where they will demonstrate their ability to program independently. Students' classwork and homework are reviewed and assessed online.

HALF TERM 5

Data representation

STUDENTS MUST KNOW:

- The three number systems: Binary, denary and hexadecimal.
- How to perform conversions between the three number systems.
- How to perform basic binary arithmetic (adding, multiplying, divide and identifying odd/even binary numbers).
- What is binary overflow (where the answer to an addition or subtraction problem exceeds the magnitude which can be represented with the given number of bits).

HOW THIS WILL BE ASSESSED:

Students will take a summative assessment at the end of the unit. Students' classwork and homework are reviewed and assessed online.

HALF TERM 6

Game development in Python

STUDENTS MUST KNOW:

- Incorporate all knowledge gained from previous topics to create complexed programs in Python (including adapting and improving complexity).
- Use indentation correctly.
- Handle logical and syntax error.
- Enhance code and create programs which are robust and user friendly.

HOW THIS WILL BE ASSESSED:

Students will sit a practical assessment at the end of the unit where they will demonstrate their ability to program independently.

Embedding this knowledge can be supported at home by Worksheets (via TEAMS class notebook), BBC Bitesize website (KS3), Key word learning from Knowledge Organisers, Quick quizzes, Seneca website, CGP Books and W3Schools website.

Created by: Mrs Mahmood 2024

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