Sheep Dip Primary School

Scheme of Learning for Computing

# Sheep Dip essentials for this subject:

* All children to be discerning users of the internet and to have an understanding of when to use it.
* To be confident and creative users, open to new ideas of learning.
* To treat all equipment with respect.
* To use technology safely and respectfully: keeping personal information private, identify steps needed to remain safe and where

to go for support.

* Children to start to use technology purposefully in a range of context ensuring that the end product if fit for purpose.
* To gather the knowledge and understanding to become an active participant in the digital world.

**Whole School Coverage Overview.**

Within each year group Computer Science, Information Technology and Digital Literacy statutory requirements are interwoven in the units across both Key stage 1 and Key stage 2.

|  |  |
| --- | --- |
| Year Group | ICT Coverage Summary Overview |
| Yr 1 | We are treasure hunters; We are tv chefs; We are painters; We are collectors; We are storytellers ; We are celebrating |
| Yr 2 | We are astronauts; We are games testers ; We are photographers; We are researchers; We are detectives; We are zoologists |
| Yr 3 | We are programmers; We are bug fixers; We are presenters; We are network engineers; We are communicators;  We are opinion pollsters |
| Yr 4 | We are software developers; We are toy designers; We are musicians; We are HTML editors; We are co-authors; We are meteorologists |
| Yr 5 | We are game developers; We are cryptographers; We are artists; We are web developers; We are bloggers;  We are architects |
| Yr 6 | We are app planners; We are project managers; We are market researchers; We are interface designers;  We are app developers; We are marketers |

# Computing Year 1

|  |  |
| --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills |
| **Computer Science**   * **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.** | **We are treasure hunters**   * To follow instructions. * To record a set of instructions. * To program a toy. * To be able to give instructions. * To understand what input, program and output means   for a robot toy   * To be able to create a program. * To identify and correct mistakes in a program (debug). * To be able to predict where a set of instructions will   take a toy or person.   * To search for ways to make a program work better.   **We are tv chefs**   * To write and/or draw the steps of a recipe. * To be able to change my recipe to make it better. * To understand what will happen when others use my recipe. |

|  |  |
| --- | --- |
| **Information Technology**   * **Use technology purposefully to create, organise, store, manipulate and retrieve digital content.** | **We are chefs**   * To use a video camera to record video. * To be able to move files from the camera onto the computer. * To be able to edit video.   **We are painters**   * To be able to use a paint program. * To be able to edit an image. * To use a paint program to show details of a character. * To be able to put more than one image into a document. * To be able to save work. * To be able to save a document in a portable format, for example PDF. * To be able to find images on the web. * To provide helpful feedback to a friend. * To understand how images are stored on a computer   **We are collectors**   * To find pictures on the web. * To be able to copy a picture and put it in a presentation. * To be able to pictures in a presentation. * To resize pictures. * To sort pictures in order of size. * To choose the best pictures for a collection * To know that there are some pictures you can copy and some that you can’t. * To put pictures into groups. * To use yes or no questions to find a picture. * To be able to see how drawings and photos are different.   **We are storytellers**   * To practise the sound effects for my book. * To record the sound effects. * To listen to the sound effects and make them even better. * To practise the dialogue for my book. * To record the dialogue. * To listen to the dialogue and make it even better. * To put the sound effects and dialogue together in my book. * To give helpful feedback to my friends. * To save my work and open it when I next need it. * To understand how my recording is saved on the computer. |
|  | **We are collectors**   * To look for pictures on the web. * To copy a picture and put it in my presentation. * To move pictures in my presentation. * To resize pictures. * To sort pictures in order of size. * To resize pictures. * To sort pictures in order of size. * To choose the best pictures for my collection * To know that there are some pictures I can copy and some that I can’t. * To put pictures into groups. * To use yes or no questions to find a picture. |

|  |  |
| --- | --- |
| **Digital Literacy**   * **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.** | **We are treasure hunters**   * To be able to give examples of input, program and Output in general contexts.   **We are painters**   * To understand how digital images are created.   **We are story tellers**   * I can see how talking books and reading books are different.   **We are collectors**   * I can see how drawings and photos are different.   E-Safety  **We are treasure hunters**: The children learn to use simple programmable toys safely and sensibly, as well as showing respect for the work of their peers. Web access is supervised and safe practices are encouraged. Similarly, any filming is done with appropriate consent and assent.  **We are TV chefs**: The pupils learn how to use digital video cameras safely and to show respect to those they are filming, including recognising the need for consent and assent. The importance of not sharing videos more widely than is appropriate is considered, as is the need to exclude information that might identify individuals from video recordings. When using the web, pupils learn to turn the screen off and tell their teacher if they encounter material that concerns them. The pupils also start to learn about copyright, recognising that they own the copyright in their original work and that this cannot be published or copied without their permission.  **We are painters**: In searching for images on the web, pupils work initially from a set of carefully chosen sites. They again learn that they should turn the screen off and tell their teacher if they encounter material that concerns them. If work is uploaded to a public area, the importance of protecting the children’s identities is recognised, as is their intellectual property rights over their original work. An extension activity provides an initial opportunity for the children to learn some aspects of using email safely.  **We are collectors**: As pupils will be working with the web and searching for images, they’ll need to make sure they use this technology safely, as well as showing respect for others’ intellectual property through observing copyright conditions. The pupils are taught to turn the screen off and let their teacher know if they have any concerns over content they encounter. The pupils are also introduced to the school’s Acceptable Use Policy, if they haven’t already had this explained.  **We are storytellers**: The pupils learn to use audio recorders or microphones and audio recording software safely and sensibly. The pupils need to be aware of copyright material, and show appropriate respect for the owners of intellectual property when using technology. Regard is shown for appropriate consent and assent, school policies and third party terms and conditions if the pupils’ stories are uploaded to external websites.  **We are celebrating:** The pupils have an opportunity to search for images on the web, and again learn to use technology safely, switching off the screen if they have concerns, and reporting these to their teacher. The pupils are taught to respect the copyright conditions associated with any third party images they use. Pupils only use photos of themselves if appropriate permission is in place. If children share their work, then attention is paid to protecting their identity and copyright. If they send cards by email they use a class address and consider some aspects of using email safely.  . |

Year 2

|  |  |
| --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills |
| **Computer Science**   * **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.** | **We are astronauts**   * To plan a route from one place to another. * To plan a route to more than one place. * To pretend to be a robot and follow instructions. * To program a toy. * To program a sprite to move in Scratch. * To program a sprite to move in Scratch using blocks * To predict where instructions will take a person, toy or sprite. * To record instructions to move a toy or sprite from one place to another. * To record instructions to move a toy or sprite to more than one place. * To spot and correct mistakes in a program (debug). * To solve problems. * To consider the most efficient solution to a problem.   **We are games testers**   * To talk about what happens in a computer game. * To see that a computer game works by following instructions. * To see how computer games are similar. * To predict what will happen in a computer game. * To test a computer game. * To find and understand the code for a computer game in scratch. * To change the code for a computer game in Scratch to make it work better. |

| Statutory requirements ( National curriculum) | | Key Knowledge and Skills |
| --- | --- | --- |
| **Information Technology**   * **Use technology purposefully to create, organise, store, manipulate and retrieve digital content.** | | **We are photographers**   * To take photos. * To take photos that are in focus. * To take high quality photos. * To decide if a photo is worth keeping. * To edit photos. * To edit photos to make them look better. * To choose my best photos for our class collection. * To talk about how I took, edited and chose my best photo * To give helpful feedback to my friends.   **We are researchers**   * To add questions to a mind map. * To organise questions in my mind map. * To find information to add to my mind map. * To use search engines. * To use the web to find information. * To understand that it is important to say where I found information. * To understand that there are some images I can copy and some that I can’t. * To find images and add them to my presentation. * To create a presentation that shows my research. * To use my presentation to teach others about a topic. * To make my presentation fun and interesting. * To present my information clearly   **We are detectives**   * To be able to read an email. * To write and reply to an email. * To check my email for mistakes before I send it. * To see if an email and an attachment are from someone I know and trust. * To read and understand the headers of an email. * To know how important it is to type an email address correctly. * I can see that the domain name in an email address gives important information. * I can take notes from an email in writing or using an audio recorder. * I can create a spreadsheet. * I can organise a spreadsheet so it shows me the information I need. * I know what to do if I’m worried about opening an email. * I know that I must always be careful about opening emails and attachments. |
|  | | * To be able to see how an email address has two parts. * To see that the domain name in an email address gives important information. * To be able to take notes from an email in writing or using an audio recorder. * To create a spreadsheet. * To organise a spreadsheet so it shows me the information I need.   **We are zoologists**   * I can take photos of bugs. * I can take photos of bugs that are in focus and of high quality. * I can edit my photos (e.g. cropping). * I can label my photos and rate them. * I can move my photos onto the computer or to a website. * I can use yes or no questions to decide which group a bug fits into * I can create a chart. * I can add a title and label the axes of my chart. * I can change the way my chart looks. * I can show my results in different types of charts. * I can create a presentation showing my research. * I can present my research to my friends. | |

|  |  |
| --- | --- |
| * + **Digital Literacy** * **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.** | **We are game testers**   * I know that some games are for older children. * I can see why it can be hard to stop playing computer games. * I know that I need to limit the time I spend playing computer game   **We are detectives**   * To know what to do if I’m worried about opening an email. * I know that I must always be careful about opening emails and attachments.   **We are zoologists**   * I can use a digital map to find a place. * I can use GPS to show where I found my bugs. * I can add photos to a digital map. * I can add information about my bugs to a digital map   + - E-Safety   **We are astronauts** The pupils must let their teacher know if they encounter inappropriate material when they search the web. If the pupils use third-party images in their projects, they should use images with public domain or Creative Commons licences. The pupils may upload their projects to the Scratch website, if they have registered for accounts using a parent’s e-mail address. They learn to observe MIT’s terms and condition.  **We are games testers** There are concerns about the violent nature of some games. Choosing games wisely, including observing PEGI age restrictions and playing in moderation, are aspects of the safe and respectful use of technology that pupils learn about in this unit. As in Unit 2.1, the pupils may upload their projects to the Scratch website, if they have registered for accounts using a parent’s e-mail address. Comments on the Scratch website are not moderated before they appear, although the pupils can report any which are inappropriate. This provides an opportunity to learn about where to go for help and support when they have concerns about content or contact.  **We are photographers** The children learn that once images are posted online, it’s impossible to control what happens to them. Facial recognition software and geotagging mean that those posting images might inadvertently fail to keep some personal information private. The children learn how to minimise these risks, and learn what they should do if they have concerns about images they encounter on the web. The children also learn about what is acceptable and unacceptable to photograph, for example, that it is usually not a good idea to take or share photographs in which children can be identified, or that might reflect badly on the school.  **We are researchers** The pupils consider how to stay safe while researching online, and show respect for others’ ideas and intellectual property by citing their sources, and using licensed images. Safe search filters are in place for using Google or Bing and school internet access is filtered.  **We are detectives** The pupils learn about some of the risks associated with email. They learn that attached files can contain viruses or other harmful programs, that email addresses and embedded links can be ‘spoofed’, and that ‘spam’ is a common problem. It is recommended that all emails are sent and received via a single class email address. The password for this account is not shared with children. If the children do use individual accounts, they’ll need to keep their account details private and share their email address only with people they know and trust.  **We are zoologists** The pupils again learn that when sharing photographs and geo-location information online they need to consider the importance of keeping personal information private; they achieve this by not including names or photographs of people. The pupils are taught to respect rules for using digital equipment when out of the classroom, to ensure the equipment is kept safe and that they are not so focused on using it that they become unaware of risks around them. keep their account details private and share their email address only with people they know and trust.  **We are zoologists** The pupils again learn that when sharing photographs and geo-location information online they need to consider the importance of keeping personal information private; they achieve this by not including names or photographs of people. The pupils are taught to respect rules for using digital equipment when out of the classroom, to ensure the equipment is kept safe and that they are not so focused on using it that they become unaware of risks around them. |

Year 3

|  |  |
| --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills |
| **Computer Science**   * **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.** * **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.** | **We are programmers**   * To create a storyboard for an animation. * To include action and dialogue in my storyboard. * To write a computer program for an animation. * To put Scratch blocks in the right order. * To correct mistakes in my program. * To create sound and graphics for my animation. * To explain how my storyboard and program are linked. * To use a *repeat* block in my program. * To find and correct ‘bugs’ in my program.   **We are bug fixers**   * To correct ‘off-by-one’ mistakes in a program * To make a simple drawing program work better. * To put the dialogue in a program in the right order. * To try out different variables in a simulator game’s program. * To describe how a simple maths program works * To describe how a simple drawing program works * To describe how the dialogue in a program works. * To correct a program so the animation is more realistic. * To describe how a simulator game’s program works. * To explain how I correct ‘bugs’ in a program. * To explain how the steps in a program are linked. * To explain how I correct the order of dialogue in a program * To describe how a ‘Pong’-style program works * To suggest reasons for the ‘bug’ in the simulator game’s program. |

|  |  |  |
| --- | --- | --- |
| **Information Technology**   * **Use search technologies effectively, appreciate how results are selected and ranked.** * **Select, use and combine a variety of software (including internet services) on a range of digital** | | **We are presenters**   * To work a video camera. * To record footage to use in my video. * To upload and edit my footage on a computer. * To record an audio commentary for my video. * To study sports programmes to learn how they are filmed * To record high quality footage. * To record an audio commentary with useful information in it * To export my final video in a standard format. * To look at my footage and decide what does and doesn’t work. * To record original and interesting footage. * To use and explain data in my audio commentary. * To use more difficult editing tools, e.g. creating transitions.   **We are network engineers**   * To name some of the hardware that connects computers. * To take part in an activity to show how data passes across the internet * To use the ping, ipconfig and tracert commands. * To describe the way hardware works to connect computers. * To describe how data passes across the internet. * To describe how the ping, ipconfig and tracert commands are used.   **We are opinion pollsters**   * To collect data through the internet. * To show respect for the information people tell me. * To use software to collect data. * To use software to present the results of my data. * To explain how I have used the web to work with others on documents. * To judge how useful my survey forms and presentations are. * To move information between different applications. * To look at data and explain what it shows me. * To work independently to collect, present and judge data. |
| **Digital Literacy**   * **Understand the opportunities [networks] offer for communication and collaboration** * **Be discerning in evaluating digital content** * **Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact** | | **We are programmers**   * To upload my animation to the Scratch website. * To get ideas from the Scratch website.   **We are network engineers**   * To be able to see and understand how networks keep   me safe online.   * To talk about how my classroom computer is linked to   a web server abroad.   * To talk about some of the different ways data is   passed across the internet.   * I can talk about the output from the ping, ipconfig,   tracert and nslookup commands.  **We are communicators**   * To see how email and video conferencing work on the internet. * To use email and video conferencing to communicate * To write an email and speak on video to communicate with others. * To follow my school’s rules and use email and video conferencing safely. * To see that the internet and the web are different. * To work with my partner well. * To show respect for my partner’s ideas. * To let my teacher know if I am unsure about something in an email. * To work independently with my partner to plan our work. * To tell my partner what I think does and doesn’t work. * To be able to explain some of the dangers of emails and opening email   Attachments  **We are opinion pollsters**   * To collect data through the internet. * To explain how I have used the web to work with others on documents. * To see how important it is to keep a person’s data private. * To judge my data and see what does and doesn’t look right.   E-Safety  **We are programmers** The pupils need to consider copyright when sourcing images for their programs and/or uploading their own work to the Scratch community site. Searching for content for programs or viewing others’ cartoons also offers an opportunity to develop safe search habits. If the pupils participate in the Scratch community, they need to think about what information they can share and how to participate positively in an online community, as well as obtaining parental permission.  **We are bug fixers** The pupils could consider the implications of bugs in software. Participating in the Scratch community would enable the pupils to help others with their projects as well as allowing them to receive help on their own. Participation requires parental permission, and the pupils should consider what behaviour is acceptable online.  **We are presenters** In filming one another, the pupils need to ensure that the appropriate permission has been obtained, and that they act respectfully andresponsibly when filming, editing and presenting their work. The pupils should think through the implications of videos being made available on the school network or more widely via the internet. They should discuss why schools and other organisations have strict policies over filming.  **We are network engineers** The pupils learn about how networks, including the internet, operate. They learn that data transmitted via the internet is not always encrypted. They consider some of the implications for privacy, e.g. their ‘digital footprint’ associated with using the internet. They become aware of the importance of DNS for safe use of the internet. They learn to use command line diagnostic tools safely and responsibly.  **We are communicators** The pupils should think about the safe use of email. They learn how  email can be used positively. They become aware of some of its risks, including malware attachments, hacked accounts, spam and spoofed links, but also learn how their exposure to such risks can be reduced. They consider the importance of introductions in extending circles of trust. They learn how video conferencing can be used positively, to support learning with a known partner. **We are opinion pollsters** The pupils learn some of the legal and ethical requirements for designing online surveys and processing data. They also consider what pollsters information it would be appropriate for them to give in an online survey, and some implications of data processing. The pupils can use online tools for collaborating on survey design and analysis, considering how to use these appropriately. The survey itself could address issues of the pupils’ attitudes to online safety. | | |
|  | | internet. They become aware of the importance of DNS for safe use of the internet. They learn to use command line diagnostic tools safely and responsibly.  **We are communicators** The pupils should think about the safe use of email. They learn how  email can be used positively. They become aware of some of its risks, including malware attachments, hacked accounts, spam and spoofed links, but also learn how their exposure to such risks can be reduced. They consider the importance of introductions in extending circles of trust. They learn how video conferencing can be used positively, to support learning with a known partner.  **We are opinion pollsters** The pupils learn some of the legal and ethical requirements for designing online surveys and processing data. They also consider what pollsters information it would be appropriate for them to give in an online survey, and some implications of data processing. The pupils can use online tools for collaborating on survey design and analysis, considering how to use these appropriately. The survey itself could address issues of the pupils’ attitudes to online safety. | | |

# Computing Year 4

|  |  |
| --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills |
| **Computer Science**   * **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.** * **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.** | **We are software developers**   * To design an interactive educational game. * To develop an interactive educational game. * To put Scratch blocks in the right order. * To use the *if/then/else* block correctly. * To use the *random number* block and use variables to work out the score * To include sound in my game. * To correct mistakes in my game. * To plan my own way to program my game. * To use a countdown timer. * To use the mouse to control my game. * To explain how the algorithm of my game works.   **We are toy designers**   * To design a toy with computer-controlled input and output. * To write a program to show how my toy would produce output. * To use Scratch to test how input and output would work in my toy. * To use Scratch to work out why my toy may not work as expected. * To use Scratch to create a version of my toy with computer-controlled input and output. * To use Scratch to create a version of my toy using both mouse and keyboard input. * To find and correct ‘bugs’ in my program. * To be able to explain how I find and correct ‘bugs’ in my program. * To be able to work out ways around problems by breaking them into smaller steps. |

|  |  |  |
| --- | --- | --- |
| Statutory requirements ( National curriculum) | | Key Knowledge and Skills |
| **Information Technology**   * **Use search technologies effectively, appreciate how results are selected and ranked.** * **Select, use and combine a variety of software (including internet services) on a range of digital**   **services to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.** | | **We are musicians**   * To use sequencing software to create a piece of music. * To record my own sound samples * To mix sound samples to create a piece of music. * To export the file of my piece of music in a standard compressed format. * To edit sound samples. * To work on and make my piece of music better. * To edit my final piece of music. * To use software that uses staff notation. * To compare creating a piece of music to creating a program.   **We are HTML editors**   * To use some HTML tags. * To edit the HTML for a web page. * To create web pages that keep another person’s details private * To explain the parts of a URL. * To use the <a href=“...”>...</a> tag correctly. * To create a web page by writing HTML. * To use the <img/> and <iframe>…</iframe> tags.   **We are co-authors**   * To create content for a wiki. * To edit the content on my wiki. * To edit the HTML for a web page. * To work with others to plan a project. * To edit another person’s content. * To edit content on Wikipedia. * To plan a project by breaking it into smaller parts.   **We are meteorologists**   * To use weather measurement equipment safely. * To enter weather data in a spreadsheet * To take digital photos. * To create simple charts * To make predictions about the weather   .   * I can describe the weather. * I can make sensible predictions about the weather. * I can add measurements and descriptions to photos. * I can present an interesting and useful weather forecast to my classmates * I can spot weather data that looks unusual. * I can make accurate predictions. * I can see what some of the problems are in predicting the weather. |
|  | | * To create a presentation for my weather forecast. * To use weather measurement equipment accurately. * To describe the weather. * To make sensible predictions about the weather. * To add measurements and descriptions to photos. * To present an interesting and useful weather forecast to my classmates * To spot weather data that looks unusual. * To make accurate predictions. * To see what some of the problems are in predicting the weather.   **At this point, the children should be applying the skills learnt and starting to produce work which is tailored towards their intended audience and fit for purpose.** | |

|  |  |
| --- | --- |
| **Digital Literacy**   * **Understand the opportunities [networks] offer for communication and collaboration** * **Be discerning in evaluating digital content** * **Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact** | **We are musicians**   * To explain how technology can be used to create music. * To explain how people listen to and buy music through   technology.   * To respect other people’s copyright.   **We are html editors**   * To see how the internet and the web are different. * To see that web pages are written in HTML. * To see how important links are for the web. * To be safe and responsible when I create a web page. * To show that I understand how HTTP works. * To show that I know about the history of the web   **We are co-authors**   * To find and read an article on Wikipedia. * To show where I found information I used in my research * To work out if an article is accurate and reliable. * To see how important it is that content is fair and balanced. * To see how important Wikipedia’s Five pillars are.   E-Safety  **We are software developers** The pupils need to consider copyright when sourcing images or media for their programs and/or uploading their own work to the Scratch community site. Searching for content for their programs or viewing others’ games also offers an opportunity to develop safe search habits. If the pupils participate in the Scratch community, they need to think about what information they can share and how to participate positively in an online community, as well as obtaining parental permission.  **We are toy designers** The pupils again need to think carefully about copyright in sourcing  images and other media for their toy prototypes and presentations, or if uploading their own work to the Scratch community. If the pupils do participate in the online Scratch community, they should think through how to do so in a safe and responsible manner, and should obtain their parents’ consent. If the pupils link their programs to hardware, they need to take care to work safely with a range of tools and electronic equipment.  **We are musicians** The pupils need to think about copyright when sourcing audio or publishing their own compositions. They are encouraged to use Creative Commons licensed content if working with others’ audio files. There’s an opportunity to discuss how copyright relates to music performed in school as well as illegal downloading and sharing of copyrighted music.  **We are HTML editors** The pupils learn how easy it is to create content for the web. The unit provides an opportunity to address some of the risks of using the web, and how pupils could best keep themselves safe while doing so. They learn how easily web pages can be modified, which provides an opportunity to consider the reliability of web-based content.  **We are co-authors** The pupils learn about Wikipedia, considering some strategies for evaluating the reliability of online content as well as the rules and processes that the Wikipedia community has evolved. The pupils develop a shared wiki, thinking carefully about how to do so safely and responsibly, and considering what conduct is appropriate when collaborating on a shared resource.  **We are meteorologists** The pupils consider the importance of obtaining and using accurate data for any information-processing work. If the pupils film one another, they need to ensure appropriate permission is obtained and that recordings are made, edited and shown in safe, respectful and responsible ways. The pupils should think carefully about the implications of uploading their films to the school network or to the internet. |

|  |  |
| --- | --- |
|  | **We are co-authors** The pupils learn about Wikipedia, considering some strategies for evaluating the reliability of online content as well as the rules and processes that the Wikipedia community has evolved. The pupils develop a shared wiki, thinking carefully about how to do so safely and responsibly, and considering what conduct is appropriate when collaborating on a shared resource.  **We are meteorologists** The pupils consider the importance of obtaining and using accurate data for any information-processing work. If the pupils film one another, they need to ensure appropriate permission is obtained and that recordings are made, edited and shown in safe, respectful and responsible ways. The pupils should think carefully about the implications of uploading their films to the school network or to the internet. |

Year 5

|  |  |
| --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills |
| **Computer Science**   * **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.** * **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.** | **We are game developers**   * To create a storyboard or diagram for an algorithm for my game. * To create sound and graphics in Scratch for my game. * To put instructions in the right order for my game. * To find mistakes in my game. * To create and add music for my game. * To use selection and repetition in my game. * To correct mistakes in my game. * To listen to my partner’s ideas about my game and make it better. * To add instructions to my game. * To break my game into smaller parts and work on them separately. * To animate my characters by creating different graphics for them. * To use variables in my game. * To explain how my game works. * To add comments to the script of my game |

|  |  |
| --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills |
| **Information Technology**   * **Use search technologies effectively, appreciate how results are selected and ranked.** * **Select, use and combine a variety of software (including internet services) on a range of digital services to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.** | **We are cryptographers**   * I can send and receive messages in Morse code and semaphore. * I can create and decode secret messages using the Caesar and substitution ciphers. * I can see how important it is to keep passwords secret. * I can see how secret code needs to be used sometimes when using the web. * I can send and receive messages in Morse code and semaphore beyond the line-of-sight. * I can decode a message using the Caesar cipher without knowing the letter key shift. * I can see how important it is to create secure, hard-to-guess passwords. * I can check to see if a web page is in secret code (‘encrypted’). * I can explain how Morse code and semaphore are similar and different from the internet * I can explain the algorithm for the Caesar cipher. * I can decode a message which has used a random substitution cipher.   **We are artists**   * I can create a tessellating pattern. * I can write a program to draw a simple shape. * I can create a pattern using overlapping shapes. * I can create a pattern using different repeated shapes. * I can create a computer-generated image of a landscape. * I can create a tessellating pattern using more complicated shapes. * I can use repetition in Scratch to draw a complicated geometric shape. * I can use the tile clone tool to create a pattern using different kinds of shapes. * I can create a computer-generated image of a landscape that looks good. * I can write blocks of script in Scratch to create a complicated geometric shape. * I can explain how computers create realistic landscapes.   **We are web developers**   * I can check and comment on others’ content. * I can see how Google chooses and shows web pages in a search. * I can name other search engines. * I can create and organise others’ content on e-safety and using technology properly * I can create and organise others’ content for sharing worries about nformation seen and received on the web. * I can create and organise others’ content for using the web in the right/wrong way. * I can credit others’ information I use on the shared site. * I can decide if web sources are balanced and of a good quality. * I can proofread and correct mistakes in others’ content * I can use tools to get the best results in my web searches. * I can find and use information from different places to present a summary. * I can make useful and large changes to others’ content when necessary * I can explain how Google orders web pages in a search(‘Page Rank’). |

|  |  |
| --- | --- |
|  | * I can find and use information from different places to present a summary. * I can make useful and large changes to others’ content when necessary * I can explain how Google orders web pages in a search (‘Page Rank’).   **We are bloggers**   * I can see that the internet makes blogging possible. * I can write a blog post. * I can comment on a blog post. * I can add an image, audio or video to a blog post. * I can see what it takes to create a good blog post. * I can see that blog posts are stored as HTML. * I can comment with respect on others’ blog posts. * I can add an image, audio or video I have created to a blog post. * I can explain the difference between database-driven sites and static HTML pages. * I can blog about an event as it happens.   **We are architects**   * I can use the web to find out about virtual art galleries. * I can create simple objects using SketchUp. * I can create a simple gallery space in SketchUp. * I can add furniture to my gallery in SketchUp. * I can add my own artwork to my gallery. * I can create a virtual tour of my gallery. * I can find features that all art galleries share using the web. * I can create a detailed 3D object using SketchUp. * I can add textures and finishing touches to my gallery using SketchUp. * I can create a virtual tour of my gallery with an audio commentary. * I can create an attractive detailed 3D object using SketchUp * I can create a detailed series of rooms and spaces in SketchUp. * I can create furniture for my gallery in SketchUp. * I can use Movie Maker to edit the virtual tour of my gallery. |
|  |  |

|  |  |
| --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills |
| **Digital Literacy**   * **Understand the opportunities networks offer for communication and collaboration** * **Be discerning in evaluating digital content** * **Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact** | **We are cryptographers**   * I can see how important it is to keep passwords secret. * I can see how secret code needs to be used sometimes when using the web. * I can see how important it is to create secure, hard-to-guess passwords. * I can check to see if a web page is in secret code (‘encrypted’). * I can create a secure, hard-to-guess password. * I can check the security certificates for a web page.   **We are bloggers**   * I can use blogs safely and responsibly * I can let others know about blog posts or comments I am worried about. * I can see what is acceptable and unacceptable when commenting on blog posts * I can use others’ work in my blog with respect and in the correct way.   **E-safety**  **We are game developers** The pupils need to consider copyright when sourcing images or media for their games and/or uploading their own work to the Scratch community site. Searching for content for their games or viewing others’ games also offers an opportunity to develop safe search habits. If the pupils participate in the Scratch community, they need to think about what information they can share and how to participate positively in an online community, as well as obtaining parental permission. The pupils might also consider some personal implications of playing games, perhaps including violent computer games.  **We are cryptographers** The pupils learn how information can be communicated in secret over open channels, including the internet, using cryptography. They learn about the public key system used to sign and encrypt content on the web, and how they can check the security certificates of encrypted websites. They learn about the importance of password security for online identity and consider what makes a secure password.  **We are artists** The unit provides an opportunity to reinforce messages around safe searching and evaluating the quality of online content. If the pupils upload their work for others to see, they should consider the importance of protecting personal information as well as recognising that they are sharing their own copyrighted work with an audience.  **We are web developers** E-safety forms the focus of this unit, with the pupils working collaboratively to develop a website in which they present their own authoritative content on a broad range of issues around the safe and responsible use of technology. In doing so, they consider the reliability and bias of online content, how to contribute positively to a shared resource, and how to use search engines safely and effectively.  **We are bloggers** The pupils write content for their own or a shared blog, thinking carefully about what can be appropriately shared online. They consider issues of copyright and digital footprint as well as what constitutes acceptable behaviour when commenting on others’ blog posts. The pupils also think about the importance of creating high-quality online content and become more discerning in evaluating content as they review others’  blogs. If the pupils’ blogs are publicly accessible, it is important that any comments are moderated by their teacher; it is worth discussing with the pupils why the comments should be moderated.  **We are architects** The pupils should observe good practice when searching for and selecting digital content. If the pupils choose to locate their 3D models geographically, they should avoid sharing private information. The pupils should think about copyright when adding content to their model or publishing images or videos of their model. |

Year 6

|  |  |
| --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills |
| **Computer Science**   * **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.** * **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.** | **We are project managers**   * I can make a list of the main steps of my project that need to be completed. * I can make a list of the tasks of my project that need to be completed. * I can make a list of the things I will need to complete the project. * I can create original content for my app. * I can judge how well the work on my app is going. * I can spot and list the different parts of my app that will need to be created. * I can see how the members of my group have different skills and talents. * I can put the tasks of my project in an order that will work well. * I can find content from other places to use in my app. * I can use and credit content I use from other places correctly. * I can work with my group to keep track of how well the project is going. * I can see how to keep working on my skills to make the project a success. * I can see how to improve the planning of the tasks in the project.   **We are app developers**   * I can create and write an algorithm for my app. * I can convert my algorithm into code. * I can keep testing and improving the algorithm to find the ‘bugs’ in my code. * I can think through and work out where mistakes are in my algorithm. * I can use sequence, selection, repetition and variables in my code. * I can think through and work out where mistakes are in my code. * I can listen to and act on other people’s ideas to improve my code. * I can think through and work out how to correct mistakes in my algorithm. * I can use procedures in my code. * I can think through and work out how to correct mistakes in my code. * I can sort and deal with problems and new features for my app in a sensible order. |

|  |  |
| --- | --- |
| **Information Technology**   * **Use search technologies effectively, appreciate how results are selected and ranked.** * **Select, use and combine a variety of software (including internet services) on a range of digital services to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.** | **We are app planners**   * I can see that a smartphone is a computer. * I can find geotagged photos on a map. * I can come up with interesting problems that I could solve with an app. * I can research apps that already exist that may solve my problem. * I can judge how well apps that already exist work. * I can create and present a well-planned presentation for my app. * I can name and describe the inputs and outputs of smartphones. * I can use GPS to find media (e.g. photos) that have been geotagged. * I can show how apps that already exist will solve a problem. * I can explain how search engines order web pages in a search (‘Page Rank’). * I can answer questions about my app well. * I can explain how smartphones connect to the internet through the phone network. * I can explain how GPS works and how it can be used in practice. * I can use different types of media (e.g. video) in my app presentation.   **We are market researchers**   * I can create a survey online. * I can use simple charts to explain what my survey results show. * I can run an interview or a focus group. * I can explain what the information I collect from an interview or focus group shows. * I can present my survey, interview or focus group results. * I can use tables to explain what my survey results show. * I can use an audio recorder or camera to record an interview or focus group. * I can judge the quality of my survey, interview or focus group results. * I can explain what the audio or video I recorded means for my results. * I can follow the rules for carrying out surveys, interviews or focus groups. * I can create questions for my survey that are clear and balanced. * I can use Pivot Table reports to explain what my survey results show. * I can collect information and ideas from different places for my presentation. * I can choose the software for my project and research on my own   **We are interface designers**   * I can sketch my ideas for the design of my app. * I can create screen layouts for my app using a wireframing tool. * I can think about how people will use my app as I design it. * I can see how important it is that everyone should be able to use an app. * I can find media assets (e.g. buttons or backgrounds) for my app. * I can sketch my ideas for a user-friendly design of my app. * I can try to design my app so that anyone should be able to use it. * I can create my own media assets for my app. * I can explain how different parts of my app will work together. * I can create user-friendly screen layouts for my app using a wireframing tool. * I can create an attractive design to suit the way people will use my app. * I can follow examples of good design to make sure anyone can use my app. * I can find and credit media assets I use from other places correctly. |
|  | | * I can explain how different parts of my app will work together. * I can create user-friendly screen layouts for my app using a wireframing tool. * I can create an attractive design to suit the way people will use my app. * I can follow examples of good design to make sure anyone can use my app. * I can find and credit media assets I use from other places correctly.   **We are marketers**   * I can create a marketing flyer which includes images and text. * I can create a website for my app which includes images and text. * I can record my own video or find video and content from elsewhere for my app advert. * I can create a persuasive and well-designed marketing flyer for my app. * I can plan and create a well-designed and user-friendly website for my app. * I can see how important e-safety is and that I am responsible for content I create. * I can edit my own and others’ content for my app advert. * I can choose software that is best suited for making my flyer. * I can choose the best hosting and development platform for my website. * I can follow the rules for creating and presenting content for a website. * I can choose the best software and hardware available to me to create my advert. |

|  |  |  |
| --- | --- | --- |
| Statutory requirements ( National curriculum) | Key Knowledge and Skills | Statutory requirements ( National curriculum) |
| **Digital Literacy**  **Understand the opportunities networks offer for communication and collaboration**   * **Be discerning in evaluating digital content** * **Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact** | **E-safety**  **We are app planners** The pupils consider the capabilities of smartphones and tablet computers, and how these can be used purposefully. They become aware of some of the capabilities of these devices, including how they can be used to record and share location information; they consider some of the implications of this. They use search engines safely and effectively. The pupils could make use of their own tablets or smartphones in school, considering how they can do this safely and to good effect.  **We are project managers** The pupils use online tools safely and effectively, considering how they can contribute positively to a shared project. Again, they use search engines safely and effectively. They may also make use of online content, respecting any copyright conditions.  **We are market researchers** The pupils show regard for the ethical and legal frameworks around conducting interviews and online surveys, such as the need to preserve anonymity and/or confidentiality. In conducting their research, the pupils need to act safely and responsibly, as well as showing respect for those participating in the research.  **We are interface designers** The pupils need to think carefully about copyright in relation to both sourcing and creating their own digital content and user interface components for their apps.  **We are app developers** Pupils using their own or the school’s tablets or smartphones for this unit need to consider how to do so safely and purposefully. Children participating in online communities for either of the development platforms here need to do so in a safe, responsible and respectful manner. The pupils should also think carefully about any safety implications of the apps they develop.  **We are marketers** In marketing their app, the pupils should consider the legal and ethical frameworks around advertising across different media. They should also think about the need to protect personal information about themselves and other members of their group when marketing their app. In creating websites for their apps, the pupils need to consider the e-safety implications for the site’s users as well as themselves. | |