



Dallam School

Curriculum Overview

Department: Computer Science
Year Group: 7

AUTUMN

SPRING

SUMMER

Half term 1

Half term 2

Half term 3

Half term 4

Half term 5

Half term 6

Theme/ topic:

Introduction, What is a Computer

Theme/ topic:

Thinking like a Computer Scientist - Beginner

Theme/ topic:

Spreadsheet modelling

Theme/ topic:

Programming in BYOB

Theme/ topic:

Micro bit programming

Theme/ topic:

Web Basics

By the end of this half term pupils will know (key knowledge, including tier 3 vocabulary):

You will learn how to use the school network, save your files and how to use Office 365 to collaborate.

What is a Computer – You will learn about the components of a modern Computer, how they fit together and how we classify devices.

Tier 3 Vocabulary

- CPU
- RAM
- Peripheral device
- Secondary Storage
- Server
- Client

Learn to how to think like a Computer Scientist, developing computational thinking approaches; which you can apply across a variety of subjects to become a logical & analytical thinker. You will study existing algorithms and problem solving techniques which govern many aspects of your digital life & begin to evaluate their efficiency.

Tier 3 Vocabulary

- Abstraction
- Decomposition
- Pattern recognition
- Algorithm

How Computer Scientists can use spreadsheets to model scenarios and create working models that mimic the an output based on an input from a user.

Tier 3 Vocabulary

- Cell
- Formula
- Function
- Autofill
- Data type

You will continue to develop your problem solving and programming skills in BYOB and design your own computer game.

Tier 3 Vocabulary

- Variable
- Iteration
- Sequence
- Selection
- Sprite

You will learn how to program a BBC micro bit to overcome a series of challenges and then design, develop and test a program of your own.

Tier 3 Vocabulary

- Variable
- Iteration
- Sequence
- Selection
- List
- Pixel
- Accelerometer
- Hexadecimal
- compile

- You will learn how to create a simple website using HTML. Your site will have links, images buttons.

Tier 3 Vocabulary

- Hexadecimal
- Container Tag
- Empty Tag
- Marquee
- Server
- Host
- Hyper link
- Cookie

They will understand (key concepts):					
<p>What are multifunctional devices and how convergence has reshaped modern technology. Effective digital communication.</p>	<p>How abstraction, decomposition, pattern recognition and algorithmic thinking can be applied to solve problems.</p>	<p>How to make use of formula and functions to perform basic arithmetic calculations and model scenarios.</p>	<p>How abstraction, decomposition, pattern recognition and algorithmic thinking can be applied to program solutions in a visual language. The role basic programming structures sequence, selection and iteration play in programming.</p>	<p>How abstraction, decomposition, pattern recognition and algorithmic thinking can be applied to program solutions on the BBC Microbit. The role basic programming structures sequence, selection and iteration play in programming and how to store data in a variable.</p>	<p>The purpose of the WWW. A basic understanding of how data is transferred over a network. The practical application of a text based programming language in the creation of webpages.</p>
They will know how to (key skills including speaking, reading and writing in this subject):					
<p>I can come up with a secure password. I can log on. I can create files & folders with sensible file names. I can log onto Office 365. I can log onto Office 365 from outside of school. I know how to stay safe online and what to do if I have concerns. I can favourite a site on SharePoint. I can send an email. I can send an email with a subject and attachment. I can share a document on office 365.</p>	<p>I can solve simple problems using brute force techniques. I can solve simple problems using trial and error to learn from mistakes. I know an algorithm is a set of steps used to complete a task can be represented as flow charts or as a list of instructions. I know there are several algorithms that may solve the same problem. I know some algorithms are more efficient than others.</p>	<p>I can enter data into a spreadsheet. I can change column and row width to accommodate data. I can use formatting techniques such as borders and fill to enhance the appearance of spreadsheets. I can complete simple formula such as addition, subtraction, division and multiplications</p>	<p>I can follow instructions to add scripts to an existing sprite. I can define the word algorithm I can draw flow charts to help solve problems. I can write my own algorithms. I can add my own scripts to an existing sprite. I can define the word sequence and point</p>	<p>I can create scripts, which run in a sequence. I can create scripts, which make use conditional statements to determine how my program reacts to input. I can create scripts, which make use of iteration to make my coding more efficient. I can create sensible variable names and use them to store data</p>	<p>I can select and launch an internet browser. I understand webpages must be populated with information and updated by a developer. I am aware of the impact my digital footprint may have on my future and what. I understand the importance of communicating safely & respectfully online and I what to do if I have concerns. I am able to search the web using a search engine and navigate webpages.</p>

<p>I can collaborate on Office 365. I can upload documents to office 365 . I can view my progress on Office 365 and respond to feedback. I can select software for a given purpose and explain why i have chosen it. I can explain the advantages of networks & why they are used.</p>	<p>I can define the term decomposition. I can define the term pattern recognition. I can define the term abstraction. I can define the term algorithmic thinking. I can systematically test solutions to problems to make sure I am right. I know the difference between “brute force” & “divide & conquer”. I can use decomposition to break problems down into smaller parts & make them easier to solve. I can use abstraction to remove unnecessary detail from a problem and make it easier to solve. I can use algorithmic thinking to come up with a set of steps to solve a problem. I can use all of the correct symbols of a flow chart to represent the solution to a problem. I can use pseudocode to represent solutions to problems I am able to apply computational thinking techniques to new problems and across subjects.</p>	<p>and know the symbols for these. I can use functions such as SUM, MIN, MAX & AVERAGE and understand how these make complex formula more efficient. I can create graphs, which have been fully labelled and are correct for the context. I can name ranges of cells and make use of these within formula. I understand BIDMAS and the use impact this has on formula output. I can change data in model scenarios and answer questions. I can use formula, which make use of multiple worksheets to store and retrieve data. I can apply mathematical knowledge to formula to perform modelling scenarios</p>	<p>to examples in scratch. I can create scripts which run in a sequence I can change sprite costumes using scripts to enhance my programs. I can spot errors in code and predict what will go wrong. I can explain the word iteration and point to examples in scratch. I can create scripts, which make use of iteration to make my coding more efficient. I can systematically test my program to eliminate bugs and show it is robust. I can make use of indentation in algorithms design. I can explain the difference between logic and syntax errors.</p>	<p>for later use in a program. I can come up with success criteria to determine my programs aims. I can make use of random numbers to make output unpredictable. I can systematically test my program to eliminate bugs and show it is robust. I can create programs which handle strings, integers and real numbers. I can use operators such as >, = & < to make comparisons between variables and user input within my programs. I can create nested IF statements within programs so that multiple criteria is met before code is run. I can create programs which join operators with Boolean logic such as AND, OR and NOT.</p>	<p>I can use web apps to share and manipulate content. I know what a cookie is and how it impacts content I view online. I can explain the difference between the world wide web and the internet. I can organise and present data, making use of feedback received to improve and evaluate work. I can use HTML to create a single web page and use different tags such as <p>
 <h1> to format content. I can collect information and content using advanced search techniques and Boolean operators such as AND, OR & NOT. I understand the difference between physical and wireless networks and can name equipment needed. I have made a site, which contains several webpages using HTML, which are linked together and make use of formatting tags and hexcodes to change colours. I have used CSS to improve the efficiency of my webpage design. I have used Java Script to add interactivity to my webpage.</p>
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	<p>I can calculate best & worst case scenario comparisons. I can compare algorithm efficiency using Big O notation.</p>	<p>such as percentage increase or decrease.</p> <p>I can use absolute cell referencing to improve formula efficiency.</p> <p>I can use goal seek to improve the efficiency of spreadsheet modelling.</p> <p>I can use conditional formatting to enhance cells which meet or do not meet certain criteria using the >, < and = operators.</p> <p>I can create IF functions to give the user feedback on cell content.</p>		<p>I can make use of indentation and underline variables when designing algorithms.</p>	
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Dallam School

Curriculum Overview

Department: Computer Science
Year Group: 8

AUTUMN		SPRING		SUMMER	
Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Theme/ topic: App development	Theme/ topic: Thinking like a Computer Scientist - Junior	Theme/ topic: Data representation	Theme/ topic: Algorithms	Theme/ topic: Micro Python	Theme/ topic: Blender
By the end of this half term pupils will know (key knowledge, including tier 3 vocabulary):					
<p>– You will use the code.org code lab app to create your own app, which can be accessed on a mobile device.</p> <p>Tier 3 Vocabulary</p> <ul style="list-style-type: none"> • Variable • Iteration • Sequence • Selection • Application • Portability • Platform • Aesthetics • User interface 	<p>Learn to how to think like a Computer Scientist, developing computational thinking approaches; which you can apply across a variety of subjects to become a logical & analytical thinker. You will study existing algorithms and problem solving techniques which govern many aspects of your digital life & begin to evaluate their efficiency.</p> <p>Tier 3 Vocabulary</p> <ul style="list-style-type: none"> • Abstraction • Decomposition 	<p>You will learn about the Binary & hexadecimal number systems underpinning Computer Science as well as the way in which images, sound and video are represented and stored digitally.</p> <p>Tier 3 Vocabulary</p> <ul style="list-style-type: none"> • Number base • Binary • Denary • Hexadecimal • Bit • Byte • Nibble • Kb • Mb 	<p>You will learn about some of the key searching and sorting algorithms that make many of our daily digital interactions possible.</p> <p>Tier 3 Vocabulary</p> <ul style="list-style-type: none"> • Binary Search • Linear Search • Bubble Sort • Insertion sort • Count occurrence • Algorithm • Brute force • Divide and conquer 	<p>You will learn how to program a BBC Micro: bit to communicate with other devices, take digital readings, display results and create images.</p> <p>Tier 3 Vocabulary</p> <ul style="list-style-type: none"> • Variable • Count controlled loop • Condition controlled loop • Sequence • Selection • 2D array • 3D array 	<p>You will learn how to create 3D models and animations using Blender animation software.</p> <p>Tier 3 Vocabulary</p> <ul style="list-style-type: none"> • Render • Tween • Stop frame • Vertex • Face • Edge • Parenting • Organic modelling • Subdivision

	<ul style="list-style-type: none"> • Pattern recognition • Algorithm 	<ul style="list-style-type: none"> • Gb 		<ul style="list-style-type: none"> • Pixel • Compile • Syntax • Logic 	
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They will understand (key concepts):

How abstraction, decomposition, pattern recognition and algorithmic thinking can be applied to program solutions in a visual language and create mobile apps. The role basic programming structures sequence, selection and iteration play in programming.	How abstraction, decomposition, pattern recognition and algorithmic thinking can be applied to solve problems.	How data is represented in the digital world, why this is the case. How we perform calculations in number bases uses by Computer Scientists. You will learn how to calculate file sizes.	Gain an insight into existing algorithms which govern many aspects of your digital life and learn to evaluate their efficiency.	How to execute our first Python programs on the micro:bit using simple coding patterns. Explore micro:bit hardware components and experiment with examples of using the micro:bit's General-Purpose Input Output (GPIO) pins to connect it to external hardware components, such as LEDs and speakers	The role 3D modelling plays in developing and testing solutions. The importance of planning, design and testing in 3D animation.
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They will know how to (key skills including speaking, reading and writing in this subject):

The role user interface design plays in app development. The ability to apply computational thinking techniques to the programming of a mobile APP. The importance of testing.	I can solve simple problems using brute force techniques. I can solve simple problems using trial and error to learn from mistakes. I know an algorithm is a set of steps used to complete a task can	I understand computers consist of transistors. I understand electrical signals that pass through transistors can are represented in binary as a 1 or 0.I can	I know the three computational thinking techniques: decomposition, abstraction, and algorithmic thinking. I can apply these techniqueswhen solving a wide range	I can create code, which run in a sequence. I can create code which makes allows user input and stores this in a variable.	I can point to examples of where 3D animation is used.. I can give reasons for why 3D animation is used. I can define the term Open Source software.
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<p>be represented as flow charts or as a list of instructions. I know there are several algorithms that may solve the same problem. I know some algorithms are more efficient than others. I can define the term decomposition. I can define the term pattern recognition. I can define the term abstraction. I can define the term algorithmic thinking. I can systematically test solutions to problems to make sure I am right. I know the difference between "brute force" & "divide & conquer". I can use decomposition to break problems down into smaller parts & make them easier to solve. I can use abstraction to remove unnecessary detail from a problem and make it easier to solve. I can use algorithmic thinking to come up with a set of steps to solve a problem. I can use all of the correct symbols of a</p>	<p>convert denary/decimal into 4 bit binary. I can convert 4 bit binary into denary/decimal. I can convert denary/decimal into 8 bit binary. I can convert 8 bit binary into denary/decimal. I understand how a bit map is represented. I can calculate the size of a bit map file. I understand how sound is represented. I can calculate the file size of a sound file. I can convert Hexadecimal number into denary/decimal.</p>	<p>of problems, both computer-based and in their everyday lives I can develop flow charts using BCS symbols. I know one of two searching algorithms we need to know about: linear search. I can carry out a linear search, and perform a linear search in real life and with a sample of data. I know the second of two searching algorithms we need to know about: binary search I can carry out a binary search and perform a binary search with playing cards and with a sample of data.</p>	<p>I can define the term variable. I can create scripts, which make use of iteration to make my coding more efficient. I can create sensible variable names and use them to store data for later use in a program. I can define the data types strings, integers and real numbers. I can predict program output when given basic code examples I can systematically test my program to eliminate bugs and show it is robust. I can create programs, which handle strings, integers and real numbers. I can use operators such as >, = & < to make comparisons between variables and user input within my programs.</p>	<p>I can scale, rotate & move objects in Blender. I can define the terms face, vertex & edge. I can describe the relationship between number of faces & power needed for a computer to run an animation. I can colour objects in Blender. I can describe how stop frame animation works. I can give objects in Blender sensible names. I can create simple animations using key frame animation in Blender. I can navigate the animation timeline to stop, play and pause animations. I join multiple objects together using parenting. I can explain why key frame animation is used rather than stop frame animation. I can use edit mode, loop cut, face addition & extrude in Blender animations. I can apply different colours to different parts of the same model.</p>
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flow chart to represent the solution to a problem.
I can use pseudocode to represent solutions to problems
I am able to apply computational thinking techniques to new problems and across subjects.
I can calculate best & worst case scenario comparisons.
I can compare algorithm efficiency using Big O notation.

I can use selective statements within programs which tests multiple criteria is met before code is run.

I can create programs which join operators with Boolean logic such as AND, OR and NOT.

I know the difference between a count controlled and condition controlled loop and can select the appropriate one for a given problem.

I can use abstraction, decomposition & pattern recognition to design and code my own solutions to simple problems.

I can use complex data structures such as arrays to store multiple pieces of data under one heading.

I can make use of subprograms within my code to make it more efficient.

I understand the principle of organic modelling and the role symmetry plays in this.

I can use the use the knife tool and subdivision to create realistic organic models.

I can alter the lens, lights and set appropriate composition on my animations before I render them.

I can use all of the listed techniques to create my own 3d model.



Dallam School

Curriculum Overview

Department: Computer Science
Year Group: 9

AUTUMN

SPRING

SUMMER

Half term 1

Half term 2

Half term 3

Half term 4

Half term 5

Half term 6

Theme/ topic:

Theme/ topic:

Theme/ topic:

Theme/ topic:

Theme/ topic:

Theme/ topic:

App development

Thinking like a Computer Scientist - Intermediate

Python 101

Data representation & Boolean Logic

Cyber Security

Data Science & Digital wellbeing

By the end of this half term pupils will know (key knowledge, including tier 3 vocabulary):

App Development – You will design, develop and create an app for an end user.

Learn to how to think like a Computer Scientist, developing computational thinking approaches; which you can apply across a variety of subjects to become a logical & analytical thinker. You will study existing algorithms and problem solving techniques which govern many aspects of your digital life & begin to evaluate their efficiency.

Tier 3 Vocabulary

- Abstraction

You will put your problem solving techniques to the test designing, creating & testing Python programs which solve real work problems.

Tier 3 Vocabulary

- Variable
- Count controlled loop
- Condition controlled loop
- Sequence
- Selection
- Translator
- Interpreter

You will learn how data is represented within your computer at a fundamental level.

Tier 3 Vocabulary

- Logic gate
- Transistor
- Binary
- Not
- And
- Or

You will learn about cyber security threats, the legal and ethical consequences of cyber attacks and how they can be mitigated.

Tier 3 Vocabulary

- Anti malware
- Virus
- Trojan
- DDOS
- Pen Testing
- Brute force
- Phishing
- Hacker

You will look how “big data” is used to predict outcomes and how you can look after your own digital wellbeing.

Tier 3 Vocabulary

- Digital footprint
- Cookie
- AI
- Machine learning
- Botnet
- Reliability
- Validity

	<ul style="list-style-type: none"> • Decomposition • Pattern recognition • Algorithm 	<ul style="list-style-type: none"> • Syntax • Logic • Comparison operator • Assignment 		<ul style="list-style-type: none"> • Firewall • Encryption • SQL injection 	
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They will understand (key concepts):

<p>The impact of user interface design on the usability of apps.</p> <p>The application of computational thinking approaches in coding a mobile app.</p>	<p>Abstraction, decomposition, pattern recognition and algorithmic thinking.</p>	<p>How to create text based coding solutions to small problems that make use of sequence selection and iteration. The importance of data types and their application in programming.</p>	<p>Why Computers represent data as binary and how to convert between number bases.</p> <p>How images, videos and sound are stored by a Computer.</p>	<p>Learn about the cyberthreats posed to a network, followed and an exploration of some common methods of defending the network against attacks. Know about the available career choices in cyber defence.</p>	<p>Why our data is valuable to others and why it is important to keep it safe. What data companies, such as social media platforms, collect about us and what they use it for. How the law tries to keep our data safe</p>
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They will know how to (key skills including speaking, reading and writing in this subject):

	<p>I can solve simple problems using brute force techniques.</p> <p>I can solve simple problems using trial and error to learn from mistakes.</p> <p>I know an algorithm is a set of steps used to complete a task can be represented as flow</p>	<p>I can create code, which run in a sequence.</p> <p>I can create code which makes allows user input and stores this in a variable.</p> <p>I can define the term variable.</p>	<p>I understand computers consist of transistors.</p> <p>I understand electrical signals that pass through transistors can are represented in binary as a 1 or 0.I can convert</p>		<p>I can create code, which run in a sequence.</p> <p>I can create code which makes allows user input and stores this in a variable.</p> <p>I can define the term variable.</p> <p>I can create scripts, which make use of iteration to make my coding more efficient.</p>
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	<p>charts or as a list of instructions. I know there are several algorithms that may solve the same problem. I know some algorithms are more efficient than others. I can define the term decomposition. I can define the term pattern recognition. I can define the term abstraction. I can define the term algorithmic thinking. I can systematically test solutions to problems to make sure I am right. I know the difference between “brute force” & “divide & conquer”. I can use decomposition to break problems down into smaller parts & make them easier to solve. I can use abstraction to remove unnecessary detail from a problem and make it easier to solve. I can use algorithmic thinking to come up with a set of steps to solve a problem. I can use all of the correct symbols of a flow chart to represent</p>	<p>I can create scripts, which make use of iteration to make my coding more efficient. I can create sensible variable names and use them to store data for later use in a program. I can define the data types strings, integers and real numbers. I can predict program output when given basic code examples I can systematically test my program to eliminate bugs and show it is robust. I can create programs, which handle strings, integers and real numbers. I can use operators such as >, = & < to make comparisons between variables and user input within my programs. I can use selective statements within programs which tests multiple criteria is</p>	<p>denary/decimal into 4 bit binary. I can convert 4 bit binary into denary/decimal. I can convert denary/decimal into 8 bit binary. I can convert 8 bit binary into denary/decimal. I understand how a bit map is represented. I can calculate the size of a bit map file. I understand how sound is represented. I can calculate the file size of a sound file. I can covert Hexadecimal number into denary/decimal. I know logic gates allow electrical signals to be manipulated in order to perform calculations. I can draw the diagram for three logic gates, AND, OR and NOT.</p>		<p>I can create sensible variable names and use them to store data for later use in a program. I can define the data types strings, integers and real numbers. I can predict program output when given basic code examples I can systematically test my program to eliminate bugs and show it is robust. I can create programs, which handle strings, integers and real numbers. I can use operators such as >, = & < to make comparisons between variables and user input within my programs. I can use selective statements within programs which tests multiple criteria is met before code is run. I can create programs which join operators with Boolean logic such as AND, OR and NOT. I know the difference between a count controlled and condition controlled loop and can select the appropriate one for a given problem. I can use abstraction, decomposition & pattern recognition to design and code my own solutions to simple problems.</p>
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	<p>the solution to a problem. I can use pseudocode to represent solutions to problems I am able to apply computational thinking techniques to new problems and across subjects. I can calculate best & worst case scenario comparisons. I can compare algorithm efficiency using Big O notation.</p>	<p>met before code is run.</p> <p>I can create programs which join operators with Boolean logic such as AND, OR and NOT.</p> <p>I know the difference between a count controlled and condition controlled loop and can select the appropriate one for a given problem.</p> <p>I can use abstraction, decomposition & pattern recognition to design and code my own solutions to simple problems.</p> <p>I can use complex data structures such as arrays to store multiple pieces of data under one heading.</p> <p>I can make use of subprograms within my code to make it more efficient.</p>	<p>I can complete the truth tables for the logic gates, AND, OR and NOT.</p> <p>I s for the logic gates, AND, OR and NOT.</p>		<p>I can use complex data structures such as arrays to store multiple pieces of data under one heading.</p> <p>I can make use of subprograms within my code to make it more efficient.</p>
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