KESTEVEN AND SLEAFORD HIGH SCHOOL

Computing Scheme of Learning

Year 9 – Topic 1 – Binary and Hex

Intent – Rationale

Topic Intent: Introduce students to computational mathematics (binary/denary/hex conversion and binary addition)

Curriculum Intent: Developing an understanding of some of the underlying principles of Computer Science, with a focus on mathematical skills...

KS3 PoS: Understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
• N/A	• GCSE Computer Science (J277 1.2.3 and 1.2.4) • A-Level Computer Science (H446 1.4.1 and AO1) • Further/Higher Education and Related Careers
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
• Mathematics (place values, carries, borrows)	• GB4E
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**
Directly linked to topic o N/A Wider Reading/Interest: o N/A	• See curriculum links

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Computing Scheme of Learning

Year 9 – Topic 1 – Binary and Hex

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?

Know

- Understand how the Binary number system works (8bit integers)
- Understand how the Hexadecimal number system works and the use of nibbles for conversion to denary
- Understand how to convert between binary, denary and hexadecimal numbers
- Understand how to use familiar mathematical skills (place values, carry, borrow) in non-denary number systems

Apply

- Be able to convert between denary and binary integers
- Be able to convert between binary and hexadecimal integers
- Be able to add two binary integers together
- Be able to subtract binary integers

Extend

- Understand the impact of overflow in binary addition
- Understand why and how computers use two's complement addition in lieu of subtraction
- Investigate other number systems such as Octal

What subject specific language will be used and developed in this topic?	What opportunities are available for assessing the progress of students?
• *Binary*: Base 2 number system using 0 and 1 only • *Hexadecimal*: Base 16 number system using 0 to F • *Denary*: Base 10 number system aka decimal • *Bit*: Single binary digit 0 or 1 • *Nibble* 4 bits • *Byte* 8 bits • *Integer*: A whole number	• Workbooks, in-lesson observation and starter/plenary quizzes • Paper-based end of unit assessment

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Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
			See P drive