Computing Progression Map
Cycle B

"A computer is not a device anymore. It is an extension of your mind and your gateway to other people"

Mark Shuttleworth

Computing Curriculum Map
Cycle B

Programming

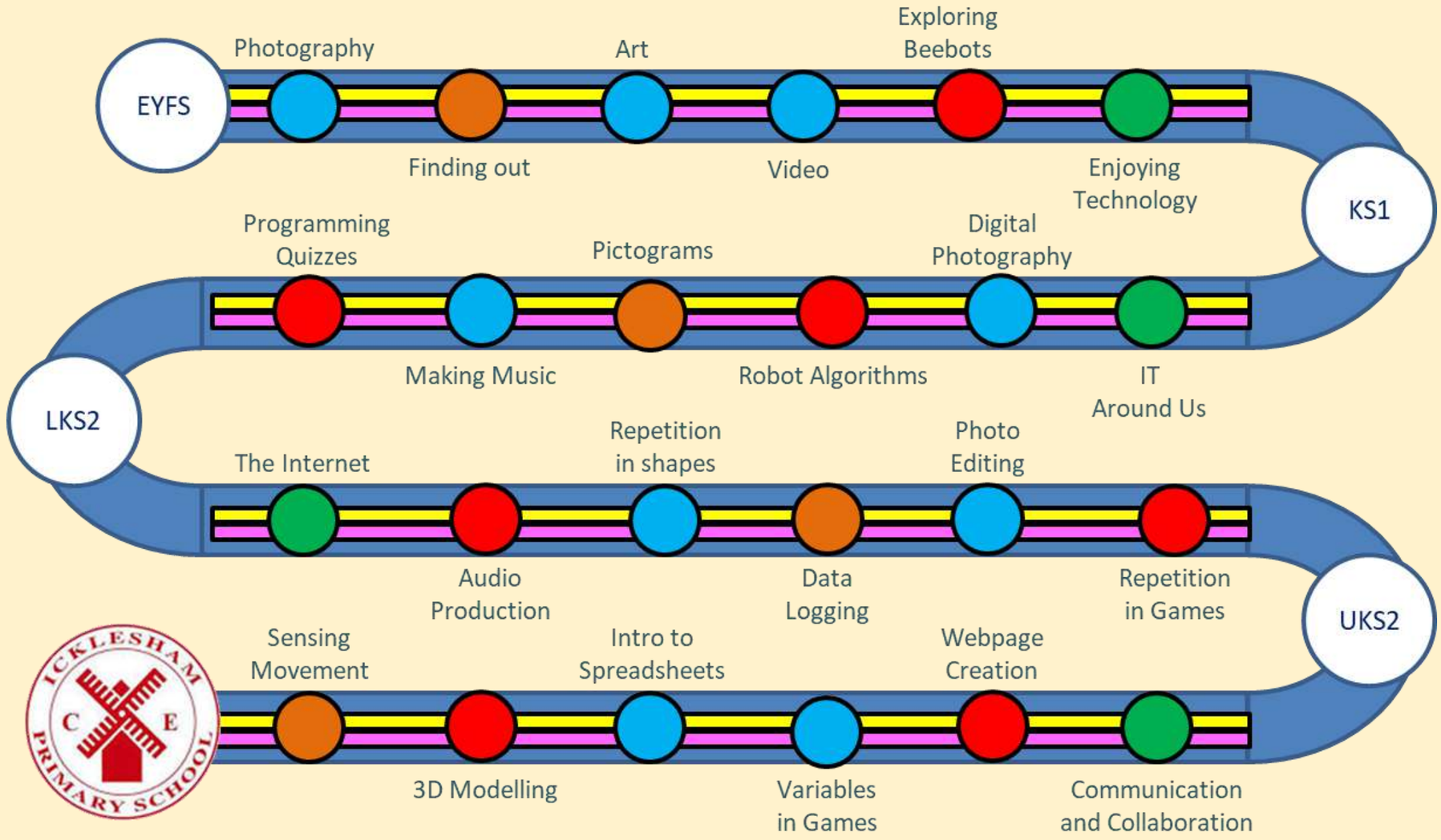
Data and Information

Computer Systems and Networks

Creating Media

Digital Literacy

Online Safety



Cycle B –EYFS – Understanding the World - Online Safety

Objective
To know what online safety means

I wonder...
How can we use the internet safely?

Substantive Knowledge (Content)

- To know what to say if you don't like something
- To know how the internet can be used
- To be able to communicate using the internet via email/ messaging / visdo call
- To know that we should be nice using the internet
- To know that the internet can help us learn
- To know what rules we need to keep safe
- To know that personal information includes details such as our full name, address and school

Future Learning

KS1
Children will learn why having rules for using the internet is important.

LKS2
Children will be learning what information can be found about people online.

UKS2
Children will be learning about what their responsibilities are when they are online.

Skills

Communicating	Talking with someone about something including things we like and don't like
Following rules	Listening to what can and can't be done
Using hardware and software	Using technology, e.g., ipads and apps for a purpose

Concepts

Online safety	Keeping ourselves and others safe when using the internet
Communication	Sharing meaning and information through words, images or actions
Consent	Permission or agreement
Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Cause and consequence	Things that happen can impact things that happen later on

Key vocabulary

Internet	Connecting millions of computers worldwide
online	Controlled by or connected to a computer
rules	How we should behave
safe	Protect you from harm
personal information	Information used to identify you.
private information	
communicate	

Assessment points

- **Communicate** what they like and don't like
- **Understand** what private means
- **Explain** how the internet can be used
- **Understand** why we should be nice to others
- **Identify** some rules for using the internet
- **Explain** what personal information is

EYFS Coverage

- Computing is not a discrete area in the EYFS but it underpins all other areas. This unit will enable learning in all other curriculum areas as children record their learning in order to reflect upon and evaluate it.

Minimum expectations, including pupils wit SEND
Children know what to do if they see something they don't like. With support, children can remember some of the rules for keeping safe online.

High prior attainment and extension opportunities, including pupils with SEND
Children to navigate through a specific webpage to explore what they like and don't like.

Cycle B – Computing – KS1 – Online Safety

Objective
To keep personal information private when using the internet

I wonder...
How can we keep things safe online?

Substantive Knowledge (Content)

- To know that online safety means things we can do so that we are safe online
- To know that some things online can to be true or false
- To know some people may act in hurtful and unkind ways online
- To be able to say what difference between personal and private information is
- To be able to keep information private through strong passwords
- To know that to protect a device you should use a password and log out when you have finished using it

Prior Learning

EYFS
Children have learnt what to do if they don't like something and how to use the internet.

Future Learning

LKS2
Children will be learning what information can be found about people online.

UKS2
Children will be learning about what their responsibilities are when they are online.

Skills

Communicating	Talking with someone about something including things we like and don't like
Following rules	Listening to what can and can't be done
Using hardware and software	Using technology, e.g., ipads and apps for a purpose

Concepts

Online safety	Keeping ourselves and others safe when using the internet
Communication	Sharing meaning and information through words, images or actions
Consent	Permission or agreement
Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Cause and consequence	Things that happen can impact things that happen later on

Key vocabulary

cyber bullying	Using bullying behaviour online
password	A code that helps keep things protected
protect	Keeping something safe
internet	Connecting millions of computers worldwide
communicate	Share or exchange information
keywords	
imaginary	
devices	
copyright	
fair use	

Assessment points

- **Explain** what online safety means
- **Identify** some types of private information
- **Explain** why some information is private
- **Understand** how to keep information private online
- **Understand** how people may act differently online
- **Recognise** that not everything online is true
- **Understand** what a password is used for

National Curriculum Coverage

- 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.

Minimum expectations, including pupils with SEND
Children to identify some types of information that are private. With support, children can explain how to keep information private.

High prior attainment and extension opportunities, including pupils with SEND
Children to think about, discuss and reason why some people may act differently online.

Cycle B – Computing – LKS2 – Online Safety

Objective
How to keep safe online

I wonder...
What information can I find about me on online?

Substantive Knowledge (Content)

- To know that online identity is the way others see you online
- To understand that online and offline identities can be different
- To know that information about me can be found online through search engines or our online identity
- To know that some strategies for staying safe online include the use of passwords, online names and reporting behaviour / comments you don't like
- To know that online bullying can occur anytime you are connected to other people online
- To know that Artificial Intelligence is the science of making machines that can think like humans.
- To know that the dangers of app purchases are that you give the app your bank details and personal information and could be open to fraud
- To that strong passwords are important because they are more difficult for people to hack
- To know that screen addiction is when you can't stop playing a game / using an app

Prior Learning

EYFS
Children have learnt what to do if they don't like something and how to use the internet.

KS1
Children have learnt how to keep things safe online.

Future Learning

UKS2
Children will be learning about what their responsibilities are when they are online.

KS3
Children will be learning about online safety including, malware, phishing, cyberbullying, trolling and using firewalls and antivirus software to protect from viruses.

Skills

Communicating	Talking with someone about something including things we like and don't like
Following rules	Listening to what can and can't be done
Using hardware and software	Using technology, e.g., ipads and apps for a purpose

Concepts

Online safety	Keeping ourselves and others safe when using the internet
Communication	Sharing meaning and information through words, images or actions
Consent	Permission or agreement
Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Cause and consequence	Things that happen can impact things that happen later on

Key vocabulary

identity	Who somebody is
online	Connected to a computer
offline	Not connected to a computer
Artificial Intelligence	The ability for a computer to think and learn
App purchases	Buying things through an app
keywords	
imaginary	
devices	
copyright	
fair use	
cyber bullying	
password	
protect	
internet	
communicate	
screen addiction	

Assessment points

- **Explain** what online identity means
- **Understand** the difference between online and offline identities
- **Identify** strategies for staying safe online
- **Explain** the dangers of app purchases are
- **Understand** what Artificial Intelligence is
- **Recognise** why strong passwords are important
- **Understand** what screen addiction is

National Curriculum Coverage

- 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.

Minimum expectations, including pupils with SEND
Children to identify some strategies for staying safe online. With support, children can explain what an online identity is.

High prior attainment and extension opportunities, including pupils with SEND
Children to think about, discuss and reason why some people may act differently online.

Cycle B – Computing – UKS2 – Online Safety

Objective
How to keep safe online

I wonder...
What are my responsibilities when I'm online?

Substantive Knowledge (Content)

- To know that inappropriate representations are how someone / something is presented but it is not suitable for the purpose
- To know that my responsibilities online include being respectful to others and reporting abuse
- To be able to build a positive reputation
- To be able to self-regulate use of technology
- To know that impulsive communications are when someone communicates without thinking usually at an inappropriate way / time
- To know that impulsive communications can cause problems with others as they may be hurtful or illegal
- To be able to an apps use privacy settings

Prior Learning

EYFS
Children have learnt what to do if they don't like something and how to use the internet.

KS1
Children have learnt how to keep things safe online.

LKS2
Children have learnt what information can be found about people online.

Future Learning

KS3
Children will be learning about online safety including, malware, phishing, cyberbullying, trolling and using firewalls and antivirus software to protect from viruses.

Skills

Communicating	Talking with someone about something including things we like and don't like
Following rules	Listening to what can and can't be done
Using hardware and software	Using technology, e.g., ipads and apps for a purpose

Concepts

Online safety	Keeping ourselves and others safe when using the internet
Communication	Sharing meaning and information through words, images or actions
Consent	Permission or agreement
Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Cause and consequence	Things that happen can impact things that happen later on

Key vocabulary

inappropriate	Not right or suited for some purpose or situation
representation	How something is presented or seen
reputation	The general belief or opinion that other people have about you
impulsive	Acting without thinking or planning
privacy	Keeping things private
keywords	
imaginary	
devices	
copyright	
fair use	
cyber bullying	
password	
protect	
internet	
communicate	
technology	
positive	

Assessment points

- **Explain** what inappropriate representations are
- **Identify** some responsibilities I have when online
- **Explain** how to build a positive reputation
- **Understand** how to self-regulate my use of technology
- **Recognise** what impulsive communications are
- **Understand** how impulsive communication can cause problems
- **Understand** how apps use privacy

National Curriculum Coverage

- 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.

Minimum expectations, including pupils with SEND
Children to identify some responsibilities they have when being online. With support, children can explain what impulsive communications are.

High prior attainment and extension opportunities, including pupils with SEND
Children to think about, discuss and reason where and when impulsive communications are likely to happen.

Cycle B –EYFS –Understanding the World - Unit 1: Photography

Objective
To use photography apps to support learning.

I wonder...
How can we make sure we remember how great this work is after we have tidied it away?

Substantive Knowledge (Content)

- To know we can record our learning using photography apps on the iPad.
- To know we need to ensure that the subject of our photo is in focus
- To be able to use photography to create art
- To be able to use different photography apps do different things
- To be able to use apps on the iPad to manipulate photos we have taken.
- To know we must always obtain consent before taking a photo of someone or their work

Future Learning

KS1
Children will be learning more about digital photography.

LKS2
Children will be learning about photo editing.

UKS2
Children will be learning about 3D modelling.

Skills

Using hardware and software	Using technology, e.g., ipads and apps for a purpose
Creating media	design and development, respectful and responsible communication, presenting, creating content

Concepts

technology	Something that is designed to help with a task.
App (abb. Application)	Computer program designed for specific purposes
digital	Using or relating to digital signals or technology
focus	Clarity, not blurry
consent	Permission or agreement

Key vocabulary

tablet	Small, flat computer, controlled by touching the screen
iPad	Tablet brand name
camera	Device for taking photographs
photograph	Picture produced using a camera
record	To keep information for the future
app	Computer program designed for specific purposes
focus	Clarity, not blurry
consent	Permission or agreement
delete	To remove data, documents etc from a computer

Assessment points

- **Use** photography apps to record learning
- **Create** photos that are in focus
- **Use** photography apps to create art
- **Use** a range of photography apps for different effects
- **Create** art by manipulating photos we have taken
- **Understand** what is meant by consent and that it is essential

EYFS Coverage

- Computing is not a discrete area in the EYFS but it underpins all other areas. This unit will enable learning in all other curriculum areas as children record their learning in order to reflect upon and evaluate it.

Minimum expectations, including pupils with SEND
With adult help

- **Use** photography apps to record learning
- **Use** photography apps to create art
- **Understand** what is meant by consent and that it is essential

High prior attainment and extension opportunities, including pupils with SEND
Children to share their developing skills with others, supporting their friends to learn how to use apps that they are already confident with.

Cycle B –EYFS – Understanding the World - Unit 2: Finding out

Objective
To use the internet to support our learning

I wonder...
What questions do you have about that? How could we find out the answers?

Substantive Knowledge (Content)

- To know we can use search engines on the internet to find information – answers to questions, images and videos that will help us with our learning.
- To know that Google is a search engine
- To know we can type questions or key words into the search box to find information or images
- To know that some computers will allow us to use our voice to search instead of typing
- To be able to decide that some information we find will be more useful than others

Future Learning

KS1
Children will continue to use search engines to find information in the context of their learning.

LKS2
Children will be learning about networks including the Internet.

UKS2
Children will be learning about communication and collaboration between networks.

Skills

Using hardware and software	Using technology, e.g., ipads and apps for a purpose
Using computing systems and networks	Using e.g., the internet
Using data and information	collecting, analysing, evaluating, presenting data and information

Concepts

technology	Something that is designed to help with a task.
internet	The large system of connected computers around the world that enables people to share information and communicate with one another

Key vocabulary

question	A sentence or phrase used to find out information
computer	An electronic device for working with information
screen	The flat surface of the computer on which pictures and words are shown
Search engine	A computer program that finds information on the internet by looking for words that you have typed in
Search box	A space on a computer screen where you type a word or phrase relating to information you want to find
click	Push the yellow mouse button
cursor	An arrow on the computer screen to show where you are working.
mouse	Controls the cursor on the screen
keyboard	Input device with a set of keys which allow you to type letters and numbers.
type	To write using a computer keyboard
microphone	A piece of equipment that you speak into to record your voice
information	Facts about a situation, person, event etc.
image	A picture

Assessment points

- **Use** search engines, primarily Google, to find information and images.
- **Use** a computer keyboard to type words / phrases into search engine
- **Use** microphone to dictate words / phrases into search engines
- **Collect** information
- **Evaluate** whether or not the information we have collected answers our question.
- **Understand** that some information we find might not be useful

EYFS Coverage

- Computing is not a discrete area in the EYFS but it underpins all other areas. This unit will enable learning in all other curriculum areas as children find information to enhance their learning and develop their interests.

Minimum expectations, including pupils with SEND
With adult support

- **Use** search engines, primarily Google, to find information and images.
- **Use** a computer keyboard to type words / phrases into search engine
- **Use** microphone to dictate words / phrases into search engines
- **Collect** information

High prior attainment and extension opportunities, including pupils with SEND
Children will use the computer independently to find information they need for their child-initiated projects and interests.

Cycle B –EYFS –Understanding the World - Unit 3: Art

Objective
To use a range of apps to create art

I wonder...
What different tools and resources can people use to create works of art?

Substantive Knowledge (Content)

- To know we can use apps to create art.
- To know we can use apps to create art on a small scale (e.g., on an iPad) or a large scale (e.g., on an interactive whiteboard)
- To know that different apps offer different possibilities
- To be able to use different tools within apps produce different effects.

Future Learning

KS1
Children will develop their skills in digital painting.

LKS2
Children will be learning about desktop publishing.

UKS2
Children will be learning about 3D modelling.

Skills

Using hardware and software	Using technology, e.g., ipads and apps for a purpose
Creating media	design and development, respectful and responsible communication, presenting, creating content

Concepts

technology	Something that is designed to help with a task.
App (abb. Application)	Computer program designed for specific purposes
digital	Using or relating to digital signals or technology

Key vocabulary

tablet	Small, flat computer, controlled by touching the screen
iPad	Tablet brand name
App	Computer program designed for specific purposes
click	Push the yellow mouse button
cursor	An arrow on the computer screen to show where you are working.
mouse	Controls the cursor on the screen
tool	A feature of a program that helps you do particular things
drag	To move something on a computer screen
select	To choose something from a computer menu
undo	To go back a step and reverse an action
erase	To rub out a mistake

Assessment points

- **Use** tools in apps to create different effects
- **Create** art on a small scale using an iPad.
- **Create** art on a large scale using the interactive whiteboard.

EYFS Coverage

- Computing is not a discrete area in the EYFS but it underpins all other areas. This unit will enable learning in Expressive Arts and Design:
- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. *Creating with Materials ELG*
- Share their creations, explaining the processes they have used. *Creating with Materials ELG*

Minimum expectations, including for pupils with SEND
With adult support

- **Use** tools in apps to create different effects
- **Create** art on a small scale using an iPad.
- **Create** art on a large scale using the interactive whiteboard.

High prior attainment and extension opportunities, including for pupils with SEND
Remind children of apps we have used to create art for them to independently select and use an app for their own child-initiated art projects.

Cycle B –EYFS –Understanding the World - Unit 4: Video

Objective
To use video apps to support learning.

I wonder...
How can we show this dance / helicopter story / PE skill to our grown-ups?

Substantive Knowledge (Content)

- To know we can film our play and learning using video apps on the iPad.
- To know we can use apps to combine videos and images and sound to create new videos
- To be able to upload videos to other platforms to share or keep
- To know that when videos have been uploaded, we should delete them from the iPad so it does not get full up
- To be able to create time lapse videos to record changes that take place slowly over time (e.g., butterfly emerging from chrysalis)
- To be able to create slow motion videos
- To be able to speed up videos (e.g., to show a lengthy process more quickly)
- To know we must always obtain consent before taking a video of someone or their work

Future Learning

KS1
Children will be learning about digital sound through music.

LKS2
Children will be learning about stop-frame animation.

UKS2
Children will be learning about video production.

Skills

Using hardware and software	Using technology, e.g., ipads and apps for a purpose
Creating media	design and development, respectful and responsible communication, presenting, creating content

Concepts

technology	Something that is designed to help with a task.
App (abb. Application)	Computer program designed for specific purposes
digital	Using or relating to digital signals or technology
consent	Permission or agreement

Key vocabulary

tablet	Small, flat computer, controlled by touching the screen
iPad	Tablet brand name
App	Computer program designed for specific purposes
film	To record moving pictures with a camera / other technology
Video	A recording of moving pictures and sound
Record	To store moving pictures using electronic equipment so they can be seen later
Play	To cause a machine to produce a video
pause	To make a recording stop for a short time
edit	To make changes to a video, deciding what will be removed and what will be kept in
upload	To copy or move programs or information to a larger computer system or the Internet
delete	To remove data, documents etc from a computer
consent	Permission or agreement
Time lapse video	Video made from a sequence of frames at set intervals to record changes that take place slowly over time
Slow motion	Video playing at a slower speed than normal
Speed up	Video playing at a faster speed than normal

Assessment points

- **Use** video apps to film learning and play.
- **Create** new videos by combining videos and images and sound, using apps.
- **Use** Tapestry to upload and share videos
- **Create** time lapse videos
- **Create** slow motion videos
- **Create** sped-up videos
- **Understand** what is meant by consent and that it is essential

EYFS Coverage

- Computing is not a discrete area in the EYFS but it underpins all other areas. This unit will enable learning in all other curriculum areas as children film their learning and play in order to reflect upon and evaluate it.

Minimum expectations, including for pupils with SEND
With adult support

- **Use** video apps to film learning and play.
- **Create** time lapse videos
- **Create** slow motion videos
- **Create** sped-up videos
- **Understand** what is meant by consent and that it is essential

High prior attainment and extension opportunities, including for pupils with SEND
Children to share their developing skills with others, supporting their friends to learn how to use apps that they are already confident with. Children to be encouraged and facilitated to independently use video apps to film their child-initiated play and learning projects.

Cycle B –EYFS –Understanding the World - Unit 5: Exploring bee bots

Objective
To explore the functions of a bee bot

I wonder...
I wonder how this works?

Substantive Knowledge (Content)

- To know that a bee bot is a small robot built to introduce students to coding and computational thinking
- To know that the functions of the different buttons allow users to direct it to move forwards and backwards in 15 cm increments, and to turn 90 degrees left and right using the four directional buttons, and has go, pause and delete buttons. It can remember a sequence of up to 40 commands.
- To be able to press the buttons in order for it to move.

Future Learning

KS1
Children will be learning about robot algorithms.

LKS2
Children will be learning about repetition in programming.

UKS2
Children will be using programming to sense movement.

Skills

Using hardware and software	Using technology, e.g., ipads and apps for a purpose
Programming	interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors

Concepts

technology	Something that is designed to help with a task.
logic	The process of working step-by-step to understand a problem and develop a solution
algorithm	A step-by-step procedure for solving a problem
program	A set of instructions for a computer to follow to perform a task

Key vocabulary

bee bot	A robot that looks like a bee
button	A small object that you press to operate a device or a machine
press	To push something firmly
directions	Which way you will go
instructions	A list of commands and directions on how to do something
forwards	Move in the direction you are facing
backwards	The opposite of forwards
left	On or towards the side of your body that is to the west when you are facing north
right	On or towards the side of your body that is to the east when you are facing north
turn	To change direction
clear	Delete any previous data

Assessment points

- **Use** bee bots in play
- **Program** a bee bot, using exploratory techniques to understand functions

EYFS Coverage

- Computing is not a discrete area in the EYFS but it underpins all other areas. This unit will enhance mathematical learning as they use technology to explore positional concepts and vocabulary.

Minimum expectations, including for pupils with SEND
With adult support

- **Use** bee bots in play
- **Program** a bee bot, using exploratory techniques to understand functions

High prior attainment and extension opportunities, including for pupils with SEND
Children will plan and program a sequence of moves to reach an identified destination.

Cycle B –EYFS –Understanding the World - Unit 6: Enjoying technology: playing, watching, listening

Objective
To use technology to support playing and learning

I wonder...
How do we watch films?

Substantive Knowledge (Content)
- To know we can play videos, music and games to support our playing and learning.
- To know we can use a range of technology, machines and apps (e.g., the smartboard, cd players, Spotify, iPad, computers) to support our playing and learning.

Future Learning

KS1
Children will continue to use these technologies for learning and for enjoyment.

LKS2
Children will be using programming to make games.

UKS2
Children will be learning about webpage creation.

Skills

Using hardware and software	Using technology, e.g., ipads and apps for a purpose
Using computing systems and networks	Using e.g., the internet

Concepts

technology	Something that is designed to help with a task.
App (abb. Application)	Computer program designed for specific purposes

Key vocabulary

Video	A recording of moving pictures and sound
Music	A pattern of sounds made by instruments, singing or both, to give pleasure to listeners
Game	An entertaining activity
Play	To cause a machine to produce a video or piece of music / to take part in a game
Pause	To make a recording stop for a short time
Stop	To make a recording finish
Search engine	A computer program that finds information on the internet by looking for words that you have typed in
Search box	A space on a computer screen where you type a word or phrase relating to information you want to find
click	Push the yellow mouse button
cursor	An arrow on the computer screen to show where you are working.
drag	To move something on a computer screen
select	To choose something from a computer menu
screen	The flat surface of the computer on which pictures and words are shown
Full screen	Occupying all the available display surface of a screen

Assessment points
- **Use** the internet to play and watch videos to support our playing and learning
- **Use** the internet to play games to support our playing and learning
- **Use** the internet to play and listen to music to support our playing and learning
- **Use** machines to play and listen to music to support our playing and learning

EYFS Coverage
- Computing is not a discrete area in the EYFS but it underpins all other areas. This unit will enable learning in all other curriculum areas as children play videos, music and games to support their playing and learning.
- This unit will also specifically enhance learning in Expressive Arts and Design:
- Sing a range of well-known nursery rhymes and songs. *Being imaginative and Expressive ELG*
- Perform songs, rhymes… with others and – when appropriate – try to move in time with music. *Being imaginative and Expressive ELG*

Minimum expectations, including for pupils with SEND
With adult support
Children can use the internet to play and watch videos to support our playing and learning. With support, children can navigate through a webpage to that allows choice of activity.

High prior attainment and extension opportunities, including for pupils with SEND
Use technologies independently to play videos, music and games to support their playing and learning.

Cycle B – Computing – KS1 – Unit 1: IT Around Us

Objective
To Understand the importance of Information technology

I wonder...
How do computers and information technology help us with our food shopping?

Substantive Knowledge (Content)

- To be able to recognise the features of information technology
- To be able to identify technology in the home
- To be able to identify information technology beyond school
- To be able to explain how information technology benefits us
- To be able to show how to use information technology safely
- To be able to recognise choices are made when using information technology

Prior Learning

EYFS
Children have had access to various types of technology including iPads, bee bots, interactive whiteboards and touch screen computers.

Future Learning

LKS2
Children will be learning about networks including the Internet.

UKS2
Children will be learning about communication and collaboration between networks.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

technology	Anything that helps us
computer	A machine that helps us with processes
barcode	Shown on packaging and can be read by a scanner
scanner	A device used to read barcodes
scan	Sends data to a computer
Information technology	

Assessment points

- **Identify** examples of computers and information technology
- **Describe** some uses of information technology
- **Explain** the purpose of Information technology in the home
- **Compare** types of information technology
- **Explain** how information technology can help people
- **Discuss** the uses of information technology
- **Demonstrate** how information technology helps us to complete various tasks.
- **Recognise** how to use information technology responsibly
- **Identify** the rules/ guidelines to use information technology safely
- **Explain** how information technology is used in different environments and settings (e.g., In school, at the shops, in the home).

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children can physically sort objects that are information technology and those that are not. Identify they types of info technology that they use and how they help them.

High prior attainment and extension opportunities, including for pupils with SEND
Children can explain the used of information technology in a certain environment and think about how this helps people with everyday tasks.

Cycle B – Computing – KS1 – Unit 2: Digital Photography

Objective
To capture and edit photos using a digital device

I wonder...
Can we believe everything we see?

Substantive Knowledge (Content)

- To know that devices such as iPads, mobile phones and digital cameras can be used to take photographs
- To be able to use an iPad to take a photo
- To know that to make a good photo the subject should be interesting and in focus
- To know that a photo can be improved through different apps on devices
- To be able to change an image
- To recognise images can be changed for good and bad reasons

Prior Learning

EYFS
The children have used the iPads to take photos of their learning. They have also explored the use of iPads to make iMovies (supported) and used the cameras to take pictures of their play. They have used the iPads to take photos to create artworks.

Future Learning

LKS2
Children will be learning about photo editing.

UKS2
Children will be learning about 3D modelling.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

device	iPad, phone/ camera
camera	An object that can take photos
capture	Take the picture
editing	Making changes to the photo
filter	Changes the photo before it's taken
background	
digital	
field of view	
flash	
focal point	
horizontal	
image	
landscape	
lighting	
photograph	
portrait	
vertical	

Assessment points

- **Use** an iPad to take a photograph
- **Experiment** taking both landscape and portrait photos
- **Explain** when we would take a portrait in landscape/ portrait
- **Explain** the process of taking a good photo
- **Identify** what is wrong with a photo
- **Describe** how photos can be improved/ retake it
- **Recognise** that images can be changed
- **Use** different tools to achieve a desired effect
- **Experiment** with different light sources
- **Apply** photography skills to capture a photo
- **Explain** my choices
- **Recognise** which images have been changed
- **Classify** images into real images and those that have been changed/edited.

National Curriculum Coverage

- 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

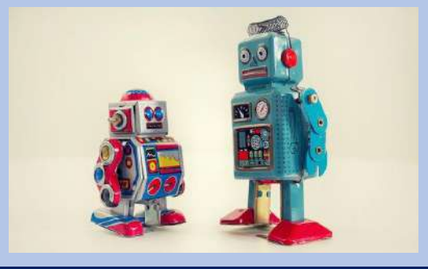
Minimum expectations, including for pupils with SEND
Children will be able to take a photo using an iPad in both portrait and landscape. With support, children will edit the colour of a photo and will be able to identify which photos are real and which photos have been changed.

High prior attainment and extension opportunities, including for pupils with SEND
The children will be able to take some photos independently using the skills they have learnt. They will be able to select the appropriate format and will use and explore the editing tools to improve their photo. Children will explain what they could do to improve their photo.

Cycle B – Computing – KS1 – Unit 3: Robot Algorithms

Objective
To create and debug a program

I wonder...
How do robots know what to do?



Substantive Knowledge (Content)

- To know that a series of instructions can be described as a sequence
- To know that the order of instructions is important
- To be able to predict the outcome of a program
- To be able to create a mat and program for the bee bot
- To be able to design an algorithm (a clear set of instructions to carry out a task)
- To be able to create and debug (correct errors) a program

Prior Learning

EYFS
Children have explored the functions of a bee bot in their play.

Future Learning

LKS2
Children will be learning about repetition in programming.

UKS2
Children will be using programming to sense movement.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

program	Input the instructions
algorithm	A clear set of instructions to carry out a task
order	First, next, then
sequence	The order
debugging	Correct any errors
clear	
command	
instructions	
prediction	
route	

Assessment points

- **Follow** instructions given by someone else
- **Give** clear instructions
- **Explore** changing the order of instructions and explain the differences
- **Predict** the outcome of a sequence
- **Compare** my prediction to the program outcome
- **Identify** different routes the bee bot can take
- **Explain** what the algorithm should achieve

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children will be able to program the bee-bot to move forwards and backwards and to change direction. Children will be provided with arrow cards to help them plan their ideas and debug their program.

High prior attainment and extension opportunities, including for pupils with SEND
Children will create their own maze for the bee-bots and plan a route independently to get them from one side to another. The children will then evaluate and de-bug the program.

Cycle B – Computing – KS1 – Unit 4: Pictograms

Objective
To create a pictogram using a computer and to interpret the information.

I wonder...
How can we use fruit to share information?

Substantive Knowledge (Content)

- To be able to compare and count objects using tally chats
- To be able to enter data (numbers)
- To know that pictograms are a way of presenting data using pictures
- To know that attributes are similar properties of objects
- To be able to create a pictogram
- To be able to present information using a computer

Prior Learning

EYFS
The children have had experience making tally charts and creating simple pictograms during their maths sessions and adult led activities.

Future Learning

LKS2
Children will be learning about data logging.

UKS2
Children will be learning about databases and spreadsheets.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

pictogram	A way of presenting information
data	Number
chart	The way you present the information
attribute	Similar property
total	The entire amount
compare	
count	
least	
less than	
more than	
most	
object	
organise	
tally	

Assessment points

- **Record** data in a tally chart
- **Compare t**otals in a tally
- **Enter** data onto a computer
- **Present** the information using a computer
- **Use** pictograms to answer simple questions about objects
- **Create** a pictogram using a tally and explain the findings
- **Identify** a common attribute (property) to create a tally
- **Compare** data using language more than/ less than/ most/ least
- **Explain** why information should not be shared (e-safety)

National Curriculum Coverage

- 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

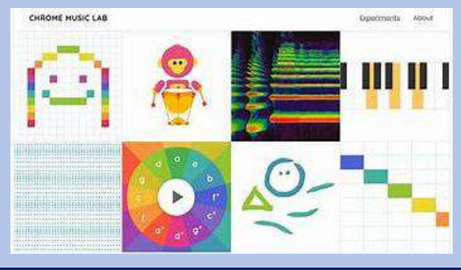
Minimum expectations, including for pupils with SEND
With support, the children will enter given data onto a computer and will interpret the data using the language more than/ less than/ most and least.

High prior attainment and extension opportunities, including for pupils with SEND
Children will collect their own data and can explore the different ways to present their information using block graphs and answer questions related to their findings. The children can further explore the program and see how information can be presented in different ways, (pie chart, line graph etc)

Cycle B – Computing – KS1 – Unit 5: Making Music

Objective
To create music for purpose using a computer

I wonder...
Can a computer play the drums?



Substantive Knowledge (Content)

- To be able to say music makes us feel
- To be able to Identify patterns in music i.e. repetition
- To be able to say how music can be used in different ways i.e. cheer us up, give importance to something, introduce a character
- To know that a series of notes can make music
- To be able to create music for purpose
- To be able to review and refine our computer work

Prior Learning

EYFS
Exploring the sounds that musical instruments make. Experiment with rhythm and beat.

Future Learning

LKS2
Children will be learning about audio production.

UKS2
Children will be learning about web page creation.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

music	Sounds of instrument- a series of notes to create music
instrument	Makes musical sounds
pattern	Repetition
edit	Change
rhythm	Repeated pattern of music
note	
pitch	
pulse	
tempo	

Assessment points

- **Describe** how music makes us feel
- **Identify** patterns in music
- **Discuss** your ideas about what the music may be about.
- **Play** an instrument following a rhythm pattern
- **Experiment** with sound using a computer
- **Use** a computer to create a musical pattern
- **Create** music for purpose
- **Review** and refine our computer work

National Curriculum Coverage

- Use technology purposefully to create, organise, store, manipulate and retrieve digital content
- Recognise common uses of information technology beyond school

Minimum expectations, including for pupils with SEND
Children will be able to explain how different pieces of music make them feel. With support, children will explore the music app and create a musical pattern using a computer.

High prior attainment and extension opportunities, including for pupils with SEND

Children will explore the other features of the program and create their own musical pattern explaining what they like about their (or their friends) music and why they chose particular instruments/rhythms

Cycle B – Computing – KS1 – Unit 6: Programming Quizzes

Objective
To understand about sequencing of commands

I wonder...
Can I create a computer program?

Substantive Knowledge (Content)

- To know that computer programming is writing a group of instructions for a computer to process/carry out
- To know that a sequence is a series of events that must be performed in order to achieve a task
- To be able to predict the likely outcome of a command
- To be able to create a program
- To be able to change a program
  To know that debugging is correcting part of a programme that has an error
- To be able to improve a design

Prior Learning

EYFS
Children have learnt about programming when exploring bee bots.

Future Learning

LKS2
Children will be learning about computer programming through games.

UKS2
Children will be learning about selection in quizzes.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

programming	Inputting the instructions
sequence	The order
command	Instruction to do something
debugging	Correct any errors
outcome	The result of something
coding	
edit	
computer	

Assessment points

- **Describe** what programming is
- **Identify** where a sequence begins
- **Select** elements of coding for editing
- **Use** coding to make a program
- **Compare** the outcome of different commands
- **Explain** what debugging is
- **Demonstrate** how to run and edit a program
- **Evaluate** the effectiveness of the program

National Curriculum Coverage

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

Minimum expectations, including for pupils with SEND
Children will be able to run a program. With support, children can edit part of a program.

High prior attainment and extension opportunities, including for pupils with SEND

Children to think about, discuss and explore what will be the likely outcome of different commands.

Cycle B – Computing – LKS2 – Unit 1: The Internet

Objective
To recognise the internet as a network of networks which need to be kept secure

I wonder...
How does the news get to a phone?

Substantive Knowledge (Content)

- To know that the Internet is a vast network that connects computers all over the world that allows people to share information and communicate from anywhere with an Internet connection
- To know that a network is a group of two or more devices or nodes that can communicate
- To know that networks connect with each other by physical or wireless connections
- To know that devices connect to networks by a wireless signal or an Ethernet cable
- To know websites can be shared on the World Wide Web (WWW) through an HTTP request message to the server
- To know that content (the textual, aural, or visual content published on a website) can be added and accessed on the WWW
- To know that no one person, company, organization or government runs the Internet. It is a globally distributed network comprising many voluntarily interconnected autonomous networks
- To be able to explain why web searches can't always be trusted

Prior Learning
EYFS
Children have used devices to access content on the Internet.
KS1
Children have learnt about different devices that are used in their homes and other places.

Future Learning

UKS2
Children will continue to develop their knowledge and understanding of computing systems and online collaborative working.

KS3
Children will learn about the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

network	Connects two or more computers and communication devices
Internet	A network, or system, that connects millions of computers worldwide
connect	Join together
WWW	World Wide Web
secure	Keep something safe
search	
trusted	
online	
shared	
accessed	

Assessment points

- **Describe** what a network is
- **Identify** devices that connect to networks
- **Use** a device to connect to the Internet
- **Compare** how content can be added and accessed online
- **Explain** who owns the Internet
- **Demonstrate** how information is shared online
- **Evaluate** whether a web search can be trusted

National Curriculum Coverage

- 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.

Minimum expectations, including for pupils with SEND
Children will be able to identify devices that can connect to the Internet. With support, children can explain what a network is.

High prior attainment and extension opportunities, including for pupils with SEND

Children to think about, discuss and reason why some web searches can't be trusted.

Cycle B – Computing – LKS2 – Unit 2: Audio Production

Objective
To work with sound digitally

I wonder...
How can I record a podcast?

Substantive Knowledge (Content)

- To know that sound can be recorded on devices
- To know that audio is sound that is within the acoustic range of human hearing
- To know that an input device is a piece of hardware that sends audio or sound data to the computer i.e. microphone
- To know that an output device is a piece of hardware that converts the signals sent by your computer into sounds that you can hear i.e. a speaker
- To know that audio can be edited through various apps
- How podcasts can be more engaging if you keep things concise and entertaining
- To be able to record audio content
- To be able to combine audio
- To be able to describe the difference between a project and audio file is
- To know that the strengths of an audio recording include easier to produce, use less bandwidth making it easier to download
- To know the weaknesses of an audio recording are they are not interactive, and they do not provide the visual elements

Prior Learning
EYFS
Exploring the sounds that musical instruments make. Experiment with rhythm and beat.
KS1
Children have learnt about making digital music.

Future Learning
UKS2
Children will continue to develop their knowledge and understanding of computing systems and online collaborative working.
KS3
Children will undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

audio	Sound that has been recorded
podcast	An audio file that users can stream or download and listen to
digital	Electronic technology that generates, stores, and processes data
project	A piece of work that is planned or intended
file	A document stored on the computer
record	
sound	
content	
engaging	

Assessment points

- **Describe** what a podcast is
- **Identify** input and output devices
- **Experiment** with sound using a computer
- **Use** a sound recording device to record audio
- **Discuss** ideas about how to make a podcast more engaging.
- **Compare** the strengths and weaknesses of a podcast
- **Explain** what the difference between a project and audio file is
- **Demonstrate** how to combine and edit audio
- **Evaluate** the quality of a project
- **Create** an audio file
- **Review** and refine our computer work

National Curriculum Coverage

- 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

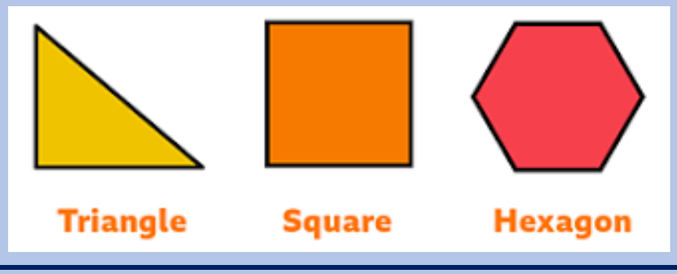
Minimum expectations, including for pupils with SEND
Children will be able to suggest ideas about how to make a podcast more engaging. With support, children can record and edit an audio file.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason if the intended audience makes a difference as to how a podcast is made.

Cycle B – Computing – LKS2 – Unit 3: Repetition in Shapes

Objective
To create programs by planning, modifying, and testing commands to create shapes and patterns

I wonder...
How does a computer make shapes?



Substantive Knowledge (Content)

- To know that a screen turtle is a cursor that moves around the screen
- To be able to create a code snippet
- To be able to write letters using code
- To know that repeat in computer terms refers to the process of looping or repeating sections of a computer program
- To be able to use loops to create shapes
- To be able to break tasks down into smaller parts
- To be able to create a program that includes count-controlled loops

Prior Learning

EYFS
Children have used devices to play games.

KS1
Children have used programming with bee bots.

Future Learning

UKS2
Children will explore variables in games.

KS3
Children will design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

repetition	Something that is used multiple times
turtle	A cursor that moves around the screen
loop	Things that repeat
count-controlled	A loop that continues for a determined number of times
function	A mathematical object that produces an output, when given an input
program	
code	
algorithm	
shape	
snippet	

Assessment points

- **Describe** what a screen turtle is
- **Identify** some basic commands
- **Experiment** algorithms to create letters
- **Use** the loop function as part of a program
- **Discuss** ideas about how the loop function makes things easier
- **Compare** coding that does and doesn't using the loop function
- **Explain** how the loop function works
- **Demonstrate** how to use coding to make a shape
- **Create** a program that uses the loop function
- **Evaluate** the success of their coding

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children will be able to explain what the loop function is. With support, children can use the loop function to create a shape.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason whether he loop function can be used in computer games.

Cycle B – Computing – LKS2 – Unit 4: Data Logging

Objective
To collect and access data captured over long periods of time

I wonder...
When is the hottest part of the day?

Substantive Knowledge (Content)

- To know that time series data is a collection of observations obtained through repeated measurements over time
- To know that data is collected over time because it allows organizations to measure the effectiveness of a given strategy
- To be able to use a digital device to collect data
- To know that data logging is the process of collecting and storing data over a period of time in different systems or environments
- To know that computers help analyse data through data logging systems
- To that relevant and true data is needed to answer questions
- To be able to interpret data
- To be able to answer questions about data

Prior Learning

EYFS
The children have had experience making tally charts and creating simple pictograms during their maths sessions and adult led activities.

KS1
Children have been learning about interpreting information using pictograms.

Future Learning

UKS2
Children will continue to use data in tables and graphs, including spreadsheets

KS3
Children will understand how instructions are stored and executed within a computer system.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

data	A collection of information
data-logger	A device that records data over time
capture	To grab or collect something
analyse	To examine and explain something
interpret	To read and understand something
answer	
time	
period	
collect	

Assessment points

- **Describe** what a data logging device is
- **Identify** a digital data logging device
- **Experiment** using a data logging device
- **Use** a data logging device to collect data
- **Discuss** why data is collected over time
- **Compare** data that has been collected
- **Explain** what the data tells us
- **Evaluate** the success of their data logging in order to answer questions

National Curriculum Coverage

- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- 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

Minimum expectations, including for pupils with SEND
Children will be able to explain what a data logging device is. With support, children will be able to use a data logging device to collect data.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason who might use data logging as part of their job.

Cycle B – Computing – LKS2 – Unit 5: Photo Editing

Objective
To develop an understanding of how digital images can be changed and edited

I wonder...
Where can I find this animal?

Substantive Knowledge (Content)

- To know that a digital image is a picture that is stored on a computer
- To know that images can be edited digitally using software
- To be able to change colours in an image
- To know that cloning is making of an exact copy of an object,
- To be able to use cloning in photo editing
- To know that editing, cloning and cropping tools can be used to copy images
- To be able to combine images
- To be able to evaluate changes to an image

Prior Learning

EYFS
Children have explored photography apps.

KS1
Children will be learning more about digital photography.

Future Learning

UKS2
Children will be learning about 3D modelling.

KS3
Children will be learning to create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

photo	A picture taken with a camera
image	A picture
edit	To correct, cut, add to, or change
cloning	To make a copy of something
combine	To put things together
colour	
digital	
change	
evaluate	
tool	
camera	

Assessment points

- **Describe** what a digital image is
- **Identify** some basic editing tools
- **Experiment** using editing tools
- **Use** specific tools for particular editing
- **Discuss** why people make changes to images
- **Compare** original and edited images
- **Explain** how to edit an image
- **Demonstrate** how to edit an image
- **Create** an edited image
- **Evaluate** the edited changes made to an image

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children will be able to explain what a digital editing is. With support, children can use some editing tools to change an image.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason who and why people choose to use image editing tools.

Cycle B – Computing – LKS2 – Unit 6: Repetition in Games

Objective
To explore the concept of repetition in programming

I wonder...
How many lives does a cat have?

Substantive Knowledge (Content)

- To know that a count-controlled loop is a loop that continues for a determined number of times
- To know that an infinite loop is never ending
- To be able to use loops as part of animation
- To be able to modify a game
- To be able to design a game using loops
- To be able to create a game using loops

Prior Learning

EYFS
Children have explored programming using bee bots during play.

KS1
Children have learnt about robot algorithms.

Future Learning

UKS2
Children will explore variables in games.

KS3
Children will understand several key algorithms that reflect computational thinking.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

loop	Things that repeat
count-controlled	A loop that continues for a determined number of times
infinite	Never ending
design	to think up and plan something
programming	Input instructions
code	
repetition	
effect	
game	

Assessment points

- **Describe** what is meant by the word loop
- **Identify** different types of loops
- **Experiment** using loops as part of coding
- **Use** loops to design and create a game
- **Discuss** why loops are useful for creating games
- **Compare** count-controlled and infinite loops
- **Explain** the effect of different loops
- **Demonstrate** how loops work
- **Create** a game that uses loops
- **Evaluate** games that use a loop

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children will be able to explain what count-controlled and infinite loops are. With support, children can use loops as part of coding.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason why loops are used in many computer games.

Cycle B – Computing – UKS2 – Unit 1: Communication and Collaboration

Objective
To explore how data is transferred over the internet

I wonder...
What is the quickest way to send a message?

Substantive Knowledge (Content)

- To know that data is transferred over the Internet by being translated into pulses of light or electricity, also called "bits," and then interpreted by the receiving computer
- To know that an Internet address is a unique address that identifies a device on the internet or a local network known as an IP address
- To know that we have Internet addresses so that the Internet can differentiate between different computers, routers, and websites.
- To know that a data packet has two sections the header and the payload. The header contains information about the packet, such as its origin and destination IP addresses (an IP address is like a computer's mailing address). The payload is the actual data
- To know that people work together by sharing information online and it is called online collaboration
- To know that that different ways online collaboration include: text, messaging, video conferencing, digital meeting platforms
- To know we communicate using technology through phones, PCs, blogs, online chat, social media, podcasts
- To be able to evaluate the different methods of online communication

Prior Learning
EYFS
Children have used the Internet to support their learning.

KS1
Children have used search engines to find information in the context of their learning.

LKS2
Children have learnt about networks including the Internet.

Future Learning

KS3
Children will learn about the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

Internet	Connecting millions of computers worldwide
data packet	A unit of data made into a single package that travels along a given network path
address	A specific location
communicate	The sharing or exchange of messages, information, or ideas
transfer	To pass from one person, place, or situation to another
collaboration	
online	
message	
technology	
network	
data	

Assessment points

- **Describe** how data is transferred over the Internet
- **Identify** Internet addresses
- **Discuss** why we have Internet addresses
- **Compare** how people work together online
- **Explain** how we communicate using technology
- **Demonstrate** how data is transferred over the Internet
- **Evaluate** different methods of online communication

National Curriculum Coverage

- 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

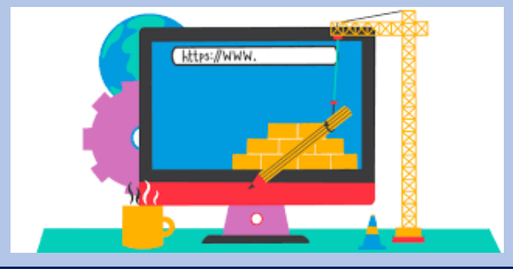
Minimum expectations, including for pupils with SEND
Children will be able to identify ways in which people work together online. With support, children can explain how data is transferred over the Internet.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason who and why working together online is useful.

Cycle B – Computing – UKS2 – Unit 2: Web Page Creation

Objective
To explore the creation of website for a chosen purpose

I wonder...
How do you make a good website?



Substantive Knowledge (Content)

- To know a site that is well designed, easy to use, full of quality content makes a good website
- To know that webpage is a single document on the web using a unique URL,
- To know that a website is a collection of multiple webpages in which information on a related topic is linked together under the same domain address
- To know that the common features of a web page include: Website logo, Menu, Header, Body, Highlighted content, Call to action (Buttons), Search bar, Forms, Feed Content, Footer, Social Media Links, Embedded Content
- To be able to plan the layout of a web page
- To know that fair use allows you to use content from others but without making money off of it and a copyright gives you full ownership of the work, allowing you to claim it as your own and potentially make money off of it
- To be able to add content to a web page
- To know that navigation paths are based on clicks and other user interactions, directing them along a predetermined route through the site
- To be able to create links on a website

Prior Learning
EYFS
Children have used devices to play games.
KS1
Children have continued to use these technologies for learning and for enjoyment.
LKS2
Children have learnt to use programming to make games.

Future Learning
KS3
Children will undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

website	A location on the World Wide Web
web page	A page within a website
layout	A plan or outline showing how something is to be built or carried out
feature	Something that attracts attention
navigation path	The way that pages are linked together
hyperlink	
Copyright	
fair use	
content	

Assessment points

- **Describe** what a website is
- **Identify** common features of a web page
- **Experiment** using different layouts for a web page
- **Use** hyperlinks as part of a web page
- **Discuss** what makes a good website
- **Compare** websites for a chosen purpose
- **Explain** what a navigation path is
- **Demonstrate** how to plan a web site
- **Create** a web site
- **Evaluate** the user experience of a website

National Curriculum Coverage

- 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.

Minimum expectations, including for pupils with SEND
Children will be able to explain the difference between a website and a web page. With support, children will be able to add content to a web page.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss the difference between copyright and fair use.

Cycle B – Computing – UKS2 – Unit 3: Variables in Games

Objective
To explore the concept of variables in programming through games

I wonder...
How does a scoreboard work?

Substantive Knowledge (Content)

- To know that a variable is something that can be changed
- To know that variables can be changed through programming
- To know that variables are used in programming to store information to be referenced and manipulated in a computer program
- To be able to change variables in a program
- To be able to design a game using variables
- To know that naming variables is useful to give clarity to users
- To be able to name variables
- To be able to test code
- To be able to evaluate the success of a game

Prior Learning

EYFS
Children have used devices to play games.

KS1
Children have used programming with bee bots.

LKS2
Children have been using programming to make games.

Future Learning

KS3
Children will design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

variable	Something that can be changed
programming	Writing a group of instructions for a computer to process
naming	To give something a name
test	To try something out
coding	Using a set of instructions to communicate with computers
change	
scoreboard	
game	

Assessment points

- **Describe** what a variable is
- **Identify** some variables used in programming
- **Experiment** naming variables
- **Use** variables as part of a game
- **Discuss** why variables are used in programs
- **Compare** what happens in a game when the variables change
- **Explain** what a variable is
- **Demonstrate** how to change a variable
- **Create** a game using variables
- **Evaluate** the success of a game

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children will be able to explain how different pieces of music make them feel (e.g., happy/ sad/ angry). With support, children will explore the music app and create a musical pattern using a computer.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about and discuss programs use variables to help make real-life easier.

Objective
To explore how to use a spreadsheet

I wonder...
What kind of sheet can hold data?

Substantive Knowledge (Content)

- To know that a spreadsheet is a computer program that can capture, display and manipulate data arranged in rows and columns
- To be able to create a data set in a spreadsheet
- To be able to format a spreadsheet
- To know that a formula is an expression that operates on values in a range of cells or a cell
- To be able to use a formula
- To know that a spreadsheet can be used to plan an event through tracking and managing data i.e. ticket sales for a concert
- To know that a chart is a visual representation of data
- To be able to produce a chart using a spreadsheet

Prior Learning

EYFS
The children have had experience making tally charts and creating simple pictograms during their maths sessions and adult led activities.

KS1
Children have been learning about interpreting information using pictograms.

LKS2
Children have been learning about data logging.

Future Learning

KS3
Children will understand how instructions are stored and executed within a computer system.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

spreadsheet	a type of computer software that allows its user to store and analyse data
structure	Anything made up of parts held together in a particular way
formula	A group of mathematical symbols and numbers that show how to work something out
data	A collection of information
chart	A graphical representation of data
cell	
row	
column	
event	
data set	
heading	
total	
calculate	

Assessment points

- **Describe** what a spreadsheet is
- **Identify** how spreadsheets are constructed
- **Experiment** adding a data set to a spreadsheet
- **Use** a formula as part of a spreadsheet
- **Discuss** why formulas are useful in spreadsheets
- **Compare** electronic vs paper-based plans
- **Explain** how a spreadsheet can be used to plan an event
- **Demonstrate** how to produce a chart using a spreadsheet
- **Create** an event plan using a spreadsheet
- **Evaluate** the benefits of using a spreadsheet

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children will be able to add data to spreadsheet. With support, children will be able to use a formula as part of a spreadsheet.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason who and why people use spreadsheets.

Cycle B – Computing – UKS2 – Unit 5: 3D Modelling

Objective
To develop knowledge and understanding of using a computer to produce 3D models

I wonder...
How can a computer help keep your desk tidy?

Substantive Knowledge (Content)

- To know that a 3D model is essentially made up of vertices, which come together to form a mesh and act as the core of the 3D mod
- To able to add 3D shapes to a project
- To be able to view 3D shapes from a different perspective
- To be able to modify 3D shapes
- To be able to make a digital 3D model
- To know that 3D models are important for real world structures because it helps designers identify potential design issue and saves on construction costs

Prior Learning

EYFS
Children have explored photography apps.

KS1
Children have learnt about digital photography.

LKS2
Children have learnt about photo editing.

Future Learning

KS3
Children will understand how instructions are stored and executed within a computer system.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

3D	Something that has 3 dimensions
model	A representation of something
structure	Anything made up of parts held together in a particular way
modify	To change the appearance of something
perspective	The way you see something
shape	
real world	
computer	
object	

Assessment points

- **Describe** what a 3D model is
- **Identify** the different dimensions used for 3D models
- **Experiment** adding 3D shapes to a project
- **Use** tools to modify 3D shapes
- **Discuss** why 3D models are used
- **Compare** what happens to an object when it is moved along different dimensions
- **Explain** why 3D models are important for real world structures
- **Demonstrate** how to plan shape
- **Create** a 3D shape
- **Evaluate** a 3D model

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children will be able to explain what a 3D model is. With support, children can modify a 3D shape.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason who and why people use 3D models.

Cycle B – Computing – UKS2 – Unit 6: Sensing Movement

Objective
To develop a program to use inputs and outputs on a controllable device

I wonder...
How can a computer help us keep fit?

Substantive Knowledge (Content)

- To know that a controllable device is a device that can be controlled through technology
- To know that input is the information entered into a computer system, examples include: typed text, mouse clicks,
- To know that processing is the process of transforming input information into and output
- To know that output is the visual, auditory, or tactile perceptions provided by the computer after processing the provided information
- To be able to create a program for a controllable device
- To know that an If, Then, Else statement is a high-level programming language statement that compares two sets of data in memory and tests the results
- To be able to use an If, Then, Else statement
- To know the order of commands is important for the programme to run as it should
- To be able to design a project that uses a controllable device
- To be able to develop a program that uses inputs and outputs as part of a controllable device

Prior Learning

EYFS
Children have explored programming using bee bots during play.

KS1
Children have learnt about robot algorithms.

LKS2
Children have learnt about repetition in programming.

Future Learning

KS3
Children will understand several key algorithms that reflect computational thinking.

Skills

Using computing systems and networks	Systems, networks and how they are used, the internet, hardware and software
Programming	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
Using data and information	collecting, analysing, evaluating, presenting data and information
Creating media	design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content

Concepts

Responsibility	Being safe online, using social media responsibly and respectfully, privacy, cyberbullying
Similarity and difference	Making comparisons, finding patterns, noting differences and drawing conclusions
Cause and consequence	Inputs and outputs, programming
Significance	Significant inventions, significant figures from the world of computing
Chronology	Changes in technology over time, inventions, future technology
Written and oral expression	Using Computing terminology

Key vocabulary

controllable device	A device that can be controlled
input	Information that is "put in" to something
process	A series of stages in time
output	What comes out of something
If, Then, Else	A conditional statement that runs a different set of statements depending on whether an expression is true or false
command	
statement	
program	
micro:bit	
sensor	
MakeCode	
random	
accelerometer	
motion	
conditional statement	

Assessment points

- **Describe** what a controllable device is
- **Identify** inputs, processes and outputs
- **Experiment** using a controllable device
- **Use** a controllable device with a created program
- **Discuss** why we use controllable devices
- **Compare** what happens when the order of commands is changed
- **Explain** how an If, Then, Else statement works
- **Demonstrate** an If, Then, Else statement
- **Create** a program that uses inputs and outputs as part of a controllable device
- **Evaluate** the success of the program created

National Curriculum Coverage

- 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

Minimum expectations, including for pupils with SEND
Children will be able to explain what a controllable device is. With support, children will be able to use a controllable device.

High prior attainment and extension opportunities, including for pupils with SEND
Children to think about, discuss and reason who and why people use controllable devices.