

NHSG Key Stage 3 Unit Overview for 7S3: Programming Concepts



Scheme of Learning	7S3 – Programming Concepts IPOSS – basic concepts	 	Spring term
Learning outcomes	By the end of the unit, students should have knowledge and understanding of what an algorithm is, how an algorithm is represented using flowcharts, why sequence matters, the difference between inputs and outputs., what a variable is and how to change the direction of a program using selection. This unit will introduce students to the use of flowcharts for creating control programs. It will develop the student’s computational thinking skills.		
Key Question	Can I create a control program for a complex system that requires the use of inputs, outputs, processes sequences and decisions?		
Knowledge	Key concepts • What is an algorithm? • Flowcharts • Sequence • Inputs • Outputs • Variables • Selection Key Skills • Building confidence in using a keyboard and mouse (extends from 7S1) • Learning the basics of flowcharts • Developing Computational Thinking • Developing visual interrogation methods • Developing error finding skills	Key terminology • Algorithm • Flowchart • Output • Input • Variable • Assignment • Selection • Sequence • Actuator • Sensor • Loop	



Ongoing Assessment	Progress and understanding is monitored through lessons by the teacher and a series of MS Forms and exercises. Students are expected to self-evaluate their achievements in the lesson using the provided template of key questions. They will then use homework time to secure a weak area that they have identified. Answers are expected to be in the student's own words and not paraphrased or directly copied from online resources. You will have access to the resources used via SharePoint/Teams and will be expected to continue familiarising with the systems each day outside of class. Students are expected to access Computer Science resources via Teams outside of lesson time and this is monitored throughout the year.	
Key Assessment	There are two assessment periods for Year 7. These take place towards the end of the Autumn term, and towards the beginning of the Summer term. Each assessment will check understanding of the units recently covered as well as their sustained understanding of previous units. The self-evaluation sheets should be used as the basis of what they need to revise. These assessments will have the same number of marks across the year group, though there may be some variety in the questions depending on the progress of the individual class. They are written tests on paper and consist of three sections: Knowledge (facts), Application, Explanation. The reports are based on how each student does in comparison with the rest of the year group in these assessments.	
Clear sequencing of content	Basics of programming: • Flowcharts • PRIMM technique • Outputs • Inputs • Variables • Sequence • Selection – simple then complex • Actuators/motors	

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	These lessons build on new functions each time and introduce new concepts and how they are applied in Flowol. These concepts are then built upon in 8S3 and 9S3 but using text-based programming languages and practical programming.
Links to Careers	Software development, particularly in numerical industries including engineering. Robotics, smart device functions.
Diversity and Inclusion	Scenarios used for creating algorithms are related to day-to-day experiences for students. They are encouraged to come up with, and share, algorithms from their own life.
Additional Support	Self-Assessment RAG sheets act as knowledge organisers with key questions for each lesson SharePoint with knowledge PowerPoints Year 8 mentors available one lunchtime a week upon request, or under direction if deemed necessary
Challenge	Coding Club TuringLabs – Farmbot and SmartCities https://projects.raspberrypi.org/en/projects/astro-pi-mission-zero www.flowgorithm.org https://projects.raspberrypi.org/en/projects/hello-world/0