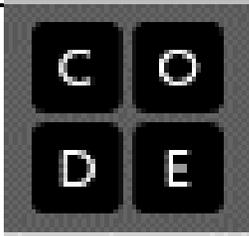


Computer Science

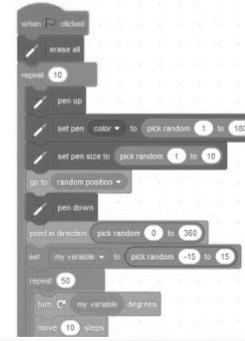
Year Group : 7



1. Programming Constructs – Using Code.Org (Block Based)

Students will explore the following programming constructs, whilst learning to use the block editor Scratch -

- Sequencing
- Variables
- Selection
- Count Controlled Iteration



Assessment Window 1

Assessment to cover the basics of Using Scratch.

Assessment Window 2

Assessment to cover Cyber Security



2. Cyber Security

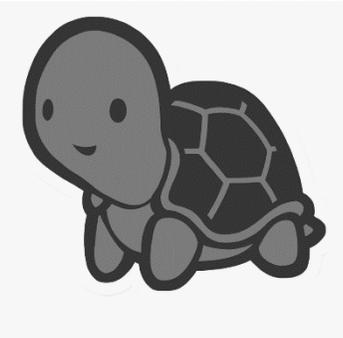
Students will learn about the following -

- How companies collect and use our data
- How to keep data safe online
- Different types of attacks people can face online
- How to avoid falling victim to cyber attacks

3. Programming Constructs – Using Small Basic (Text Based)

Students will build on their knowledge of programming constructs, transferring these from a block based language to a text based language. They will use Turtle Graphics to –

- Begin to code using a text based programming language
- Enhance their use of variables in coding
- Use count controlled iteration in the form of For... EndFor loops
- Look at the use of colours and their hexadecimal representation



Assessment Window 3

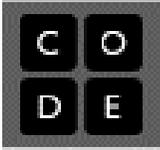
End of Year Exam covering all of the topics learnt throughout the year.

At every available opportunity, teachers will introduce and promote careers links to the topics being studied (See Careers booklets)

Computer Science: Year 7

Unit 1: Block Based Coding

1. Introduction to Programming and Sequencing



- What do we need to consider when writing a computer program?
- Importance of sequencing



2. Sequence and Variables

- What is a variable?
- How can we use these in our programs?

< > =
< > ≠

4. Operators

- Using operators within our programs to carry out calculations and make logical comparisons



3. Selection

- Making selections and choices within our programs

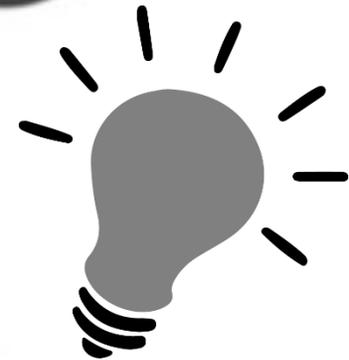
5. Count Controlled Iteration

- Repeating operations for a given number of times
- Use of For Loops



6. Problem Solving

- Using the skills we've learnt to write programs in order to solve given problems



Computer Science: Year 7

Unit 2: Cyber Security

1. You and Your Data

- Data vs Information
- How do companies collect and use our data?



2. Social Engineering

- Students will learn about different methods of social engineering



4. Malware

- Students will learn about different methods types of malware



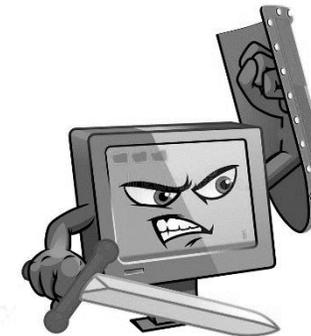
3. Computer Attacks

- Students will learn about different methods of computer attacks



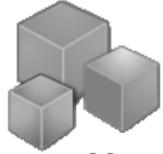
5. Protecting Yourself

- Weighing up threats vs potential damage
- What can we do protect ourselves from different types of attack



Computer Science: Year 7

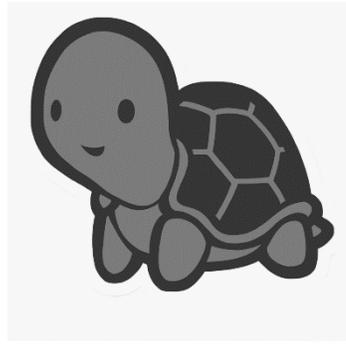
Unit 3: Using Small Basic



SmallBasic

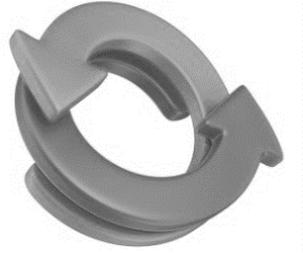
1. Introducing the Turtle

- Becoming familiar with the Turtle function
- Start programming to draw using the turtle



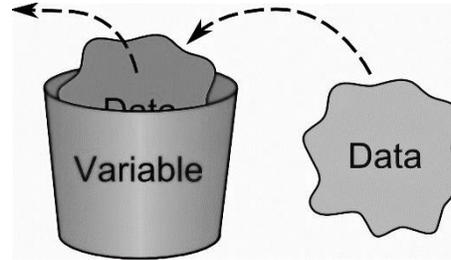
2. For Loops

- Using for loops to streamline our code



4. Using Variables

- Introduction to creating and using variables in Small Basic
- Using variables to create more interactive programs



3. The Text Window

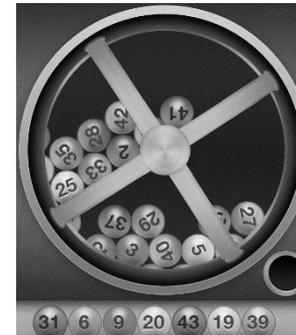
- Introduction to using the text function

Hello, World_



5. Conditions and Branching

- Using conditions within our code to create different 'paths' within our program

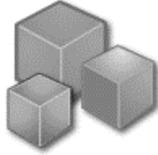


6. Using Random Numbers

- Using random number generation within our code

Computer Science

Year Group : 8



Small Basic

Spread the joy of programming

1. Programming Constructs – Modelling in Small Basic (Text Based)

Students will recap the core skills learnt during Year 7, and build on these to begin to model real life problems in Small Basic. This will involve...

- Using calculations
- Using loops
- Developing and Evaluating their models



Assessment Window 1

Assessment to cover the modelling in Small Basic.

Assessment Window 2

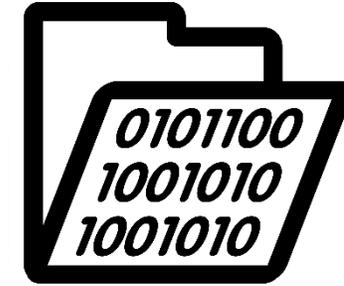
Assessment to cover Binary Representations



2. Binary Representations

Students will gain essential knowledge relating to binary representations. They will learn ...

- How to convert between binary and denary
- How to perform calculations in binary
- To understand the size of binary digits and what these represent



3. Computer Systems

Students will tour through the different layers of the computing system. This will include learning about...

- The hardware and components that make up a computer
- Operating Systems
- How programs are stored and executed



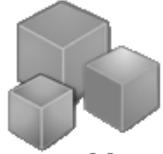
Assessment Window 3

End of Year Exam covering all of the topics learnt throughout the year.

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Computer Science: Year 8

Unit 1: Modelling in Small Basic



SmallBasic

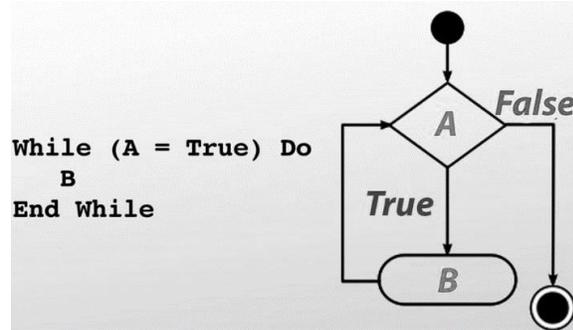
1. Small Basic Recap

- Refamiliarise with the Small Basic basics covered in year 7



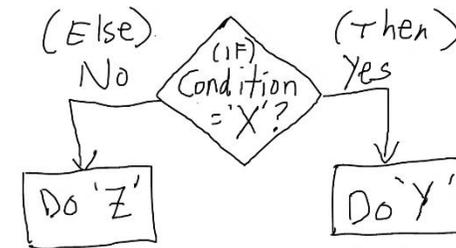
2. Calculations

- How to code mathematical operations
- How to use these in order to write programs to carry out calculations



4. Loops

- Using While Loops



3. Selection

- Using comparison operators
- If Then Else Statements

5. Developing the Model

- What are subroutines?
- Developing a model using subroutines



6. Evaluating the Model

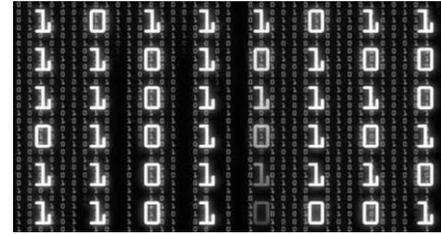
- What works well within the model?
- What could be improved in the model?

Computer Science: Year 8

Unit 2: Binary Representations

1. Binary Introduction

- What is binary?
- Why do computers use binary?
- Bits, Bytes ect.

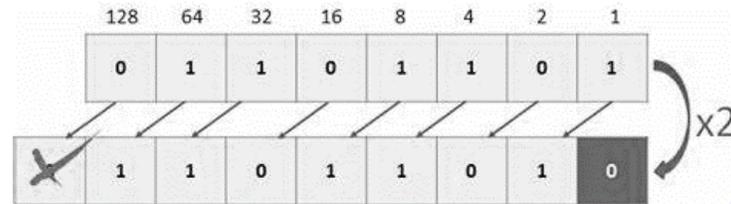


2. Binary Conversions

- Converting between binary and hexadecimal

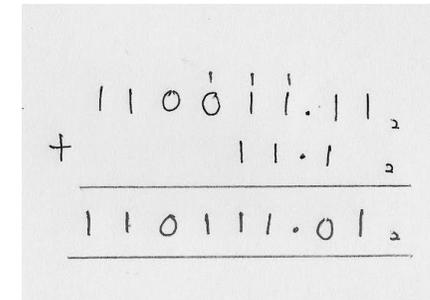
4. Binary Shifts

- Binary Multiplication
- Binary Division



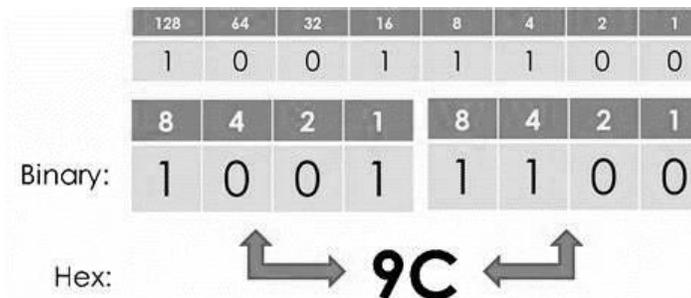
3. Binary Addition

- How to add binary numbers
- Overflow errors



5. Hexadecimal

- Introduction to hexadecimal
- Converting between binary, denary and hexadecimal



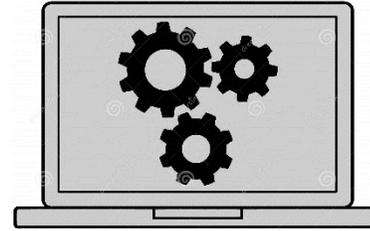
Computer Science: Year 8

Unit 3: Computer Systems

1. Get the Gear

Learn what the purpose of a computing system really is

- Explore what programs are, and look at specific examples of programs that we often use



2. Under the Hood

- Describe the hardware components used in computing systems and how they work together in order to execute programs
- Highlight how all computing systems, regardless of form, are similar in structure ('architecture')

4. It's Only Logical

- Describe three **logical operators**, and how they are used to form **logical expressions**
- Use **logic gates** to construct **logic circuits**, and associate these with logical operators and expressions
- Describe how hardware is built out of increasingly complex logic circuits



3. Orchestra Conductor

- Explore how the processor, main memory, and storage interact to execute programs in real scenarios
- Define what an operating system is, and provide an overview of what it does

5. Thinking Machines

- Define **artificial intelligence** and **machine learning**
- Explore examples of where they are being applied
- Teach a machine how to recognise different types of images
- Discuss moral issues associated with these technologies

