ICT KS3

CURRICULUM INTENT

It is the intention of the ICT curriculum to ensure that all students gain a broad range of digital skills to prepare them for the ever evolving digital world. It is our intention to ensure that students are aware and can protect themselves from harm when using digital equipment. Through learning about hardware and software students will be equipped to identify, select, compare and evaluate computer systems and networks. We aim to develop student understanding of spreadsheet models through learning about and applying a variety of functions and formula in real life situations. It is our aim to develop inquisitive learners with an appetite for problem solving. We aim to give the students all the skills needed to produce a game using a visual based programming language. s will be able to apply computational thinking in order to produce a fully working product.

ORMISTON FORGE ACADEMY

THRESHOLD CONCEPTS

TC1 Digital Communication – To understand the concept of communicating safely and effectively through technology.

TC2 Digital Collaboration – To actively collaborate with others through a range of digital mediums.

TC3 Digital Presentation – To identify and select the most appropriate tools to present information.

TC4 Logic – To understand the relationship between Logic and Mathematics using number bases.

TC5 Decomposition – To be able to look at a problem and decompose this into its component parts.

TC6 Abstraction – Be able to take the component parts and remove what is not needed.

TC7 Algorithm – Design and create algorithms for real world problems.

TC8 Pattern Recognition – To be able to identify different patterns in scenarios.

SUPPORT AT HOME

Exploring websites such as www.idea.org.uk or www.scratch.mit.edu

Talking about ICT in the real world

Supporting with homework

Download free alternatives to school software to use at home
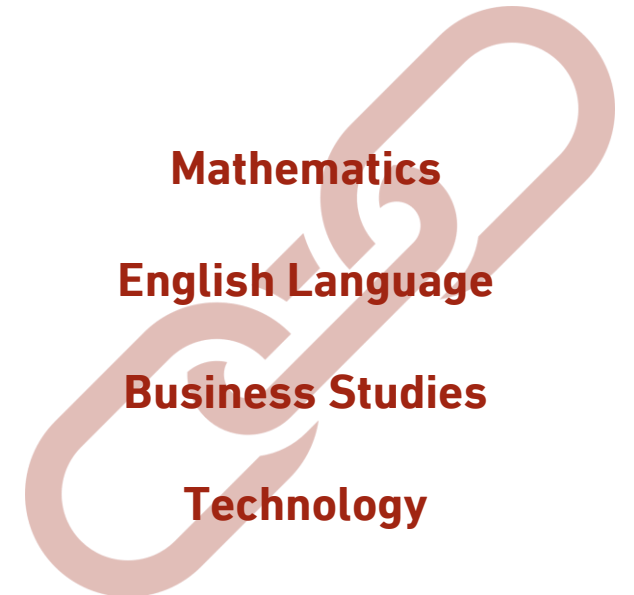
ENRICHMENT

Enrichment opportunities:

Trips linked to themes, Guest Speakers, After School Clubs

PERSONAL DEVELOPMENT

It is the intention of the ICT department to provide great opportunities for students to display key Forge values.

Throughout the curriculum, students are encouraged to show resilience when faced with challenges. Key strategies of computational thinking are transferable from subject to subject, and students will learn how to treat others respectfully when using digital devices and while being online through E-Safety.
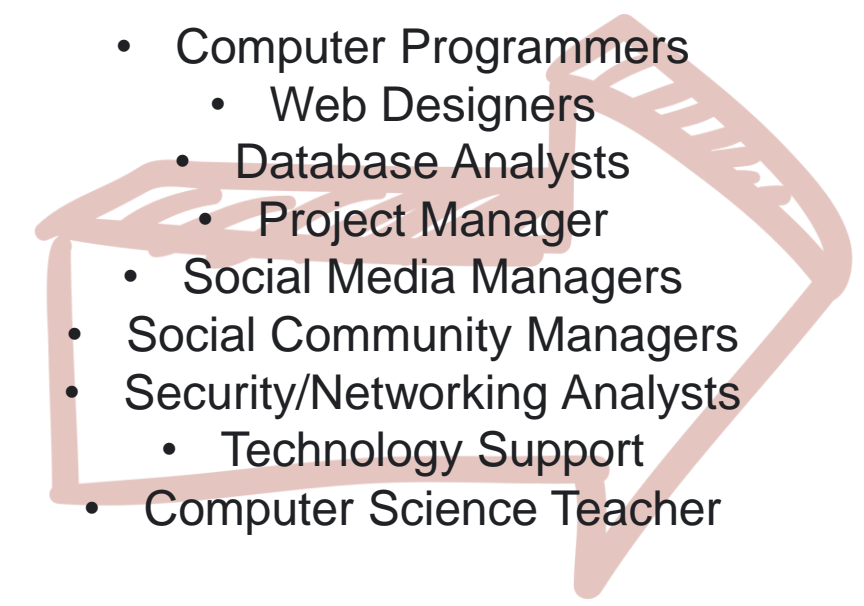
CURRICULUM LINKS

Mathematics

English Language

Business Studies

Technology

CAREERS

- Computer Programmers
- Web Designers
- Database Analysts
- Project Manager
- Social Media Managers
- Social Community Managers
- Security/Networking Analysts
- Technology Support
- Computer Science Teacher

ICT YEAR 7

AUTUMN HALF TERM 1: INTRODUCTION AND E-SAFETY

ORMISTON FORGE ACADEMY

THRESHOLD CONCEPTS :TC1, TC2

WHAT

Students will:
- learn how to log onto the school computer system.
- understand the importance of user and password security.
- learn how to access online storage, Microsoft apps and email.
- learn about social networks and their uses.
- understand the conecpt of personal information and being safe online.
  - understand cyberbullying, how to recognise the signs, and what to do in response to it.

WHY

- **To provide students with the skills to use technology safely.**
- **To provide students with the skills to use technology respectfully.**
- **To provide students with the skills to know how to use technology securely.**
- **So that students know the dangers of sharing personal information and how to best protect their online data and identity.**
- **To enable students to recognise and deal with inappropriate content, conduct and how to report concerns.**

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication.
Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.

VOCABULARY

- E-safety
- Cyberbullying
- Passwords
- Security
- Strong Password
- Malware
- Phishing
- Virus (Trojan/Worm)
- Troll

READING SKILLS

- **Reading for meaning**
- **Scanning**
- **Inference**
- **Summarising**

HALF TERM 2: HARDWARE AND SOFTWARE

THRESHOLD CONCEPTS :TC1, TC2, TC5

WHAT

Hardware and Software:

Students will:
- understand and explain the differences between input, output and storage devices.
- understand the technology that allows hardware to communicate with one another and other systems.
Understand the components that make up a computer system.
  - understand how instructions are stored and executed within computer systems.

WHY

- **To give students the ability to be able to explain the difference between input, output and storage device.**
- **To allow students to understand the technology that allows hardware to communicate with one another and other systems.**
- **To allow students to understand the components that make up a computer system**

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication.
Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.
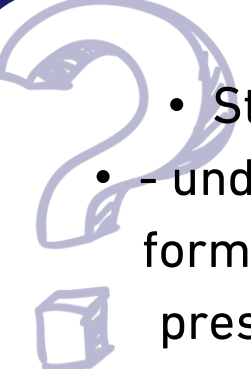
VOCABULARY

- Input
- Output
- Storage
- Networks
- WAN, LAN, PAN
- Bluetooth
- Connectivity
- Topologies

READING SKILLS

- **Reading for meaning**
- **Scanning**
- **Inference**
- **Summarising**

WHAT

- Students will:
- - understand how to format, analyse and present numerical data.
- - understand how to use a range of simple formulas and functions to summarise data.
- - understand how to summarise data using tables and charts.
- Be able to model information and make predictions.

WHY

- **To give students an understanding of how to format, analyse and present numerical data.**
- **To provide students with the knowledge to use a range of simple formulas and functions to summarise data.**
- **To provide students with the skills to summarise data using tables and charts.**

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication. Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.

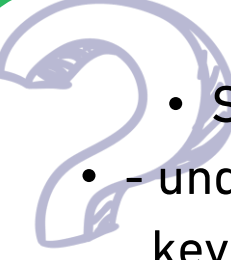***Mid point assessment in January**

VOCABULARY

- **Cell references**
- **Functions**
- **Formulae**
- **Formatting**

READING SKILLS

- **Reading for meaning**
- **Scanning**
- **Inference**
- **Summarising**

WHAT

- Students will:
- - understand and use key concepts when programming such as sequence, selection and iteration.
- Use control blocks to control sprites and select controls based on given scenarios.
- - understand and work with variables
- - create sequences of instructions and plan a solution to a problem.

WHY

- To allow students to have confidence in breaking down problems.
- To give students the knowledge of how to filter out aspects of a problem that aren't needed to solve a problem.
- to teach students the key concepts they need when programming such as sequence, selection and iteration
- to develop the students love of programming through the use of a visual based language
- to teach students the key concepts they need when programming
- to develop the students love of programming through the use of a visual based language
- to teach students the importance of testing products they create
- to teach students to use feedback to improve their products
- to teach students the importance of evaluation

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing; quality of written communication.
Students will also be assessed through: whole class feedback; live marking; quizzes; spelling tests for key words.

*End of year assessment window

VOCABULARY

- **Selection**
- **Sequence**
- **Variable**
- **Data Type**
- **Blocks**
- **Scratch**

READING SKILLS

- **Reading for meaning**
- **Scanning**
- **Inference**
- **Summarising**

ICT YEAR 8

AUTUMN

HALF TERM 1: DATA REPRESENTATION

THRESHOLD CONCEPTS :TC4, TC7

ORMISTON FORGE ACADEMY

WHAT

Students will:
- *understand how to convert from an 8-bit binary value to whole numbers.*
- *be able to convert from a whole number to a binary value.*
- *be able to add two 8-bit binary values together and explain the term overflow.*
- *use hexadecimal to make binary values easier to remember.*
- *use binary shifts to represent multiplication and division.*

WHY

To provide students with knowledge of what binary representation is and how it is used in computing

To provide students with the skills to convert between binary and denary

To provide students with the skills to convert between binary and hexadecimal

To provide students with the skills to confidently perform binary addition on bytes and can work with overflows

To enable students to perform binary shifts and know the purpose of both left and right shift

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication.
Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.

VOCABULARY

- Binary
- Denary
- Hexadecimal
- Addition
- Binary shift
- Overflow
- representation

READING SKILLS

- **Reading for meaning**
- **Scanning**
- **Inference**
- **Summarising**

HALF TERM 2: CYBER SECURITY

THRESHOLD CONCEPTS :TC1, TC2, TC6

WHAT

<u>Cyber Security:</u>

Students will:
- *understand different types of threats to networks.*
- *understand different types of threats to individuals.*
- *explain what is meant by each type of threat.*
- *understand the different types of prevention methods.*
- *identify which prevention method would be appropriate for each threat.*

WHY

- to teach students the different types of threats they may come across when online
- to teach students the key features of different threats
- to give students an understanding of the methods that can be used to prevent these threats

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication.
Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.

VOCABULARY

Threats - Internal & External
Prevention Methods
Impact
Features
Social Engineering
Malware

READING SKILLS

- **Reading for meaning**
- **Scanning**
- **Inference**
- **Summarising**

ICT YEAR 8

SPRING

HALF TERM 1: FLOW CHARTS

THRESHOLD CONCEPTS : TC5, TC6, TC7

ORMISTON FORGE ACADEMY

WHAT

Students will:
- *understand the types of symbols used when creating a flowchart and their meaning.*
- *be able to read a flowchart and predict outputs based on test data.*
- *apply computational thinking to problems and present a solution using an algorithm in the form of a flowchart.*

WHY

- To give students an understanding of the different ways algorithms can be used for us to solve problems.
- To enable students to be able to correctly draw a flowchart using the correct symbols
- To provide students with the knowledge to analyse a problem and produce a flowchart as a solution

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing; quality of written communication. Students will also be assessed through: whole class feedback; live marking; quizzes; spelling tests for key words.

*Mid point assessment in January

VOCABULARY

- Algorithm
- Flowchart
- Pseudocode
- Variables
- Decision / IF
- Loops
- Process
- Parallelogram

READING SKILLS

- Reading for meaning
- Scanning
- Inference
- Summarising

HALF TERM 2: PSEUDOCODE

THRESHOLD CONCEPTS :TC5, TC6, TC7

WHAT

Students will:
- *understand the key terms used when writing pseudocode.*
- *understand and use the basic commands in pseudocode.*
- *be able to read a piece of pseudocode and predict outputs based on test data.*
- *apply computational thinking to problems and present a solution using an algorithm in the form of a flowchart.*

WHY

- To give students an understanding of the different ways algorithms can be used for us to solve problems.
- To enable students to be able to correctly write pseudocodes using the correct syntax
- To provide students with the knowledge to analyse a problem and produce a pseudocode as a solution

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication. Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.

VOCABULARY

- Algorithm
- Flowchart
- Pseudocode
- Variables
- Inputs / Outputs

READING SKILLS

- Reading for meaning
- Scanning
- Inference
- Summarising

TERM 3: TEXT BASED PROGRAMMING

THRESHOLD CONCEPTS : TC5,TC6, TC7

ORMISTON **FORGE** ACADEMY

WHAT

Students will:
- develop confidence in breaking down problems.
- understand how to filter out aspects of a problem that aren't needed to solve the problem.
- produce solutions to problems through giving appropriate instructions in the format of a high-level language.
- understand concepts and terms such as decomposition, abstraction and algorithms.
- use the correct syntax when producing input and output statements.
- use data types and be able to explain the difference between each data type.
- use data types when working with variables to get a user to enter text, numbers and decimal numbers.
- show they can use string manipulation to change the look of a string.
- use IF statements to make decisions and output certain information depending of the input of a user.

WHY

- To allow students to have confidence in breaking down problems.
- To give students the knowledge of using basic commands in Python
- To enable students to use the correct syntax to enter codes into Python
- To give students the knowledge of how to interpret problem and write simple programs as a solutions
- To enable students to confidently identify and correct errors in a given program in Python

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing; quality of written communication. Students will also be assessed through: whole class feedback; live marking; quizzes; spelling tests for key words.
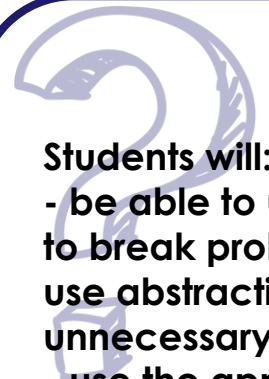
*End of year assessment window

VOCABULARY

- Algorithm
- Flowchart
- Pseudocode
- Variables
- Decision / IF
- Loops
- Process
- Parallelogram

READING SKILLS

- **Reading for meaning**
- **Scanning**
- **Inference**
- **Summarising**

SPRING TERM 2: TEXT BASED PROGRAMMING

ORMISTON FORGE ACADEMY

THRESHOLD CONCEPTS :TC4, TC5, TC7

WHAT

Students will:
- be able to use decomposition to break problems down and use abstraction to remove unnecessary detail.
- use the appropriate syntax to produce solutions to a range of problems.
- understand and use subject specific terminology in relation to text-based programming.
- be confident in using sequence, selection and iteration.
- be able to use string manipulation techniques and slicing to change the way a string looks and to view particular elements of a string.
- use IF statements to make decisions while using the correct syntax that makes use of IF, ELIF and ELSE.
- use FOR loops and WHILE loops to repeat sections of code.

WHY

To allow students to develop their understanding of a high-level language.

To apply computational thinking and create algorithms to solve problems.

To design, create, test and refine programs for a given real-life scenario.

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication.
Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.

*Mid point assessment in January

VOCABULARY

High-level language
Abstraction
Decomposition
IDE
Algorithm
Testing
Syntax
Logical
Python

READING SKILLS

- Reading for meaning
- Scanning
- Inference
- Summarising

ICT YEAR 9

AUTUMN

HALF TERM 1: SORTING ALGORITHMS

THRESHOLD CONCEPTS :TC5, TC6, TC7

ORMISTON FORGE ACADEMY

WHAT

Students will:
- understand the sorting algorithms needed to allow a computer to put data in a logical order.
- understand how to search for a specific value when given a set of data.
- be able to use the following sorting algorithms to put data in ascending and descending order: *merge, insertion and bubble.*
- be able to use the following searching algorithms to search for a given value: *linear and binary.*
- understand subject specific terminology in relation to searching and asorting algorithms.

WHY

- To provide students with an understanding of different ways in which computers sort data
- To provide students with the skills to correctly use merge, insertion and bubble sort algorithms
- To provide students with the skills to correctly use linear and binary searches on given data

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication.
Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.

VOCABULARY

- Algorithm
- Merge sort
- Insertion sort
- Bubble sort
- Linear search
- Binary search

READING SKILLS

- Reading for meaning
- Scanning
- Inference
- Summarising

HALF TERM 2: INTERFACE DESIGN

THRESHOLD CONCEPTS : TC2, TC3, TC5

WHAT

Students will:
- *develop their understanding of a range of user interfaces including:* Graphical User Interfaces, Menu Interfaces and Command Line Interfaces.
- understand the design principles that make an effective interface.
  develop their PowerPoint skills in order to create a simple interface.
- evaluate the interface they produce and use feedback to inform improvements.

WHY

To provide students with the knowledge of different types of user interfaces
To provide students with the skills to create an interface
To provide students with the understanding of how interfaces can be adapted to suit different accessibility needs

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing;quality of written communication.
Students will also be assessed through: whole class feedback; live marking; quizzes;spelling tests for key words.

VOCABULARY

- Menu
- Command line interface
- Graphical user interface
- Accessibility
- Impairment
- Visual
- Auditory

READING SKILLS

- Reading for meaning
- Scanning
- Inference
- Summarising

ICT YEAR 9

SUMMER

HALF TERM 1: IMAGE REPRESENTATION

ORMISTON FORGE ACADEMY

THRESHOLD CONCEPTS: TC1, TC2, TC3, TC4, TC5, TC6, TC7

WHAT

Students will:
- understand how to calculate the file size of an image when given the height, width and bit depth.
- calculate the quantity of colours that can be represented in a given bit depth.
- show how an image is represented in binary.
- produce simple bitmap images and understand how they differ from vector.

WHY

To understand the difference between bitmap and vector images.

To understand how images are represented.

To show how to calculate the bit depth of an image and the number of colours that can be represented.

To calculate an approximate file size of an image.

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing; quality of written communication.

Students will also be assessed through: whole class feedback; live marking; quizzes; spelling tests for key words.

VOCABULARY

Bit Map
Vector
Compression
Bit Depth
Resolution
Pixels
Metadata

READING SKILLS

- Reading for meaning
- Scanning
- Inference
- Summarising

HALF TERM 2: DATABASES

THRESHOLD CONCEPTS TC1, TC2, TC4, TC6, TC7.

WHAT

Students will:
- understand how to create basic tables.
- understand the different data types and will be able to explain when they should be used.
- be able to produce a query to search through a set of data.
- be able to produce reports to showcase a set of data.

WHY

To give students an understanding of how data is stored, processed and retrieved.

To allow students to understand how we can search for data.

To give students the skills of how to produce their own database for a given purpose.

HOW

ASSESSMENT

How students will be assessed: do now tasks; class task sheets; end of unit tests; evaluative writing; quality of written communication.

Students will also be assessed through: whole class feedback; live marking; quizzes; spelling tests for key words.

*End of year assessment window

VOCABULARY

Database
Field
Record
Primary Key
Queries
Relationships
Reports
Forms

READING SKILLS

- Reading for meaning
- Scanning
- Inference
- Summarising