Acle Academy

Year 11 – Data Types
Computer Science

Rationale and Context of Unit:	Core curriculum content:	Tier 2 & Tier 3 vocabulary explicitly taught:		
Almost every industry imaginable is crying out for Developers, and not enough people currently have the skills they need to get ahead. Studies show that over the next five years an additional 800,000 workers with digital skills will be needed to meet the rising demand from employers in Europe alone. Learning to read, write, and understand code will instantly help put you ahead of the curve. Coding is an extremely lucrative industry partly because it's facing such a huge skills shortage. Starting salaries for Junior Developers usually come in at around £30,000, which will increase as you add more coding languages to your arsenal and build your experience. As you progress, your skills will become highly in demand. A Senior Developer currently earns £65,000 and rising. If you've never considered coding, it can be easy to form misconceptions. But rather than being a set of indecipherable symbols only understood by techies, you might be surprised to learn than it's much more about finding solutions for issues than coming up with complex algorithms that 99% of people won't understand. If you enjoy asking questions and solving problems, you'll gain great satisfaction from a career in web development. From 2015 onwards, learning to code became part of the National Curriculum. Not only does that mean that the workforce of the future is already setting themselves apart, it also means that words like Java, Ruby and Python will start creeping their way into everyday conversations. Having a basic knowledge of coding will help ensure you're able to keep up. At the very least, it will mean you actually know what they're talking about.	**Year 11: Data Types** **Integer:** Whole numbers only. **Real:** Numbers that have a decimal part. **Boolean:** Can only take one of two values, usually true or false. **Character:** A single letter, number, symbol. **String:** Used to represent text, it is a collection of characters.	**Data Types** Integer Real Boolean Character String	**Operations** Addition Subtraction Multiplication Division Exponentiation Quotient Remainder	**Comparisons** Equal Less than Greater than

Challenge and Support:	Worldwide learning / links to 21st century:	Cultural capital/ Industry/ Enrichment:
This scheme of learning will enable students prior learning of coding to be reinforced through more detailed analysis of the information being used. Through using a Mirco:Bit students have the ability to easily switch between block coding and Python. Students can initially use the block coding to be introduced to computer programming. Once they understand the basics, they can begin learning the more complex Python programming language. Since the Micro:bit itself is so diverse, it can be used for any number of projects, from controlling LED lights to programming a system to sound an alarm when plants are in need of water. The A and B buttons on the Micro:bit also allow the device to become a mini game controller. This creates a great way for students to use an external device with online programs to learn about game design.	The Micro:bit offers students the ability to code, edit as well as project ideas for the Micro:bit minicomputer. This handheld minicomputer can be used to code games, animations, and more on its own or in conjunction with other devices. The Mirco:Bit offers a cost effective way for students to practically apply their previous coding skills. The subject runs an annual trip to the Oxford Mini Plant where students can see a fully automated assembly line. This offers students first hand experience of the current manufacturing facilities and helps to develop understanding of the roll coding plays in the 21st century. **Mini Plant Oxford;** https://www.youtube.com/watch?v=GcYKksx20ws&t=110s	To ensure that the content is relevant and up to date for our student's links have been made with the following to further develop the learning experience of our students. **Worldwide:** MSI Defence Systems Ltd: Norwich Mini Plant Oxford **Local:** East Norfolk Sixth Form College
Historical, Social, Moral, Spiritual, Cultural context:	**Cross curricular links/ literacy/numeracy:**	**Common misconceptions:**
Automation has taken the manufacturing industry by storm. Even in the years prior to the pandemic, many people worried about the effect of automation on the jobs of tomorrow. With a sharp increase in the use of robotics in the manufacturing industry, there is valid concern about how the future workforce will be shaped. Factories that employed hundreds, even thousands of employees now require only a fraction of that number due to increased automation. According to a recent study from 47% of U.S. jobs will be automated within the next 20 years. But what the study didn't address is that throughout history, as manufacturing processes evolved, so did jobs. When Henry Ford introduced the assembly line, jobs weren't lost - they evolved into better jobs. Instead of a crew building one car every 12.5 hours, the updated factory turned out a car every 93 minutes.	**Gatsby Benchmark:** https://www.bbc.co.uk/bitesize/articles/zfpjkmn https://www.bbc.co.uk/bitesize/articles/zhb4vk7 https://www.bbc.co.uk/bitesize/articles/zjnj382 **STEAM Ambassadors:** Students will be awarded a STEAM ambassador badges if they have been identified for doing exceptional work either academically or practically within this Design Technology curriculum. **Cross Curricular links:** **Maths:** Students are taught how to add, subtract, multiply and divide.	There is an image of coding as being boring, or not creative, which in reality isn't true at all. Coding is basically a tool to help you do what you want, so if you're interested in music, art, fashion, storytelling coding might be a way to help you solve certain problems, and build devices. Coding requires intelligence but more than that this it requires a willingness to learn, an ability to break down problems into smaller problems (decomposition) and perseverance. Everyone thinks differently and has a different way of approaching problems and diversity of opinion is really important when crafting solutions. The more diversity you have in a programming team the better.

As production increased, investments were made in more factories, leading to an even bigger increase in the jobs market and allowing more people access to more higher paying jobs. The assembly line was introduced to other industries as well, such as meat packing, which likewise benefitted from increased productivity. There was also a transition in agriculture during that time. Farming became more mechanized, requiring fewer laborers, which led people to shift from rural jobs to factories.

Assessment timeline:

GCSE computer Science covers a large array of different concepts. Through the AQA Specification these have been broken into 9 different units. Due to natural cross overs in content units have been simplified into 7 Units of work;

Unit 1: Computer Systems
Unit 2: Networks
Unit 3: Ethical, legal and environmental impacts
Unit 4: Fundamentals of data representation
Unit 5: Programming
Unit 6: Programming Project
Unit 7: Fundamentals of algorithms

Throughout subject knowledge delivery formative assessments take place throughout. These formative tests are in the form of class quizzes and are tracked throughout on the student assessment sheet within class folders. At the end of the unit delivery scheme of learning students take a test that amalgamates these tests into one large test. This data is recorded onto the front of student folders and informs teachers and students of subject knowledge retained. Students will be questioned during plenaries of lessons and will be asked to explain the previous lessons content at the start of the following lesson.

Through the use of Google Forms statistics are provided for teachers to identify specific areas of poor student knowledge retention. This information enables teachers amend teaching practice if required or enable more time to be given in its delivery.

Unit 4: Data Types	
Programming Basics	**20 marks**
Constants & Variables	**10 marks**
Strings	**10 marks**
Program Flow	**10 marks**
File Handling	**10 marks**
Storing Data	**10 marks**
Arrays	**10 marks**

Sub Programs	**10 marks**
End of Unit Assessment	**90 marks**

Home learning

Seneca is implemented as the home learning platform for AQA Computer Science. Retrieval practice means the repetition of subject content further supports classroom delivery if it happens at calculated intervals. Seneca learning platform does not only increase the students' engagement but has also scientifically proven to let students learn two times faster. Seneca covers AQA Computer Science with exam board specific questions and is written by senior examiners & industry experts. This coupled to student Google Classrooms enables assignments that show you the student's grade, study time and number of attempts.

Feedback

Computer Science uses subject specific front sheets to inform students of their academic achievements. These percentage scores demonstrate student attainment across specification units and enables students to focus on areas of weakness prior to Summative Assessment or MOCK exams.