Year 1 Computing Progression in Skills and Knowledge

NC Knowledge and Computational Skills
Autumn 1 Computing systems and networks - Technology around us (1.1)* - recognising technology in school and using it responsibly
National curriculum links • Recognise common uses of information technology beyond school • Use technology purposefully to create, organise, store, manipulate, and retrieve digital content • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. **Education for a Connected World links** **Health, well-being and lifestyle** • I can identify rules that help keep us safe and healthy in and beyond the home when using technology • I can give some simple examples **Copyright and ownership** • I know that the work I create belongs to me • I can name my work so that others know it belongs to me **Unit objectives:** 1. To identify technology 2. To identify a computer and its main parts 3. To use a mouse in different ways 4. To use a keyboard to type on a computer 5. To use the keyboard to edit text 6. To create rules for using technology responsibly
Autumn 2 Creating media A - Digital painting (1.2) - choosing appropriate tools in a program to create art, and making comparisons with working non-digitally
National curriculum links **KS1 Computing** • Use technology purposefully to create, organise, store, manipulate, and retrieve digital content **(Cross curricular link: KS1 Art and Design** • To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form, and space • About the work of a range of artists, craft makers, and designers, describing the differences and similarities between different practices and disciplines and making links to their own work) **Unit objectives:** 1. To describe what different freehand tools do 2. To use the shape tool and the line tools 3. To make careful choices when painting a digital picture 4. To explain why I chose the tools I used

5. To use a computer on my own to paint a picture
6. To compare painting a picture on a computer and on paper

Spring 1 **Programming A -** Moving a robot (1.3)

- writing short algorithms and programs for floor robots, and predicting program outcomes

National curriculum links

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- Create and debug simple programs
- Use logical reasoning to predict the behaviour of simple programs
- Recognise common uses of information technology beyond school

Unit objectives:

1. To explain what a given command will do
2. To act out a given word
3. To combine forwards and backwards commands to make a sequence
4. To combine four direction commands to make sequences
5. To plan a simple program
6. To find more than one solution to a problem

Spring 2 **Data and information** Grouping data (1.4)

- exploring object labels, then using them to sort and group objects by properties

National curriculum links

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content
- Use technology safely and respectfully

Education for a Connected World links

Copyright and ownership

- I know that work I create belongs to me (Y1)
- I can name my work so that others know it belongs to me (Y1)

Unit objectives:

1. To label objects
2. To identify that objects can be counted
3. To describe objects in different ways
4. To count objects with the same properties
5. To compare groups of objects
6. To answer questions about groups of objects

Summer 1 **Creating media B** Digital writing (1.5)

- using a computer to create and format text, before comparing to writing non-digitally

National curriculum links

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content
- Use technology safely and respectfully, keeping personal information private

Education for a Connected World links

Privacy and security

- I can give reasons why I should only share information with people I choose to and can trust. (Y1)

Unit objectives:

1. To use a computer to write
2. To add and remove text on a computer
3. To identify that the look of text can be changed on a computer
4. To make careful choices when changing text
5. To explain why I used the tools that I chose
6. To compare writing on a computer with writing on paper

Summer 2 **Programming B** Programming Animations (1.6)

- designing and programming the movement of a character on screen to tell stories

National curriculum links

- Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- Create and debug simple programs
- Use logical reasoning to predict the behaviour of simple programs

Unit objectives

1. To choose a command for a given purpose
2. To show that a series of commands can be joined together
3. To identify the effect of changing a value
4. To explain that each sprite has its own instructions
5. To design the parts of a project
6. To use my algorithm to create a program

Year 2 Computing Progression in Skills and Knowledge

NC Knowledge and Computational Skills

Autumn 1 Computing systems and networks Information technology around us (2.1)*****

- Identifying IT and how it's responsible use improves our world in school and beyond

National curriculum links

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content
- Recognise common uses of information technology beyond school
- Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Education for a Connected World links

Health, well-being and lifestyle

- I can identify rules that help keep us safe and healthy in and beyond the home when using technology.
- I can give some simple examples.

Unit objectives:

1. To recognise the uses and features of information technology
2. To identify information technology in the home
3. To identify information technology beyond school
4. To explain how information technology benefits us
5. To show how to use information technology safely
6. To recognise that choices are made when using information technology

Autumn 2 Creating media A Digital photography (2.2)

- Capturing and changing digital photographs for different purposes

National curriculum computing links

Computing

- Use technology purposefully to create, organise, store, manipulate, and retrieve digital content
- Recognise common uses of information technology beyond school
- Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

Further national curriculum links

Art and design

- To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form, and space

Education for a Connected World links

- To identify that some images are not real (fake)

Unit objectives:

1. To use a digital device to take a photograph
2. To make choices when taking a photograph

3. To describe what makes a good photograph
4. To decide how photographs can be improved
5. To use tools to change an image
6. To recognise that photos can be changed

Spring 1 Programming A Robot algorithms (2.3)

- Creating and debugging programs and using logical reasoning to make predictions

National curriculum links

- Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- Create and debug simple programs
- Use logical reasoning to predict the behaviour of simple programs
- Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Unit objectives:

1. To describe a series of instructions as a sequence
2. To explain what happens when we change the order of instructions
3. To use logical reasoning to predict the outcome of a program (series of commands)
4. To explain that programming projects can have code and artwork
5. To design an algorithm
6. To create and debug a program that I have written

Spring 2 Data and information Pictograms (2.4)

- Collecting data in tally charts and using attributes to organise and present data on a computer

National curriculum links

Computing

- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

Maths

Building on Year 1 number and place value:

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: 'equal to', 'more than', 'less than' ('fewer'), 'most', 'least'

Year 2:

- interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and comparing categorical data
- Notes and guidance: Pupils record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10).

Education for a Connected World links

Self-image and identity

- I can recognise that I can say 'no'/'please stop'/'I'll tell'/'I'll ask' to somebody who asks me to do something that makes me feel sad, embarrassed or upset
- I can explain how this could be either in real life or online
- If something happens that makes me feel sad, worried, uncomfortable, or frightened I can give examples of when and how to speak to an adult I can trust

Health, wellbeing and lifestyle

- I can identify rules that help keep us safe and healthy in and beyond the home when using technology
- I can give some simple examples

Privacy and security

- I can identify some simple examples of my personal information (e.g. name, address, birthday, age, location)
- I can describe the people I can trust and can share this with; I can explain why I can trust them
- I can recognise more detailed examples of information that is personal to me (e.g. where I live, my family's names, where I go to school)

Unit objectives:

1. To recognise that we can count and compare objects using tally charts
2. To recognise that objects can be represented as pictures
3. To create a pictogram
4. To select objects by attribute and make comparisons
5. To recognise that people can be described by attributes
6. To explain that we can present information using a computer

Summer 1 Creating media B Making music (2.5)

- Using a computer as a tool to explore rhythms and melodies before creating a musical composition

Computing national curriculum links

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content

Music national curriculum links

- Play tuned and untuned instruments musically
- Listen with concentration and understanding to a range of high-quality live and recorded music
- Experiment with, create, select and combine sounds using the inter-related dimensions of music

Education for a Connected World links

Copyright and ownership

- I know that work I create belongs to me.

Unit objectives:

1. To say how music can make us feel
2. To identify that there are patterns in music
3. To describe how music can be used in different ways
4. To show how music is made from a series of notes

5. To create music for a purpose
6. To review and refine our computer work

Summer 2 Programming B Programming quizzes (2.6)

- Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz

National curriculum links

- Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- Create and debug simple programs
- Use logical reasoning to predict the behaviour of simple programs

Unit objectives:

1. To choose a command for a given purpose
2. To show that a series of commands can be joined together
3. To identify the effect of changing a value
4. To explain that each sprite has its own instructions
5. To design the parts of a project
6. To use my algorithm to create a program

Year 3 Computing Progression in Skills and Knowledge

NC Knowledge and Computational Skills
Autumn 1 Computing systems and networks Connecting computers (3.1) - Identifying that digital devices have inputs, and outputs, and how devices can be connected to make networks
National curriculum links **Computing** ● Use sequence, selection, and repetition in programs; work with variables and various forms of input and output ● Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration ● Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information **Maths (lesson 1)** ● **Number and place value:** Solve number problems and practical problems **Art (lesson 3)** ● To improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials **Unit objectives:** 1. To explain how digital devices function 2. To identify input and output devices 3. To recognise how digital devices can change the way we work 4. To explain how a computer network can be used to share information 5. To explore how digital devices can be connected 6. To recognise the physical components of a network
Autumn 2 Creating media A Stop-frame animation (3.2) - Capturing and editing digital still images to produce a stop-frame animation that tells a story
National curriculum computing links **Computing** ● Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information ● use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. **Further national curriculum links** **Literacy links** ● Pupils should be taught to: draft and write by: in narratives, creating settings, characters and plot ● Pupils should be taught to: proof-read for spelling and punctuation errors

History

- The Roman Empire and its impact on Britain

Education for a Connected World links

Managing online information

- I can use key phrases in search engines.
- I can use search technologies effectively.

Copyright and ownership

- I can explain why copying someone else's work from the internet without permission can cause problems.
- I can give examples of what those problems might be.
- When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.
- I can give some simple examples.

Unit objectives:

1. To explain that animation is a sequence of drawings or photographs
2. To relate animated movement with a sequence of images
3. To plan an animation
4. To identify the need to work consistently and carefully
5. To review and improve an animation
6. To evaluate the impact of adding other media to an animation

Spring 1 Programming A Sequencing sounds (3.3)

- Creating sequences in a block-based programming language to make music

National curriculum links

- Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Unit objectives:

1. To explore a new programming environment
2. To identify that commands have an outcome
3. To explain that a program has a start
4. To recognise that a sequence of commands can have an order
5. To change the appearance of my project
6. To create a project from a task description

Spring 2 Data and information Branching databases (3.4)

- Building and using branching databases to group objects using yes/no questions

National curriculum links

- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information
- Use technology safely, respectfully, and responsibly

Unit objectives:

1. To create questions with yes/no answers
2. To identify the object attributes needed to collect relevant data
3. To create a branching database
4. To explain why it is helpful for a database to be well structured
5. To identify objects using a branching database
6. To compare the information shown in a pictogram with a branching database

Summer 1 Creating media B Desktop publishing (3.5)

- Creating documents by modifying text, images and page layouts for a specified purpose

National curriculum links

Computing

- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information

English programmes of study links

- Pupils should be taught to draft and write by: in non-narrative material, using simple organisational devices [for example, headings and subheadings]
- Evaluate and edit by assessing the effectiveness of their own and others' writing and suggesting improvements
- Proofread for spelling and punctuation errors

Education for a Connected World links

- Managing online information
- I can use key phrases in search engines
- I can use search technologies effectively

Copyright and ownership

- When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it
- I can demonstrate the use of search tools to find and access online content which can be reused by others

Unit objectives:

1. To recognise how text and images convey information
2. To recognise that text and layout can be edited
3. To choose appropriate page settings
4. To add content to a desktop publishing publication
5. To consider how different layouts can suit different purposes
6. To consider the benefits of desktop publishing

Summer 2 Programming B Events and actions in programs (3.6)

- Writing algorithms and programs that use arrange of events to trigger sequences of actions

National curriculum links

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Unit objectives:

1. To explain how a sprite moves in an existing project
2. To create a program to move a sprite in four directions
3. To adapt a program to a new context
4. To develop my program by adding features
5. To identify and fix bugs in a program
6. To design and create a maze-based challenge

Year 4 Computing Progression in Skills and Knowledge

NC Knowledge and Computational Skills

Autumn 1 Computing systems and networks The internet (4.1)

- Recognising the internet as a network of networks including WWW and why we should evaluate online content

National curriculum links

Computing

- Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

PSHE (Lesson 6)

- Evaluating content for honesty and accuracy

Art (Lesson 3)

- To improve their mastery of art and design techniques, including drawing, painting, and sculpture with a range of materials

Unit objectives:

1. To describe how networks physically connect to other networks
2. To recognise how networked devices make up the internet
3. To outline how websites can be shared via the World Wide Web
4. To describe how content can be added and accessed on the World Wide Web
5. To recognise how the content of the WWW is created by people
6. To evaluate the consequences of unreliable content

Autumn 2 Creating media A Audio editing (4.2)

- Capturing and editing audio to produce a podcast, ensuring that copyright is considered

National curriculum links

Computing – KS2

- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information
- Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Science – Year 4 (Lesson 2)

- **Sound:** Find patterns between the volume of a sound and the strength of the vibrations that produced it
- **Sound:** Recognise that sounds get fainter as the distance from the sound source increases

English – Years 3 and 4 (Lesson 3)

- **Writing – composition:** Plan their writing by discussing and recording ideas
- **Writing – draft and write by:** In non-narrative material, using simple organisational devices [for example, headings and subheadings]
- **Writing:** Read aloud their own writing, to a group or the whole class, using appropriate intonation and controlling the tone and volume so that the meaning is clear

Music – KS2 (Lesson 5)

- Improvise and compose music for a range of purposes using the interrelated dimensions of music

Education for a Connected World links

Copyright and ownership

- I can explain why copying someone else's work from the internet without permission can cause problems (Y3)
- I can give examples of what those problems might be (Y3)
- When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it (Y4)
- I can give some simple examples (Y4)

Unit objectives:

1. To identify that sound can be digitally recorded
2. To use a digital device to record sound
3. To explain that a digital recording is stored as a file
4. To explain that audio can be changed through editing
5. To show that different types of audio can be combined and played together
6. To evaluate editing choices made

Spring 1 Programming A Repetition in shapes (4.3)

- Using a text-based programming language to explore count-controlled loops when drawing shapes

- **National curriculum links**
- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Unit objectives:

1. To identify that accuracy in programming is important
2. To create a program in a text-based language
3. To explain what 'repeat' means
4. To modify a count-controlled loop to produce a given outcome
5. To decompose a task into small steps
6. To create a program that uses count-controlled loops to produce a given outcome

Spring 2 Data and information Data logging (4.4)

- Recognising how and why data is collected over time before using data loggers to carry out an investigation

National curriculum links

Computing – Key stage 2

- ...work with various forms of input
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Science – Lower key stage 2/Year 4

- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.

Unit objectives:

1. To explain that data gathered over time can be used to answer questions
2. To use a digital device to collect data automatically
3. To explain that a data logger collects 'data points' from sensors over time
4. To use data collected over a long duration to find information
5. To identify the data needed to answer questions
6. To use collected data to answer questions

Summer 1 Creating media B Photo editing (4.5)

- Manipulating digital images and reflecting on the impact of changes and whether the required process is fulfilled

Computing national curriculum links

- Use search technologies effectively
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Education for a Connected World links

Self-image and identity

- I can describe ways in which people might make themselves look different online.

Copyright and ownership

- When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.

Unit objectives:

1. To explain that digital images can be changed
2. To change the composition of an image
3. To describe how images can be changed for different uses
4. To make good choices when selecting different tools
5. To recognise that not all images are real
6. To evaluate how changes can improve an image

Summer 2 Programming B Repetition in games (4.6)

- Using a block-based programming language to explore count-controlled and infinite loops when creating a game

National curriculum links

- Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Unit objectives:

1. To develop the use of count-controlled loops in a different programming environment
2. To explain that in programming there are infinite loops and count-controlled loops
3. To develop a design that includes two or more loops which run at the same time
4. To modify an infinite loop in a given program
5. To design a project that includes repetition
6. To create a project that includes repetition

Year 5 Computing Progression in Skills and Knowledge

NC Knowledge and Computational Skills
Autumn 1 Computing systems and networks Sharing information (5.1) - Identifying and exploring how information is shared between digital systems
National curriculum links • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact Education for a Connected World links • I can assess and justify when it is acceptable to use the work of others • I can give examples of content that is permitted to be reused **Unit objectives:** 1. To explain that computers can be connected together to form systems 2. To recognise the role of computer systems in our lives 3. To recognise how information is transferred over the internet 4. To explain how sharing information online lets people in different places work together 5. To contribute to a shared project online 6. To evaluate different ways of working together online
Autumn 2 Creating media A Video editing (5.2) - Planning, capturing and editing video to produce a short film
Computing • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. **Internet safety** • Recognise inappropriate content, contact, and conduct and know how to report concerns • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour • Identify a range of ways to report concerns about content and contact Education for a Connected World links (Years 7–11)

Self-image and Identity

- I can explain how I can represent myself in different ways online
- Knowing this, I can describe the right decisions about how I interact with others and how others perceive me

Online relationships

- I can recognise some ways in which the internet can be used to communicate
- I can give examples of how to be respectful to others online

Online reputation

- I can search for information about an individual online and create a summary report of the information I find
- I can explain ways that some of the information about me online could have been created, copied, or shared by others

Managing online information

- I can evaluate digital content (and can explain how I make choices from search results)

Unit objectives:

1. To recognise video as moving pictures, which can include audio
2. To identify digital devices that can record video
3. To capture video using a digital device
4. To recognise the features of an effective video
5. To identify that video can be improved through reshooting and editing
6. To consider the impact of the choices made when making and sharing a video

Spring 1 Programming A Selection in physical computing (5.3)

- exploring conditions and selection using programmable microcontroller

Computing

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Science – Electricity (Year 4)

- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

Unit objectives:

1. To control a simple circuit connected to a computer
2. To write a program that includes count-controlled loops
3. To explain that a loop can stop when a condition is met, eg number of times
4. To conclude that a loop can be used to repeatedly check whether a condition has been met
5. To design a physical project that includes selection
6. To create a controllable system that includes selection

Spring 2 Data and information Flat-file databases (5.4)

- Using a database to order and create charts to answer questions

National curriculum links

- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information

Unit objectives:

1. To use a form to record information.
2. To compare paper and computer-based databases.
3. To outline how grouping and then sorting data allows us to answer questions.
4. To explain that tools can be used to select specific data.
5. To explain that computer programs can be used to compare data visually.
6. To apply my knowledge of a database to ask and answer real-world questions.

Summer 1 Creating media B Vector drawing (5.5)

- Creating images in a drawing program by using layers and groups of objects

National curriculum links

- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information.

Education for a Connected World links

Copyright and ownership

- I can explain why copying someone else's work from the internet without permission can cause problems.

Unit objectives:

1. To identify that drawing tools can be used to produce different outcomes.
2. To create a vector drawing combining shapes.
3. To use tools to achieve a desired effect.
4. To recognise that vector drawings consist of layers.
5. To group objects to make them easier to work with.
6. To evaluate my vector drawing.

Summer 2 Programming B Selection in quizzes (5.6)

- Exploring selection in programming to design and code an interactive quiz

Computing

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

Unit objectives:

1. To explain how selection is used in computer programs.

2. To relate that a conditional statement connects a condition to an outcome.
3. To explain how selection directs the flow of a program.
4. To design a program which uses selection.
5. To create a program which uses selection.
6. To evaluate my program

Year 6 Computing Progression in Skills and Knowledge

NC Knowledge and Computational Skills

Autumn 1 Computing systems and networks

Internet communication (6.1)

- Recognising how the WWW can be used t communicate and be searched to find information

National curriculum links

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration
- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Education for a Connected World links

- I can describe and assess the benefits and the potential risks of sharing information online.
- I can use various additional tools to refine my searches (e.g. search filters: size, type, usage rights etc.).
- I can explain how to use search effectively and use examples from my own practice to illustrate this.
- I can explain how search engine rankings are returned and can explain how they can be influenced (e.g. commerce, sponsored results).

Unit objectives:

1. To identify how to use a search engine.
2. To describe how search engines select results.
3. To explain how search results are ranked.
4. To recognise why the order of results is important and to whom.
5. To recognise how we communicate using technology.
6. To evaluate different methods of online communication

Autumn 2 Creating media A Webpage creation (6.2)

- Designing and creating webpages, giving consideration to copyright, aesthetics and navigation

National curriculum links

- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information.
- use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour.

English links

- Writing composition: Identifying the audience for and purpose of the writing, selecting the appropriate form, and using other similar writing as models for their own.

Education for a Connected World links

Online relationships

- I can use the internet with adult support to communicate with people I know. (EY-7)

Managing information online

- I can navigate online content, websites, or social media feeds using more sophisticated tools to get to the information I want (e.g. menus, sitemaps, breadcrumb-trails, site search functions). (11-14)

Copyright and ownership

- I can explain why copying someone else's work from the internet without permission can cause problems.
- I can give examples of what those problems might be.
- When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.
- I can give some simple examples.
- I can assess and justify when it is acceptable to use the work of others.
- I can give examples of content that is permitted to be reused.
- I can demonstrate the use of search tools to find and access online content which can be reused by others.
- I can demonstrate how to make references to and acknowledge sources I have used from the internet.
- I can explain the principles of fair use and apply this to case studies. (11-14)

Unit objectives:

1. To review an exiting website and consider its structure.
2. To plan the features of a web page.
3. To consider the ownership and use of images (copyright).
4. To recognise the need to preview pages.
5. To outline the need for a navigation path.
6. To recognise the implications of linking the content owned by other people.

Spring 1 Programming A Variables in games (6.3)

- exploring variables when designing and coding a game

National curriculum links

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Unit objectives:

1. To define a 'variable' as something that is changeable.

2. To explain why a variable is used in a program.
3. To choose how to improve a game by using variables.
4. To design a project that builds on a given example.
5. To use my design to create a project.
6. To evaluate my project.

Spring 2 Data and information Introduction to spreadsheets (6.4)

- Answering questions by using spreadsheets to organise and calculate data

National curriculum links

- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information

National curriculum maths links

Number – addition, subtraction, multiplication, and division:

- Solve problems involving addition, subtraction, multiplication, and division

Statistics:

- Interpret and construct pie charts and line graphs, and use these to solve problems
- Calculate and interpret the mean as an average

Education for a Connected World links

Managing information online

- I can describe how I can search for information within a wide group of technologies (e.g. social media, image sites, video sites)
- I can use different search technologies
- I can evaluate digital content and can explain how I make choices from search results

Unit objectives:

1. To identify questions which can be answered using data.
2. To explain that objects can be described using data.
3. To explain that formula can be used to produce calculated data.
4. To apply formulas to data, including duplicating.
5. To create a spreadsheet to plan an event.
6. To choose suitable ways to present data.

Summer 1 Creating media B 3D modelling (6.5)

- Planning, developing and evaluating 3D models of physical objects

National curriculum links

Computing – KS2

- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Art and design – KS2

- To improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials

Design and technology – KS2

- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Mathematics – KS2 (Y6)

- Recognise, describe and build simple 3D shapes, including making nets

Education for a Connected World links

Strand

- Lesson 1 and Lesson 3 – Privacy and Security (Y4) – I can describe strategies for keeping my personal information private, depending on context

Unit objectives:

1. To use a computer to create and manipulate three-dimensional (3D) digital objects.
2. To compare working digitally with 2D and 3D graphics.
3. To construct a digital 3D model of a physical object.
4. To identify that physical objects can be broken down into a collection of 3D shapes.
5. To design a digital model by combining 3D objects.
6. To develop and improve a digital 3D model.

Summer 2 Programming B Sensing (6.6)

- Designing and coding a project that captures inputs from a physical device

National curriculum links

- Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Unit objectives:

1. To create a program to run a controllable device.
2. To explain that selection can control the flow of a program.
3. To update a variable with a user input.
4. To use a conditional statement to compare a variable to a value.
5. To design a project that uses inputs and outputs on a controllable device.
6. To develop a program to use inputs and outputs on a controllable device.