Year 1	Topic Title: E-Safety	Key Vocabulary
National Curriculum Objectives: 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.	• **<u>Know when and why to take breaks from device time.</u>** ▪ Emphasise that sometimes what we're doing online is so fun that it's easy to lose track of time. That's why it's important to stop and notice when people and other fun things are happening in real life around us. ▪ Define a 'device'. Explain that whilst using devices it is important to follow certain rules to make sure we're making healthy and responsible choices. Use 'Balance is important' song. • **<u>Consider the feelings of people around them, even when engaged in fun online activities.</u>** ▪ Use the following Key Questions- ▪ *Why should you take a break from a device when a friend says hi?*- It's important to pause and acknowledge the people around you. The people in real-life might want to tell you something important, ask a question or play with you. ▪ *Why should you invite your friend to play when they are all alone?*- Just like in real-life it is important not to exclude anyone…this is the same on a device. ▪ *Why is it a good idea to turn off your device before going to bed?*- Doctors say that it is best to sleep without devices turned on so that we don't get distracted whilst we are trying to sleep. ▪ *Why should you ask permission before taking someone's phone?*- A phone or tablet is someone's personal property, you should always ask permission before taking someone else's device. This includes your parents/carers. Treat their devices with respect! • **<u>Learn why it's important to be aware and respectful of people while using devices</u>**. ▪ Why is it important to pause from our devices for the people around you? • **<u>Learn the 'Pause! Breathe! Finish up!' routine as a self-regulation strategy for transitioning from technology to face-to-face interactions.</u>** ▪ You can do this as a chant with actions: PAUSE! (Hold your hands out away from your body) BREATHE! (Sweep your hands up to your chest and lower them) FINISH UP! (wave with both hands) ▪ Discuss potential scenarios in which this routine may need to be used. • **<u>Discover that the internet can be used to visit faraway places and learn new things.</u>** ▪ How do you stay safe when you visit new places? ▪ Explain that visiting new places on the internet is just like visiting new places in the real-world and we must still keep ourselves safe. • **<u>Compare how staying safe online is similar to staying safe in the real-world.</u>** ▪ Invite the children to discuss how they can do this? *Ask a trusted adult, only talk to people you know, stick to places/websites/apps that make you feel good and are right for you.* • **<u>Explain rules for travelling safely on the internet.</u>** ▪ Define a website as a place you can visit on the internet. Children can visit zoos/museums etc online even when they are miles away from their homes.	Balance Device Frustrated Pause Online Website App

	▪ Children will follow rules as they use the websites such as 'only talking to people they know' and 'sticking to websites/pages that are right for them'	
	Previous Learning Experiences:	
	EYFS- People who help us	
Possible Community Links/trips	**Future Learning Experiences:**	
	Future E-Safety lessons throughout the school from Years 2-6	

Year 1	Topic Title: Getting Started	Key Vocabulary
National Curriculum Objectives: 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	• **<u>To log into a computer and access a website.</u>** ▪ Ask the children to sketch and label a picture of a computer. Let the children suggest key words such as, mouse, keyboard etc. Write these up for them. ▪ When children have finished their drawings, place them to one side before explaining that they need to sort their objects and explain why they are choosing a particular way. ▪ Ask key questions such as what similarities can you spot between the objects? For example, things you would find in the kitchen, things you need to plug in, things that you used to help you eat. Where else could you find computers and how different do they look? What do you think a computer looks like now? Would you like to make any changes or draw anything different to your existing drawing? ▪ Ask the children what items they can think of that are password protected (phones, computers, tablets, etc). Ask why we might need password protection on our computers (to keep things safe or to stop someone else from accessing our information). Explain that we also use accounts to help organise what information people have access to and to make it easy to save work to a secure space. ▪ Explain that at school we all have accounts that we can log into so that we can keep our work separate from everyone else's. If you are using a 'class' account, for example, 'Year 1F', explain that they will have personal accounts when they are older. Demonstrate how to log in. ▪ You may find that some of the children are unfamiliar with both the mouse and keyboard, so take some time to explain how to use them ▪ S**<u>ketchpad -</u>**Sketchpad is a simple, free, online art tool. Start by showing the children how to navigate to it, by one of these two methods: Setting up a desktop shortcut to Link: "Sketchpad", and adding the shortcut as a favourite in their web browsers. Finding Link: "Sketchpad" by searching for Sketchpad. For the rest of the lesson, the children will explore Sketchpad. Show the children how to select different brushes within the software and see if they can figure out what each one does. For now, ensure pupils stay on the 'Tools' tab in the top left of the site. ▪ **<u>Microsoft Paint –</u>** MS Paint will work just as well for the same activities so that the children can explore. ▪ encourage the children to test out each tool, thinking about the following skills: Predict – thinking about what they're going to do first, Explore – trying it out, Explain – seeing if they were right. These activities will complete a cycle of: predict, test, review. This is an important building block for problem solving in computing. Allow children to explore Sketchpad/MS Word and see what they can create. ▪ Key questions - What items can you think of that are password protected? (Phones, computers, tablets, etc.) Why might we need passwords on our computers? (To keep things safe or to stop someone else from accessing our information.) Can you choose different colours for your shapes? • **<u>To develop mouse skills</u>.** ▪ This lesson uses "Sketchpad", a free online drawing software that can be accessed via internet browsers such as Chrome or Safari. ▪ Children will be looking at a digital photograph and digital art. What is the difference? (Photograph – created on a camera. Art – Created on a computer) ▪ Children will create their own digital artwork on the computer using a variety of different techniques. Use Sketchpad or MS Paint. ▪ Allow the children to walk around the room and look at each other's artwork. If a child has done something differently, you could ask them to explain to the rest of the class what they have done. You may want to save and print pupils' work for display.	Log in • Login • Log off • Computer • Mouse • Mouse pointer • Click • Keyboard • Screen • Password • Account • Software • Sketchpad • Clipart • Tools • Brushes • Eraser • Predict • Explore • Explain

- **<u>To use mouse skills to draw and manipulate shapes.</u>**
  - In this part of the lesson, the children identify the key characteristics of shapes, without worrying about specifics such as size or colour. This is fundamentally a maths activity, but we are also looking at the computational thinking skills of abstraction. Ask children to name a variety of 2D shapes.
  - The children will use either sketch pad or Microsoft paint to create artwork using various different shapes. You may wish to ask questions such as what are the key features of your shapes? How many sides does it have? In order to keep the mathematical element of the lesson underpinning the computational thinking.

- **<u>To use a range of tools to create desired effects.</u>**
  - The children will test their mouse skills with the flash based game 'let's go learn click the bubbles'. The children have to move the cursor to click on bubbles as they appear. Show the children how to play and ask the children to log into their computers to see who can get a high score. You may wish to ask a key question here how easily can use the mouse to click?
  - The main aim of this session is that the children will draw scenes from a story. You may wish to choose a variety of nursery rhymes or children's fairy tales in which they have to use sketch pad or Microsoft paint to create a drawing that goes along with a story.
  - Show the children how to change the brushes change the textures and change the colours etc on sketch pad or Microsoft Word so that the children can really take their drawing themselves and create their own individual pictures. Ask questions such as; what type of paint brush will you use? Why have you chosen to do that?
- **<u>To understand how to layer shapes to create an image.</u>**
  - This introduces the key computing skills of decomposition and abstraction. The children will decompose the face into its component parts and abstract the important features that make up a face. Ask the children to choose a partner and to face them, what can the children spot on their partner that everyone else has on their face? What is different about their partners face? It could be their eye colour, their hair colour, skin colour etc. Ask the children to write down or draw common and distinguishing features of their face. As a class, discuss what the children found out about their faces. What is the same and what is different for each person? Make a record of the children's suggestions for the key features of everyone's face.
  - The children will now draw self portraits using sketch pad. handout mirrors or a previously taken photograph of the child and ask the children to choose tool to create their self portrait. Ask their children to suggest which tools in sketch band could be used to draw each facial feature for example they may use to use the shape tool to draw the shape of their faces etc.
  - Once you have completed this, print children's artwork to use as a display.

Previous Learning Experiences:

EYFS- Getting to know a computer

Possible Community Links/trips	**Future Learning Experiences:**
	Future computing experiences and lessons throughout the school from Years 2-6.

Year 1	Topic Title: Programming - BeeBot	Key Vocabulary
National Curriculum Objectives: Use logical reasoning to predict the behaviour of simple programs. Create and debug simple programs. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute by following precise and unambiguous instructions	**Getting to know a BeeBot - To explore a new device** • Hand out the Bee-Bots. Tell the children that they have five minutes to get them working. Do tell them where the 'on'/'off' switch is! ▪ Give the children one rule to follow: 'No pushing them along like a toy car'. Pushing a Bee-Bot forces the wheels to turn whilst the motor is trying to hold them still, which breaks the Bee-Bot. ▪ After five minutes, ask the children to share what they found out. Ask the Key questions. **Key Questions** ▪ What can the Bee-Bot do? ▪ How did you make that happen? ▪ What did your Bee-Bot do? ▪ Can it do any other things? ▪ What happens when I press this button? ▪ What does the 'x' button do? ▪ Did anyone's Bee-Bot not follow instructions? ▪ Draw the children's attention to the function of the clear button 'x'. Although it is important, there is no visible response when the 'x' button is pressed. ▪ Using the Activity: Bee-Bot challenge cards, explain each of the three challenges: Challenge one: Can you build a bridge for the Bee-Bot out of blocks and make the Bee-Bot drive through? Challenge two: Can you make the Bee-Bot turn all the way around in a circle without moving off the starting spot? Challenge three: Can you work together to get the Bee-Bot from the start position to as close to the wall as you can without crashing? **Key questions** ▪ Can you build a bridge for the Bee-Bot out of blocks and then make it drive through? ▪ Can you make the Bee-Bot turn all the way around in a circle without moving off the starting spot? ▪ Can you work together to get the Bee-Bot from the start position to as close to the wall as you can without crashing **Making a BeeBot video - To create a demonstration video** ▪ Ask the children what the most important things are to know about a Bee-Bot. How will the children: Explain what a Bee-Bot is and how to turn it on/off. Show how to make the Bee-Bot move forward using 'Forward' and 'Go' buttons. Explain how to make the Bee-Bot move backwards and how to clear the instructions. Show how to make the Bee-Bot turn left or right. Demonstrate how to pause the Bee-Bot in the middle of a set of instructions. ▪ Two children are behind the camera recording and watching. Two children are on-screen. The children on-screen should take it in turns to discuss and demonstrate the various buttons and subsequent movements of the Bee-Bot. Children should keep rotating roles so that everyone gets a turn on each side of the camera. Depending on your class size, you may need to adjust the number of children to each camera. **Key questions** ▪ What are the most important things to know about a Bee-Bot? ▪ Have you explained what button 'x' does? **Precise instructions - To plan and follow a set of instructions precisely**	Algorithm Bee-Bot Computing code Computer program Explain Explore Instructions Predict Tinker Video

	▪ Show the children the Activity: Bee-Bot mask and controller. Explain that the children will be set a task to show how well they can follow instructions. Ask who the children think will be better at following instructions, a Bee-Bot, or the children? ▪ Explain that this is a rotational activity. Each person in the group has a role: ▪ Controller: who gives the instruction and presses the corresponding button on the cardboard controller. ▪ Bee-Bot: who listens to and watches the 'Controller' press the button on the cardboard controller and then follows the instructions accordingly. ▪ Judge: who listens to the instructions being given and watches what the 'Controller' does to make sure they are correct. ▪ Place cones at random all over the large space you are using. These are for the children to direct their partner to, without bumping into another group or going in the wrong direction. **Key question** ▪ Who would like to be a human Bee-Bot and follow the instructions that we have come up with? ▪ Start with a quick recap of typing on a BeeBots. Explain that the children will be set a task to show how well they can follow instructions. Ask who the children think will be better at following instructions, a Bee-Bot, or the children? ▪ Tell the 'Controllers' that they should only give the human 'Bee-Bot' a single directional arrow at a time. For example, they could press on the cardboard: 'X' (clear) > 'Forward' (direction) > 'Go'. This gets the children used to pressing 'clear' every time and then 'Go' to run their 'code'. Make sure that the children are swapping roles. Stop the children when they have assigned one direction using 'X' and 'Go'. ▪ To introduce the next challenge, ask for a volunteer to be your 'Bee-Bot'. ▪ With a specific cone as a destination, demonstrate pressing two to three directions before setting your volunteer 'Bee-Bot' off. Discuss: What cone did you aim for? Did your 'Bee-Bot' reach it? ▪ Children often think that turning like a 'Bee-Bot' is the same as taking a step, but a Bee-Bot rotates on the spot- did your 'Bee-Bot' turn on the spot instead of moving in the direction of the turn? If your volunteer 'Bee-Bot' did not follow your instructions correctly, take their place and model the correct moves. ▪ Set the children the task of moving the 'Bee-Bots' to the chosen cones. The cones should be quite near as the 'Controller' should not enter more than three direction instructions. The 'Controller' should secretly tell the 'Judge' which cone they are aiming for before they give the 'Bee-Bot' instructions by 'pushing' buttons on the cardboard controller and saying out loud what the instructions are. **Key questions** ▪ Which cone did you have in mind? ▪ Did the 'Bee-Bot' reach it? ▪ Did the 'Bee-Bot' turn on the spot and not move in the direction of the turn? ▪ Did you remember to give clear instructions? ▪ Did you wait until you were told to 'Go'? ▪ Did you direct your partner to where you were meant to? <u>BeeBot World - To program a device</u> ▪ Start the session by allowing the children to continue to programming skills of the BeeBot. ▪ Introducing the word 'program', the children will make simple 'programs' that involve one or more steps to navigate their Bee-Bot around their mats from picture to picture. ▪ Sit in a circle with a Bee-Bot world mat in the centre. Demonstrate sentences that you want the children to use. For example, "I am going to program the Bee-Bot to reach the frog by pressing ['x', 'x', 'x']".	

	▪ Ask the children which buttons they need to press to make this happen. ▪ Bee-Bot exploration: Working in pairs, the children take it in turns to program the Bee-Bot to navigate the mat to their intended destination. For example: Partner A says, "I'm going to program the Bee-Bot to the [x]." Partner A then tries to get the Bee-Bot to the declared destination. Emphasise the need to declare the destination first. The children should never touch the Bee-Bot. The children should be able to give complex instructions including complex moves such as turning. Use mini-plenaries to reiterate children's use of the word 'program' throughout the activity. **Key questions** ▪ How many buttons do you need to press to get there? ▪ Do you think you need to turn? ▪ Where will that code get you to? **Three Little Pigs - To create a program** ▪ Discuss the story of the 'Three Little Pigs'. **Key questions** ▪ Who knows the story of the 'Three little pigs'? ▪ What happens in the story? ▪ Explain that Bee-Bots like stories and they are going to help us to retell the story of the 'Three Little Pigs'. ▪ Get the children into pairs, give each pair a Bee-Bot and a copy of the Activity: Three Little Pigs Bee-Bot mat. ▪ Do a few warm-up exercises, for example: ▪ 'Can Partner One get the Bee-Bot to the wolf?' ▪ 'Can Partner Two get Bee-Bot to the blowing picture?' ▪ Model fixing mistakes and learning from them, rather than worrying about them. ▪ Explain that you are now going to read the story of the 'Three Little Pigs'. Instruct the children that when one of the pictures from the Activity: Three Little Pigs Bee-Bot mat is mentioned in the story, one child in each pair should program their Bee-Bot to move to that character (from the Bee-Bot's last position). ▪ Partner one: moves the Bee-Bot to the red spaces in the story. ▪ Partner two: moves the Bee-Bot to the blue spaces in the story. ▪ Read through the story, using the prompts as necessary. Pause reading while the children program the Bee-Bots. Encourage co-operation but emphasise the rule: 'no lifting the Bee-Bot!'. Encourage the children to think carefully about completing the challenge, by inputting more than one instruction at a time.	
	Previous Learning Experiences:	
	EYFS – Previous Bee-Bot programming topic in Summer 1	
Possible Community Links/trips	**Future Learning Experiences:**	
	Future computing experiences and lessons throughout the school from Years 2-6.	

Year 1	Topic Title: Introduction to Data	Key Vocabulary
National Curriculum Objectives: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school.	• **Zoo Data - To represent data in different ways** ▪ Tell the children that you will be looking at data across this topic, do not tell them what that means. Ask them to try to explain this in the very last lesson of the topic. **Key questions** ▪ What do you think the word data means? ▪ Show children the Zoo map, showing different numbers of animals in each enclosure. Explain that you want to remember how many of each animal there are so that you could tell someone at home. You are not allowed to take the Zoo map with you. ▪ Tell children to use lolly sticks, cubes, paper, colouring pencils or other objects they find, to represent the animals and show how many of each animal there are at the zoo. Encourage the children to find easy ways of showing which animals there are more, or fewer of. Rather than having a pile of lolly sticks or cubes, they may prefer to line them up or put them in piles. ▪ Halfway through, ask the children to try representing the information in a different way. If the children have used objects, then encourage them to use drawings (either pictures of the animals or something more abstract, e.g. lines, circles, dots, tally chart). And vice versa, if the children have used drawings, then encourage them to use objects. If someone needs a challenge, task them with representing the information using numbers. ▪ Show text showing how many of each animal there are in full sentences. Ask what they think about this. Is it easy to quickly compare the number of each animal? No, you need to read the text and compare the numbers in your head, visually represented data is much quicker for us to interpret. **Key questions** ▪ What do you think about this? ▪ Is it easy to quickly compare the number of each animal? **Picture Data - To use technology to represent data in different ways.** ▪ Ask children to remind you of how they represented the number of animals at the zoo in the previous lesson. Go through how to show this information in a table, getting the pupils to remind you how many of each animal they found. Keep this displayed throughout the lesson for children to refer back to. ▪ Explain that they will show this information in interesting ways, using the computer. They start by creating a pictogram. Get them to think of what they would need to make this. **Key questions** ▪ How did we represent the number of animals at the zoo in the last lesson? ▪ What is a pictogram? ▪ What do you think we need to do to make a pictogram? **Pictograms** ▪ Show children how to navigate to 'J2E's JIT5' by: setting up a desktop shortcut, adding it as a favourite in their web browsers or finding it by searching for JIT5. ▪ Then, demonstrate clicking on the red tab in the top right called 'pictogram'. At each stage of the lesson, get children to predict what will happen if they click a certain button, encouraging them to be brave and have a go. They can then share what they have learned with the rest of the class. Once everyone is on the pictogram page, they click on the arrow buttons next to the picture of a lion to scroll through the different animal pictures available.	Branching database Categories Chart Computer Data Information Label Pictogram Record Sort Table Text

	▪ When they find an animal that was seen at the zoo (lion, zebra, elephant, flamingo, monkey) they either click and drag it to one of the rectangular boxes at the bottom or click the animal and then click the box they want it to go to. They should give each animal a label by typing this in at the bottom. ▪ Once they have added all of the animals to the label boxes, they can then click the + to add these to the pictogram. For example, if there are three lions, they should click the + sign three times. They continue this process for all of the animals. **Charts** ▪ Next, get children to click on the orange 'chart' tab: ▪ They then fill out the table with the values. Everyone can then experiment by clicking or unclicking the different representations of data. **Key questions** ▪ Why did adding lots of one animal made the size of the pictures change? ▪ Why did this resize all of the other animal images in their pictogram? **Minibeast hunt - To collect and record data.** ▪ Explain to children that they are going to go on a hunt for minibeasts. Get them to consider the kind of insects or small creatures they might find. Tell children that you want them to find out which minibeast is most commonly found on the school grounds. Discuss how they would find this out and what they could do to record their findings as they go along so that, as a class, we can bring all the information together at the end. ▪ Explain that they need to draw a small picture or symbol of any minibeasts they find and then create a tally next to it to show how many of them they find. Go over the concept of a tally if necessary, referring to what they learned in Lesson 1. **Key questions** ▪ What kind of insects or small creatures (minibeasts) might we find? ▪ How would we find this out? ▪ How can we record the information we find? ▪ What is a tally? ▪ When finished, they come back to the classroom to represent the data they have collected. **Represent Data - To sort data** ▪ Get children onto the 'J2E's JIT5' in the same way as the previous lesson, explaining that they are going to use their skills from Lesson 2 to represent the data they have just collected. If they worked in groups of three, they should all work together to do this, but if they worked in a group of four, they should split into two pairs to make sure they are involved in the process. ▪ Explain that they are going to select the five minibeasts they found the most of and represent the data in different ways. If they choose the 'chart' tab, they can put the information in a table – naming each of the minibeasts they encountered – but then show the data in multiple different ways. ▪ If they select the 'pictogram' tab, they will need to find and select appropriate images or draw those that are not available. As mentioned earlier, most of the relevant images are in the minibeasts category, but two are found in the animals' category. ▪ Explain to any pupils that ask that all of these creatures could be in both the minibeasts and animals' categories, which could lead to a discussion about groups within the umbrella term of animals. **Key questions** ▪ Why do you think it is good way to carry out data collection? ▪ What is the best way to approach representing the data? ▪ Which are the five most common minibeast you have found? ▪ How many were there of each?	

	Animal guess who - To design an invention to gather data. ▪ Ask children to think about the different animals that they know and list them on the board. List terms they should be familiar with in the Animals slides – fish, amphibians, reptiles, birds, mammals, invertebrates (no backbones), carnivore, herbivore, omnivore. How else could they describe these creatures? Number of legs, fins, if they have a beak, snout, etc. **Animal Guess Who** ▪ Go to the branching database page on 'J2E's JIT5', select the animals' category, then click on at least 10 animals so that they appear in the box on the right. Choose animals from different groups (e.g. mammals, reptiles, etc). ▪ Tell pupils that you are thinking of an animal, and they need to ask you questions which you can answer yes or no to, in order to work out your animal. **Key questions** ▪ Can you think of the different animals we know about? ▪ Let's list them on the board. ▪ How can we group these animals? ▪ What similarities and differences do they have? ▪ What do they eat? ▪ How else could they describe these creatures? ▪ As a class discuss the most effective questions from the Animal Guess Who, i.e. which ones narrowed down the selection of data the most. ▪ Explain that they are going to make their own version of the 'Guess Who' game, using JIT5's branching database. Show children the 'sort' button at the bottom right. It will ask you to type a question which will split this group of animals (get them to consider the questions from the 'Animal Guess Who'). Encourage them to use words like mammal, fish, herbivore, carnivore, etc. Once you have typed your question, click and drag the animals into either the 'thumbs up for yes', or 'thumbs down for no' groups then click 'done'. ▪ Explain that they will repeat this process until all of their animals are sorted. Set pupils off on this task, recommending that they start with a maximum of six animals. They should work in pairs to create questions to sort the animals then practise their mouse skills to click and drag the correct animals into either the yes or no boxes. ▪ Once they have finished, the program asks if they want to play. They can test their game by clicking 'play' and choosing one of the animals from the left hand side and remembering that animal. They then need to test if their branching database can accurately figure out the animal, they chose by answering the questions. ▪ If they notice a question is not right, they can click on the edit pencil icon in the left of each box to change it. **Key questions** ▪ Can you sort the data using the fewest number of questions? ▪ Carnivore? ▪ Four legs? ▪ Does it have a beak? Has it got a black stripe on it? • **Inventions** ▪ Remind pupils of their minibeast hunts (Lesson 3), getting them to recap how they collected the data. Explain that computers can be very useful for collecting and recording data for us, e.g. some car parks take photos of car number plates and record how long they are parked for so they know how much money to charge. ▪ Explain that just like we have our five senses to understand what is going on around us, computers can understand information in different forms through an input device, which acts like our eyes, nose and mouth, etc, and then the computer does the job of our brain in	

	understanding what that information means. For example, when you see your friend, your eyes see them and then your brain recognises them and gives information about them, eg: their name is Jenny, they like playing football, etc. ▪ Computerised devices can be designed and made to understand many different forms of input, eg: movement, pressure, level of sound, level of light, image recognition, etc. ▪ Ask pupils how they would design a computerised invention that could have recorded the data they collected from the minibeast hunt. Could it take photos and identify the creature and keep track of the number? **Key questions** ▪ What did we look at last lesson? ▪ What did we do with the data? ▪ How would you design a computerised invention that could have recorded the data you collected from the minibeast hunt? ▪ Could it take photos and identify the creature and keep track of the number? ▪ What would it do if it did not recognise a minibeast? ▪ Explain to pupils that they are going to be inventors! They can be very creative with their design (i.e. it doesn't have to be something that they could actually make); however, it does have to behave like a computer. In pairs, pupils come up with ideas for an invention, which would collect data in order to help them to answer a question of their choosing, e.g. When is the most popular time to visit the park? What is the most popular toy in the shop? What is the loudest part of the school? What time of the day is the school hall the warmest? ▪ Once they have come up with their idea, they go to 'Sketchpad'. Tell them that you want them to draw their inventions, adding labels and information to explain: What their computerised machine would need to count or measure, roughly how long it would need to gather data, what type of input it would need (movement, pressure, level of sound, level of light, image recognition) ▪ Demonstrate how to click the 'Text' button to type labels for their computerised invention and challenge them to experiment with changing the colour, size and font of the text. **Key questions** ▪ When is the most popular time to visit the park? ▪ What is the most popular toy in the shop? ▪ What is the loudest part of the school? ▪ What time of the day is the school hall the warmest?	
	Previous Learning Experiences:	
Possible Community Links/trips	**Future Learning Experiences:**	
	Future computing experiences and lessons throughout the school from Years 2-6.	

Year 1	Topic Title: Digital Imagery	Key Vocabulary
National Curriculum Objectives: Use logical reasoning to predict the behaviour of simple programs. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of Information technology beyond school. Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	• **<u>To understand and create a sequence of pictures.</u>** ▪ Introduce the children to the idea of telling a story without words. How can the children understand what is happening without the text? Read a picture book or other pictorial story together. Talk about what is happening in each part. This could be the example included in photograph story or another popular story that you want to share. ▪ There is an opportunity here to use cross curricular links with English to encourage the children to identify what is going on in each picture, using appropriate vocabulary. The children predict what might happen next, to develop their comprehension skills. Ask the children to discuss why it is important that these pictures are in the correct order. If the children changed order, would it change their story? Make clear links between sequencing and computational thinking. Key questions may include: how can they tell what is happening when there is little or no text? What is going on in each picture? Can you predict what will happen next? Why it is important that these pictures are in the right order? If we change the order, would it change the story? ▪ The children should be confident stories can be made from pictures alone. The children also need to understand how pictorial stories work. ▪ Children will plan their stories and finish the session by explaining them to the group. • **<u>To take clear photos</u>**. ▪ Show the children the digital cameras or tablets. Explained that before we learn how to use cameras, we need to look at what a good photo looks like. Can the children spot good photo? Discuss things such as lighting, how much space the characters Phil, whether they are blurred. Use this to help them decide what could affect their resulting photograph and therefore what they can do to ensure that their pictures are clear. ▪ Introduce the children to the device that they are going to be using show the children how to turn it on, use the screen to focus on what they are capturing and how to take a photo. It is possible for all the children in the group to take at least three photos they need within the time. Although they are helping each other out, the children should create their own story. ▪ To end the session, choose one of the devices and connected to the computer or projector to show some of the photos the children have taken. • **<u>To edit photos</u>**. ▪ Show children examples of edited photos. Ask them what happened to the photo? They do not need to name the effect accurately, just describe what is different. For example they might say that one has more sparkles. The point is for the children to recognise that the images changed. ▪ Explain to children that they are going to explore editing the photos that they took in the last lesson. In pairs or groups commas depending on the number of devices available, children will edit one photo together. The point is to understand the different changes they can make to images. ▪ Bring the children back together to share any affects that they particularly liked. Discuss where might be a good time to use that effect and why is exciting or interesting. Does it make the image look older or more vibrant? Does the effect draw attention to the smaller part of the image? • **<u>To search for and import images.</u>** ▪ Children will look at images that have been edited online. Why would you want to add something to a picture that wasn't there before? Think about going into a dangerous situation- do we really want to take one of our toys to volcano? Would it be safe? Use this as a springboard to talk about images online, particularly how although it might seem like they're real common after they have been changed after they have been taken. Look up various examples for the children. Always cheque websites before you	Camera, crop, delete, download, drag and drop, editing software, image, import, photograph, resize, save as, search engine, sequence, smart device , storage space, visual effects.

	show them to children as the content could change on a daily basis. This is also an opportunity to talk to the children about what they should do if they see images online they're worried about or don't like. ▪ Explain to the children that they're going to be editing their photos. Taking photographs is one way to get a picture on a computer. Ask the children does anyone know any other ways we can find images on a computer? Talk about what this means. This is an opportunity to discuss that were created by others can be shared online for others to view. This does not mean that a viewing person could simply just save a copy of the work and pass it off as their own. The work is owned by the creator and in most cases comment the piece of work is copyrighted. Discuss what the term Copyright means. ▪ The iPads will already have preloaded editing photograph apps on them. Once the children have decided on the pictures they wish to edit and things they wish to add to their pictures they can open the photo editing apps and begin to create their edited picture. ▪ At the end of the session, pick some children's work to show. Talk about why they decided to edit the pictures in this way. • **<u>To create a photo collage</u>**. ▪ Remind the children of the photo Storey that we looked at the beginning of the unit. Look through it again to remind them. Explains the children that they may like or dislike the photos from photo Storey and that this is a natural feeling tab about anything that they might see online. Develop discussion to include a range of different online content that can evoke different emotions. Ask the children to question whether the concept they see Israel, break believe or even a joke. Again, stressed that our natural instincts are to form opinions and what we see online. ▪ Explain to the children they are now going to make a collage from the photographs they have taken. Using the app pic collage the children will resize shape altar photographs they have taken to create their collage. ▪ Tell the children that the classroom is now Gallery, they're going to walk around and look at the photos storeys which their peers have created. There not to touch any of the iPads or laptops and as they walk around they should look for those children have created clear storeys, where you can tell exactly what is happening from their photos. At the end getting children to share whose work they were impressed with and why.	
	Previous Learning Experiences:	
	EYFS- looking at cameras in tuff trays etc. Using cameras/iPad at home.	
Possible Community Links/trips	**Future Learning Experiences:**	
	Future computing experiences and lessons throughout the school from Years 2-6.	

Year 1	Topic Title: Rocket to the Moon	Key Vocabulary
National Curriculum Objectives: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	• **Rocket Materials - To recognise that digital content can be represented in many forms** Start by watching a 'Space Rocket' video called 'Cartoons for Kids – Big Construction: Space Rocket' on VideoLink, showing how a real rocket is made and launched into space. Explain that you are going to make a list of the things that the rocket designers might need to make a rocket. Show children a plastic bottle, a glass bottle, a piece of firm card, a piece of wood and a lump of rock, then ask them the 'Key Questions'. **Key questions** ▪ What materials do you think a real rocket is made from? ▪ Why is metal a good material to use? ▪ How much of this material would be needed? ▪ How are the different parts of the rocket held together? ▪ What could happen if the rocket designers forget something? ▪ Discuss appropriate materials, then as a class look at the webpage for 'BBC Bitesize's Which material do we use?' ▪ Explain that later in the topic they are going to work in pairs to make a model rocket using junk modelling materials, which will either be thrown across the playground or launched using 'The Royal Institution – How to make fizzy bottle rockets' video. But first, they need to think about what items and materials they will need to use to create their rockets. For support, watch this 'BBC Cbeebies' Make a rocket with Justin' video, which shows a simple method for the construction of a rocket and the materials that they might want to use. ▪ They now need to create a list of the equipment and materials they will need to make their rocket but stress the importance of not losing their lists once they have written them and explain that this is where a computer is useful. ▪ Ask how they think a computer could be used to make the list and discuss the following ideas: drawing pictures of the objects and materials. Typing into a word processing program/spreadsheet. Using the internet to find pictures which they could copy and paste into a document. Recording an audio-memo style list. **Materials list activity** ▪ As a class, discuss the materials that they might want to use to create a rocket (refer to the 'BBC Cbeebies' Make a rocket with Justin' video if needed). Then, using computers, in groups of two or three, children create a list of equipment that they will need. You could use this as an opportunity for assessment or to familiarise them with software. **Key questions** ▪ How could we use a computer to make the list we need? ▪ Which materials might we want to use to create a rocket? • **Rocket design - To design a rocket** ▪ In this lesson, the children will be designing their rockets. They will need to use the list of materials that they created in the previous lesson, so ask them to retrieve their files from wherever they saved them. ▪ Model how to open 'Sketchpad' and remind children how to use the different tools. Model how to add text to an image, so that they can label the different parts of their rocket. **Key questions** ▪ What did we learn about in the last lesson? ▪ What can you remember about the software called 'Sketchpad'?	Computer Computer program Create Data Digital content e-Document Folder List Save Sequence Share Spreadsheet

	▪ Ask pupils to work in the same groups as the previous lesson to create their design for their rockets. If they have not already done so, ask them to open up their list of materials. Recap why it was a good idea to save these on the computer – so that they would be easy to find and would not get lost. ▪ As a class, discuss and record the components that they will need to include in their rocket designs: a nose cone, fins and a main body or structure. ▪ Set children off on their challenge of drawing their rockets using 'Sketchpad', as modelled at the start of the lesson. They should continue to discuss ideas with their group throughout the activity and annotate their design with the materials they will use. ▪ Encourage them to consider the following questions, making sure that each member of the group has something to be doing or thinking about; what materials will each component be made out of?, where will we find these materials?, what do we want our rocket to the moon to do?, what would we do if we went to the moon?, what would we like to find out about the moon? **Key questions** ▪ What components we will need to include in our rocket designs? ▪ What materials will each component be made out of? ▪ Where will we find these materials? ▪ What do we want our rocket to the moon to do? ▪ What would we do if we went to the moon? ▪ What would we like to find out about the moon? • **Rocket building instructions - To sequence a set of instructions** ▪ Show children the story of 'Moonshot' by Brian Floca. Think about what the astronauts did first and where the story ended. Ask children why it's important that stories are in the right order. What would have happened if the astronaut put on their boots before their spacesuits? **Key questions** ▪ Why is it important that stories are in the right order? ▪ What would have happened if the astronaut put on their boots before their spacesuits? ▪ Hand out the activity 'Steps to making a rocket'. Ask pupils to work in groups to put the steps into the correct order. Once they have done this, discuss what they found and ask them how they knew the correct order. What would happen if the fins were stuck on before they had been decorated? What would happen if the nose cone was added before it had even been cut out? ▪ Ask children what they would do if they were a rocket-building robot and had been asked to add the nose cone before cutting the shape out. Discuss how sometimes they would just do the wrong thing but sometimes they would show an error message (say "Error, does not compute!") because they can't carry out the instruction. ▪ Finally, ask pupils if they noticed anything that was missing. Explain that there was no picture showing the fins being made. ▪ Hand out a square of paper – the same size as the rest of the images – so that children can draw their version of what this should look like and add it to the correct place in the sequence. ▪ They then stick all the images down, in the correct order. They will need this as they will be acting like rocket-building robots themselves, following the instructions. ▪ To really challenge pupils, get them to consider what they would program the rocket to do to help them find out more about the moon, e.g. take photos, measure the temperature, test for water, record the sound, drop two objects at the same time ('NASA –	

	Apollo 15 Hammer-Feather Drop' video). They could also think about the set of instructions they would need to give the rocket to be able to carry these out. **Key questions** ▪ What have you found? ▪ How did you know the correct order? ▪ What would happen if the fins were stuck on before they had been decorated? ▪ What would happen if the nose cone was added before it had even been cut out? ▪ What would you do if you were a rocket-building robot and had been asked to add the nose cone before cutting the shape out? ▪ Had you noticed anything that was missing? • **Making a rocket - To build a rocket** ▪ Explain to pupils that they are going to build their rockets. Ask them to review their equipment lists from Lesson 1, their designs from Lesson 2 and their instructions from Lesson 3. ▪ Model how to log in and access the files that they have saved for their equipment lists and designs. Give pupils time to look at these as a group and discuss what they need to collect and what they will do first to build their rocket. **Key questions** ▪ What do you need to collect to make your rockets? ▪ What will you need to do first to build your rocket? ▪ Pupils work through their instructions one at a time to complete their rockets, making sure that they use the materials from their lists and follow the design exactly. Reiterate the point that although we could change our minds during the creation process, because they are acting like computers for this activity, they have to follow the list of materials and instructions precisely. If any group needs to deviate from their instructions because they realise something will not actually work, explain that this is called 'debugging' and they will need to change their instructions/materials. ▪ Once all groups have finished their rockets, get them to prepare the space around them to take a photo. Encourage them to discuss what they like about their rocket and what they would improve. **Key questions** ▪ What you like about your rocket? ▪ What aspects of you rocket would you improve upon? Why? • **Rocket launching - To add data to a table or a spreadsheet** ▪ Explain that they are going to be launching their rockets (either by hand or launched, using the idea behind 'The Royal Institution's How to make fizzy bottle rockets' video). Ask them to discuss how they might gather this data. ▪ Key question ▪ What type of information (data) might we able to get from launching our rockets? ▪ As a class, go outside with the rockets, something to measure long distances with (ideally a trundle wheel) and pencil and paper – asking them why they might need to take these. Model how to launch an object (possibly a foam javelin or your own bottle rocket if you've made one) and accurately measure the distance travelled.	

	▪ Point out the importance of having a marker for where the rocket was launched and model how to measure a straight line from this point to where it lands. Ensure that the children understand what they are measuring in (cm) and understand that each metre is worth 100cm. ▪ Pupils then launch their rockets; measure the distance they travelled and note the distance down. Each group should launch their rocket at least three times. ▪ Back in the classroom, model how to put the data into a spreadsheet, creating two columns, one for number of attempts and the other for the distance travelled. ▪ Pupils then add their data into a spreadsheet or table.	
	Previous Learning Experiences:	
Possible Community Links/trips	**Future Learning Experiences:**	
	Future computing experiences and lessons throughout the school from Years 2-6.	