Computing overview- Year 6 Teach Computing

Unit title	Vocabulary	Device needed:
1: Communication and collaboration	Communication, protocol, data, address, Internet Protocol (IP) address, Domain Name Server (DNS),	Chrome book

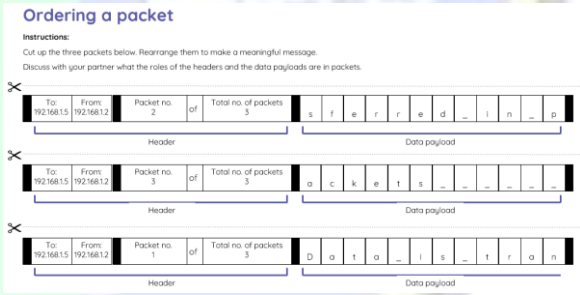
Lesson	Learning objectives	Tasks	Prior Knowledge / Subject knowledge
1 Internet addresses.	To explain the importance of internet addresses: • I can recognise that data is transferred using agreed methods • I can explain that internet devices have addresses • I can describe how computers use addresses to access websites	Task: "How do you use the internet?" Think, pair and share discussion about how they use the internet inside or outside of school. Activity 1: Class discussion on examples of protocols from PPT. If necessary, prompt them to think about rules or conventions they observe in school. Activity 2: Class activity. Give each learner a random number (up to three digits). Say the numbers out loud so the whole class can hear. Ask them to memorise their number and as many others as they can. Move places around the room so they are next to someone else. Ask if anyone can remember the number of the person they are now next to. Ask if they can remember the person's name. Ask learners to reflect on why it is difficult to remember random numbers and relate this to IP addresses: they would also be difficult to remember, but names are much easier. Activity 3: Working in pairs to complete A3 worksheet to find IP addresses of given websites. Class discussion on question after the task.	You may want to read this BBC Bitesize guide or watch the video before the lesson: https://ncce.io/CSN-6-1-L You will need to have an understanding of IP addresses and the role a Domain Name Server (DNS) plays in translating website addresses to IP addresses
2 Data packets	To recognise how data is transferred across the internet • I can identify and explain the main parts of a data packet • I can explain that data is transferred over networks in packets • I can explain that all data transferred over the internet is in packets	Activity 1: Model and explain about data packets via PPT. Cut out the packets on the activity sheet and arrange them into the correct order. Discuss the roles of the header and data payloads in data packets. Activity 2: Groups of three with three 'packet' strips from the 'Packet messages' resource and one page from the 'Numbers for positions' resource. Think of a question that they can write that is no longer than the packets (36 characters maximum, including punctuation, spaces, etc.). Fill out all sections of the strips, using the 'Numbers for positions' resource to complete the 'to' and 'from' sections. Select one learner from each group and ask them to take their sheet from the 'Numbers for positions' resource and their packet strips. Each learner should stand in a space away from the others. See the diagram on slide 10 for reference. The remaining class to spread out across the room. Begin passing the packets between each other in the approximate direction of the address on the packet. The remaining class to spread out across the room. Arrange the learners roughly as illustrated on the slide, to ensure no packets get stuck. Allow the learners to begin passing their packets between each other in the approximate direction of the address on the packet. Activity 3: Class discussion on suggestions as what can be transferred on the internet (other than	You will need to be aware of the concepts associated with sending messages in packets, including the main parts of a data packet: the header (contains the sending and receiving of information) and the data payload (contains the data itself).


Finding IP addresses of websites

Go to www.nslookup.io and look up the IP addresses of the following websites:

Website	IP address or addresses
www.bbc.co.uk	
www.google.com	
www.microsoft.com	
www.number10.gov.uk	
www.youtube.com	
Your school website	

What do you notice about the IP addresses for google.com and youtube.com? Can you explain what you have noticed?


Ordering a packet

Instructions:

Cut up the three packets below. Rearrange them to make a meaningful message.

Discuss with your partner what the roles of the headers and the data payloads are in packets.

To: 192.168.1.5 | From: 192.168.1.2 | Packet no. 2 | of | Total no. of packets 3 | s f e r r e d _ i n _ p

Header | Data payload

To: 192.168.1.5 | From: 192.168.1.2 | Packet no. 3 | of | Total no. of packets 3 | a c k e t s _ _ _ _ _ _

Header | Data payload

To: 192.168.1.5 | From: 192.168.1.2 | Packet no. 1 | of | Total no. of packets 3 | D a t a _ i s _ t r a n

Header | Data payload

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		messages in text). Table group work: using one full set of the 'Packets in a picture' resource, already cut into strips. Choose one to be the recipient and randomly distribute the strips between the rest of the learners. Pass their packets to the recipient in their group who will arrange them into the correct order to reveal the image.	
3 Working together ***You will need a school Google account. If your school doesn't have Google Workspace, you can sign up for a free account***	To explain how sharing information online can help people to work together • I can recognise how to access shared files stored online • I can send information over the internet in different ways • I can explain that the internet allows different media to be shared	Activity 1: Class discussion to consider how people can work together over long distances. Discuss the pros and cons of each option. Activity 2: Working together in small groups but not working at the same table as their group members. Produce a fact file about a country or current topic. Remain in seats and only use the online tools provided to collaborate with their group. Explain that this is because they are working as if they are in different locations. Use features like Chat and Explore via Google Slides to communicate and share ideas. Activity 3: Class discussion on reviewing the activity and compare it to the ways of working discussed at the start of the lesson. Ask them to think, pair, share to discuss the questions on the slide.	Learners will need to access a template in a shared online space. You will need to modify or create templates for each of the groups. An example is provided and will need to be duplicated. Each copy will need to be named with a different country, and then shared with your learner groups. If you have never set up Google Workspace for Education, there is some guidance on how to do it here. You will need to know how to create a presentation file that can be shared among a group of learners working on different computers at the same time; there is some support for Google Slides here. You will need to make each group a copy of the presentation that has a different country's name on it. Only share the presentation with the learners who will use it. You will need to know how to add simple text and images to slides.
4 Shared working	To evaluate different ways of working together online • I can identify different ways of working together online • I can recognise that working together on the internet can be public or private • I can explain how the internet enables effective collaboration	Activity 1: Using a piece of paper and a pencil with three minutes to draw a simple picture. Swap images round and add to it. Collect drawings and share them out randomly amongst the class. When the second stage of drawing is complete, allow the learners who worked on the drawings first to see the finished work. Class discussion to reflect on the outcomes. Activity 2: Use a Scratch project created by someone else. Use Activity 1, change the project to make their own version. Work individually, or as pairs sharing a computer. They may choose to change the project in any way they wish. For example, they could use any blocks, sprites, or colours they want. Activity 3: Sharing work completed from today and class discussion as to how they all look so different.	You should be familiar with Scratch 3 and the See inside and Remix buttons. Learners can view and change other people's work (without changing the original copy). For Activity 2, learners need a Scratch account (if you would like learners to save their work online). For guidance on setting up teacher accounts, please visit the Scratch website. (https://scratch.mit.edu/educators/faq) You should have a basic understanding of copyright and of what is and isn't acceptable to share.
5 How we	To recognise how we	Activity 1: Talking partners to discuss the different methods of how we can communicate the word 'yes'	

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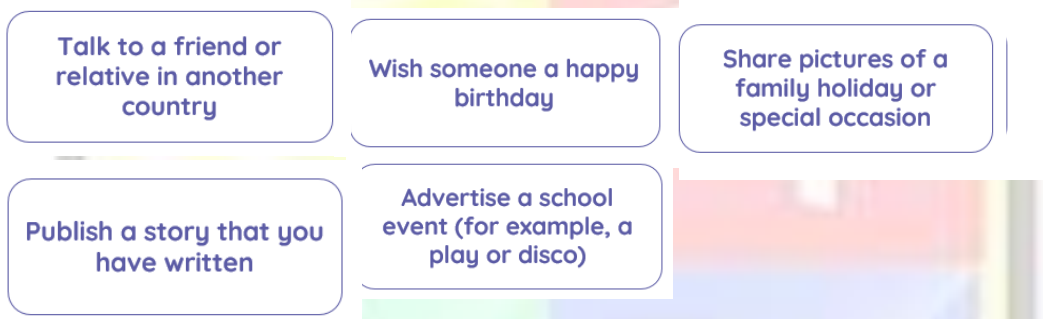
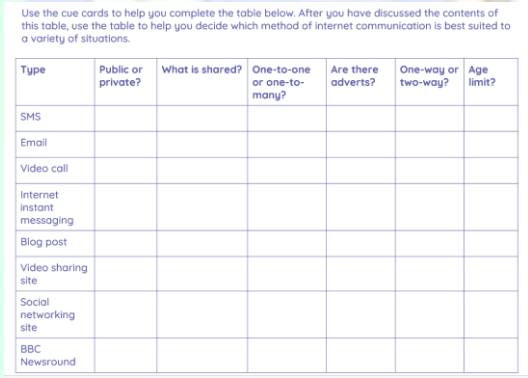
communicate	communicate using technology. ● I can explain the different ways in which people communicate ● I can identify that there are a variety of ways to communicate over the internet ● I can choose methods of communication to suit particular purposes	with each other. Activity 2: Practical: In two minutes, individually make a list on whiteboards of the ways in which they can communicate over the internet. Share lists with the rest of their table (or group) and to agree on a table (or group) list. Share as a whole class. Activity 3: Use one scenario from the handout, printed on A3 paper. Create a mind map of the many different ways that their message could be communicated over the internet. Learners can use the class list created in Activity 2 to help them. (KEEP THESE FOR NEXT LESSON) 	You will need an understanding of the term 'communication', as well as knowledge of different methods of communication. You will need to be familiar with different methods of internet communication, and the suitability of these in a variety of contexts.
6 Communicating responsibly.	To evaluate different methods of online communication ● I can compare different methods of communicating on the internet ● I can decide when I should and should not share information online ● I can explain that communication on the internet may not be private	Activity 1: Think, pair, share some methods of internet communication, recapping the previous lesson. Complete the table working in pairs (worksheet A1). Share out the accompanying cue cards (these can be shared one each, or cut up and shared amongst a group to share).  Use the cue cards to help you complete the table below. After you have discussed the contents of this table, use the table to help you decide which method of internet communication is best suited to a variety of situations. Type / Public or private? / What is shared? / One-to-one or one-to-many? / Are there adverts? / One-way or two-way? / Age limit? SMS Email Video call Internet instant messaging Blog post Video sharing site Social networking site BBC Newsround Activity 2: Use the maps from last lesson and work in groups use sticky notes to use sticky notes to edit their work, to include how their scenario fits some of the criteria from Activity 1 of this lesson. Decide which method(s) of communication they think their scenario is best suited to. Class discussion to explain their decisions and why. Group work: create a top tips list to share with the class about what to do if they see any inappropriate online content. Consolidate ideas as a whole class and make one list. Activity 3: Decide on the three most important things to consider when choosing how to communicate with someone using the internet.	You will need to be familiar with a range of internet-enabled methods of communication, especially the eight methods discussed in this lesson. The notes in the solutions to Activity 1 are a useful prompt for discussions. You should also be aware of how to report inappropriate content online.

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Unit title	Vocabulary:	Device needed:
2. Web Page Creation	Website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, copyright, fair use, purpose, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, implication, external link, embed	Chrome book *Use Google Workspace for education. (Teacher to set up account before starting topic)*

Lesson	Learning objectives	Tasks	Prior Knowledge / Subject knowledge
1. What makes a good website?	To review an existing website and consider its structure • I can explore a website • I can discuss the different types of media used on websites • I know that websites are written in HTML	Activity 1: practical activity using https://kids.sandiegozoo.org/ Read the questions on PPT and search the site to find the answer. Record their answers on whiteboards then share approaches with the class, for best methods. Activity 2: Annotate the worksheet A2 or choose a webpage of their choice and screenshot onto word and annotate. Activity 3: Class discussion on ideas of how web pages are created. Model how to access the code (HTML) on a website. Allow time to do this on their own machines using a website of their choice. 	Teachers will need to be able to access websites. Some understanding of HTML and the difference between browsers, websites, and web pages would be an advantage, but this is supported in the slides.

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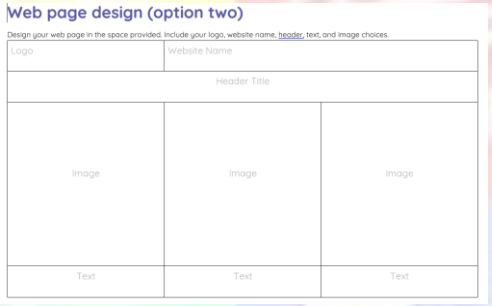
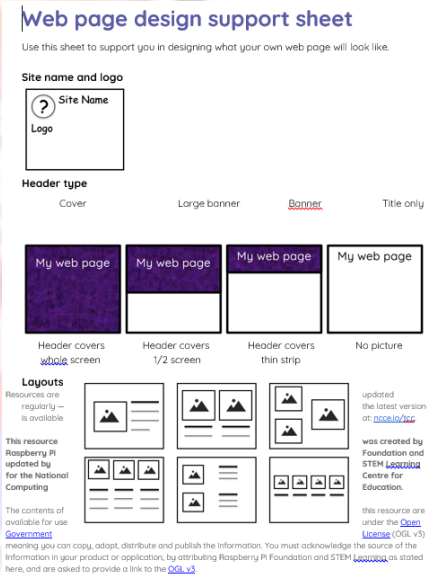
2. How would you lay out your website?	To plan the features of a web page ● I can recognise the common features of a web page ● I can suggest media to include on my page ● I can draw a web page layout that suits my purpose	Introduction: Think, Pair, Share based on the question, "What is the difference between a web page and a website?". Listen to their suggestions. Class discussion on considering the attributes they would need to become a web designer, and what questions would need to be asked when designing and producing web pages. Activity 1: Class discussion on the parameters of designing a webpage for Y6 History topic. Who is your audience? What will be the purpose of your website?" Activity 2: Demonstrate how to open Google Sites and model the videos with step by step instructions of setting up a webpage. Activity 3: Design the home page for their web page on paper via scaffolded or explorer (blank) versions using the support sheet for prompts and ideas.   	Teachers will need to ensure that learners have access to Google Sites. An understanding of Google Sites would be beneficial, however, this will be covered in the slides.

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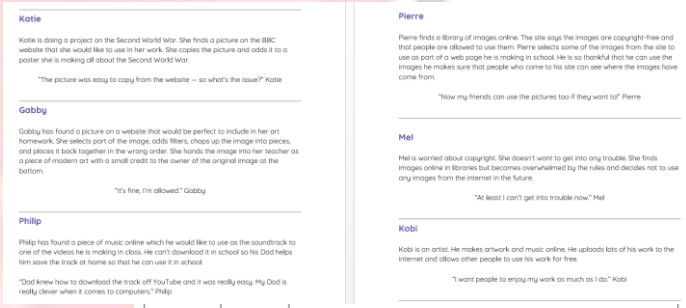
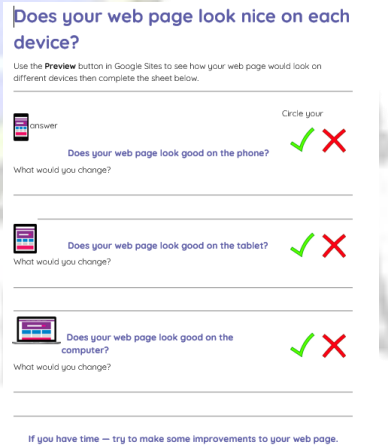
3. Copyright or Copy WRONG?	To consider the ownership and use of images (copyright) • I can say why I should use copyright-free images • I can find copyright-free images • I can describe what is meant by the term 'fair use' • I know how to use technology respectfully and responsibly when online	Introduction: Class discussion on the question: "Where do you get pictures from online? Record/discuss their answers. Ask, "Which of these places are the best/why?". Use a class whiteboard or record using sticky notes so that the list can be referred to later in the lesson. Discuss school procedures for searching online and appropriate steps to take if inappropriate images are found. Activity 1: In pairs, discuss the questions, 'Why is it important that we follow copyright and credit others for their work?' and 'How would you feel if someone stole your work without your permission?' Activity 2: Discuss the school policy for searching and saving images from the Internet. Model saving an image before children find appropriate images for their work/webpage. Activity 3: Using the given scenarios based on the theme of copyright and fair use. Read and discuss each scenario in their group and decide whether or not they are acceptable ways to use someone's work, and will record their answers on the recording sheet.  Katie Katie is doing a project on the Second World War. She finds a picture on the BBC website that she would like to use in her work. She copies the picture and adds it to a poster she is making all about the Second World War. "The picture was easy to copy from the website – so what's the issue?" Katie Gabby Gabby has found a picture on a website that would be perfect to include in her art homework. She selects part of the image, adds filters, chops up the image into pieces, and places it back together in the wrong order. She hands the image into her teacher as a piece of modern art with a small credit to the owner of the original image at the bottom. "It's fine, I'm allowed." Gabby Philip Philip has found a piece of music online which he would like to use as the soundtrack to one of the videos he is making in class. He can't download it in school so his Dad helps him save the track at home so that he can use it in school. "Dad knew how to download the track off YouTube and it was really easy. My Dad is really clever when it comes to computers." Philip Pierre Pierre finds a library of images online. The site says the images are copyright-free and that people are allowed to use them. Pierre selects some of the images from the site to use as part of a web page he is making in school. He is so thankful that he can use the images he makes sure that people who come to his site can see where the images have come from. "Now my friends can use the pictures too if they want to!" Pierre Mel Mel is worried about copyright. She doesn't want to get into any trouble. She finds images online in libraries but becomes overwhelmed by the rules and decides not to use any images from the internet in the future. "At least I can't get into trouble now." Mel Kobi Kobi is an artist. He makes artwork and music online. He uploads lots of his work to the internet and allows other people to use his work for free. "I want people to enjoy my work as much as I do." Kobi Gabby Philip Abdul Pierre Mel Kobi	Teachers should have an understanding of the terms 'fair use' and 'copyright' (supported in the slides). You should also ensure you are aware of your school's procedures related to children searching for images, how to report any issues and using technology safely in and out of school.
4. How does it look?	To recognise the need to preview pages • I can add content to my own web page • I can preview what my web page looks like • I can evaluate what my web page looks like on different devices and suggest/make edits.	Activity 1: Use the tools in the videos from previous lesson to create their own web pages using Google Sites. Distribute the web page plans from previous lessons to build their web pages. Activity 2: Model how a webpage can look on different devices. Use the PPT to demonstrate the differences. Activity 3: Preview their webpage using Google Sites and complete evaluation worksheet A3.  Does your web page look nice on each device? Use the **Preview** button in Google Sites to see how your web page would look on different devices then complete the sheet below. Answer Circle your Does your web page look good on the phone? What would you change? Does your web page look good on the tablet? What would you change? Does your web page look good on the computer? What would you change? If you have time – try to make some improvements to your web page.	Teachers would benefit from knowing how to use Google Sites however, this is supported in the slides.
5. Follow the	To outline the need for a navigation path	Introduction: Think, pair, share question: "Do you know what a navigation path or breadcrumb trail is?" Tell the learners that these are important when we are designing websites. Feedback to the class.	Teachers will need to have an understanding of the

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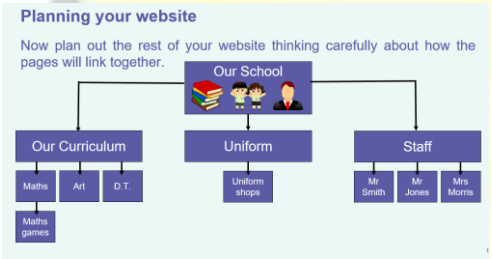
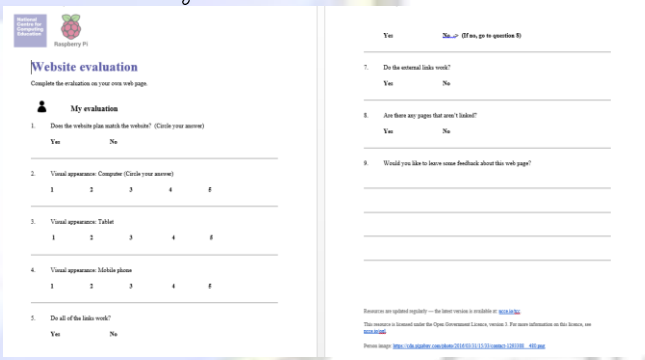
breadcrumbs	• I can explain what a navigation path is • I can describe why navigation paths are useful • I can make multiple web pages and link them using hyperlinks	Activity 1: Model how to create the webpage through the PPT. Activity 2: Use the worksheet A2 and track their activity on the San Diego Zoo website using the example on the board to help. Distribute the sheets and allow time for the learners to complete them.   Activity 3: Plan out own websites on the worksheets provided. Click through the animation to model another example plan to the learners. Activity 4: Adding subpages to the webpages using the PPT to support. Verbal exit tickets: Ask: "What is a navigation path? Why should we think about the navigation path when designing our website?"	terms 'breadcrumb trail' and 'navigation'. An understanding of how websites are structured and linked with hyperlinks would also be an advantage but this is supported in the slides.
6. Think before you link!	To recognise the implications of linking to content owned by other people • I can explain the implication of linking to content owned by others • I can create hyperlinks to link to other people's work • I can evaluate the user experience of a website	Introduction question: "Is it OK to link to content owned by others?", and ask them to consider copyright. Think, pair, share, and then feedback to the rest of the class. Activity 1: Discuss that links outside your own website are called external links. Go through the slides to discuss the different implications that need to be considered when adding external links to your own website. Activity 2: Working individually to search for, and link to, appropriate websites linked to the content on their site. Brief discussion of online safety, learners should only link to sensible sites and reporting any concerns should be discussed here (no use of YouTube). Activity 3: Evaluate a given website from PPT using a set of criteria before they evaluate their own designs using A3 worksheet. Activity 4: Share the webpages they have created with the class. 	It would be beneficial for teachers to have an understanding of using Google Sites but this is supported in the slides. Teachers should be familiar with the implications of linking to other people's work online. You should also ensure you are aware of your school's procedures related to children finding inappropriate content online and how to report any issues.

Unit title 3: Programming A – variables in games	Vocabulary Variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, test, debug, prototype, improve, evaluate, share	Device needed: Chrome book Scratch scratch.mit.edu

Lesson	Learning objectives	Tasks	Prior Knowledge / Subject knowledge

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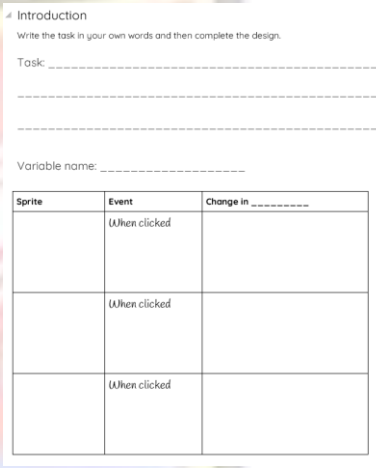
1 Introducing variables.	To define a 'variable' as something that is changeable • I can identify examples of information that is variable • I can explain that the way a variable changes can be defined • I can identify that variables can hold numbers or letters	Introduction: Show questions on the slide and ask them to think about them as they watch the short clip. Activity 1: Working in pairs, on the 'Score change' Scratch project' linked on the slide. Class discussion. Activity 2: Write the task in their own words on activity worksheet before choosing three sprites to add to their activity worksheet A2. Next, ask learners to name their variable, and as precisely as possible, describe how each sprite will change the score. Once completed their designs, share them with a partner and ask if they think they could create a project based on the design. The learners should then refine and improve their design as necessary. Activity 3: Working individually to create their own project, including variables before they compare their completed project with their design and debug (if necessary). Save the completed project. Activity 4: Distribute the activity sheet, and ask learners to find the values for the variables relating to teams and scores.  Introduction Write the task in your own words and then complete the design. Task: _____ _____ _____ Variable name: _____ Sprite / Event / Change in _____ When clicked When clicked When clicked  Solutions: Variable values ESP 0 - 0 ENG Home_team Home_score Away_score Away_team Using the format above, identify the values of each variable in the scores below. GER 0 - 1 MEX Value Home_team Ger Home_score 0 Away_team Mex Away_score 1 SWE 3 - 1 KOR Value Home_team Swe Home_score 3 Away_team Kor Away_score 1	You need to be aware of the concept of variables in programming. In this lesson, a 'variable' is defined as something that can be set and changed throughout the running of a program. This definition will be developed in Lesson 2. You should be familiar with the process of adding a variable, which is outlined in this lesson plan. In Activity 2 and 3, learners move between all four levels of abstraction of the project. This is demonstrated throughout the plan below. You can find more information about levels of abstraction in the unit overview.
2 Variables in programming	To explain why a variable is used in a program • I can identify a program variable as a placeholder in memory for a single value • I can explain that a variable has a name and a value • I can recognise that the	Activity 1: Class discussion on why 'Number' is not a useful name for a variable. In pairs, use sheet or post-it notes to complete unplugged activity to demonstrate that a variable can only hold one value at a time. Choose four values for the variables named 'Favourite food' and 'Number'. Once they have chosen their values, cut out each sticky note' and add a value to the second page for each of the variables to create a sentence.	You need to know that a variable is a placeholder for a single value in the memory of a computer, and that all variables are uniquely named. These concepts are explained in the plan below. You need to know that when the value of a variable is updated, the original value is replaced.

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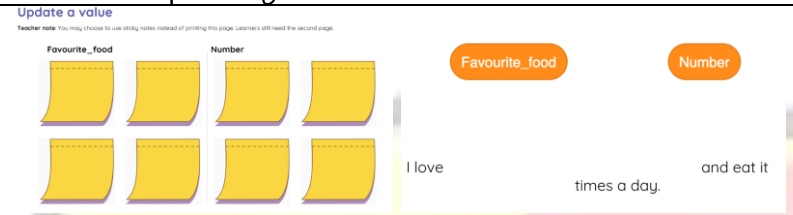
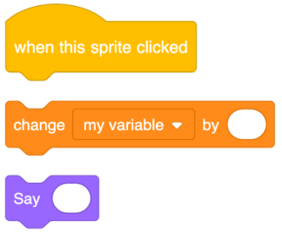
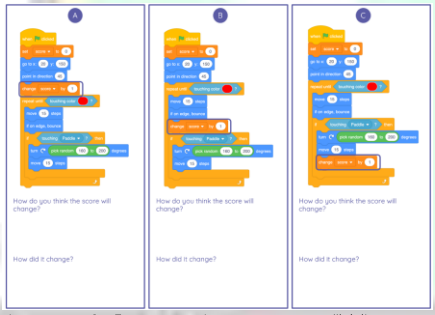
	value of a variable can be changed	 Activity 2: Work through slides on PPT to explore "Which drawer are the pencils in?" to demonstrate how variables can be compared to drawers but only contain one thing in each one. Activity 3: Use the design to create variables, add events, and decide how their variables will change. When choosing how their variables will change, learners need to select the variable that they have created from the change my variable by () block. Extend to explorers task for HA.  Complete quiz on PPT with whiteboard responses.	
3 Improving a game	To choose how to improve a game by using variables ●I can decide where in a program to change a variable ●I can make use of an event in a program to set a variable ●I can recognise that the value of a variable can be used by a program	Activity 1: Share the project and ask what could be set and changed to improve the game. Open the 'Pong' Scratch project on the slide. Working in partners to create a 'score' variable in the Scratch project just as they did in Lesson 2. Use the activity worksheet A1 to add a change score by 1 block to the existing program in three different places – A, B, and C – which are shown on the slide. Make predictions on the activity sheet for what will happen to the score when the block is added at each position, before testing it using a computer.  Activity 2: Discuss the question: "What would happen if the score was never reset in a game?" Once complete, experiment with different values in multiple change score by blocks. Activity 3: Demonstrate the value of a variable can be used by a program to perform other tasks. Build the slide to demonstrate the operator blocks. Direct learners back to the 'Pong' Scratch project and ask them to click the Paddle sprite. Ask learners to click the Operators category. Ask them to add the = operator block to the if then block in the code. The learners can choose what action will take place when the score reaches a set value.	You will need to apply the knowledge of variables that has been developed up to this point in the unit
4 Becoming a	To design a project that	Introduction: Use the Fruit catcher remix' Scratch project on the slide. Leave the questions visible on the slide, and	You will need to be familiar with

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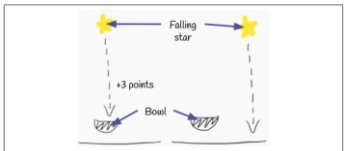
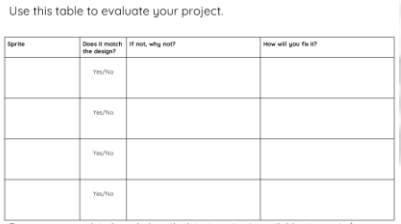
games designer.	builds on a given example • I can choose the artwork for my project • I can create algorithms for my project • I can explain my design choices	ask learners to try the project (a straightforward catching game). Once they have had a short amount of time to explore the game, ask them to think, pair, share their answers to the questions on the slide. Activity 1: Work individually to choose two additional sprites to fall down the screen and a background for their project and record their choices on the activity worksheet A1. (include the name of each sprite and the background.) Activity 2: Design algorithms for the two sprites that they have added. Show learners the suggestions on the slide to help them get started. Create the algorithms. (Recording on A1 worksheet) **Project design** **Sprite 1** Name: Falling star **Sprite 2** Name: **Sprite 3** Name: **Background:** **Activity 2: Falling star algorithm**  The falling star moves down by eight from a random x position at the top of the screen. If the sprite falls onto the bowl, change the score by three. It falls again from a random x position at the top of the screen. If the falling star touches the screen bottom, it falls again from a random x position at the top of the screen. **Falling _____ algorithm** The falling _____ moves down by __ from a random x position at the top of the screen. If the sprite falls onto the bowl, change the score by __. It falls again from a random x position at the top of the screen. If the falling _____ touches the screen bottom, it falls again from a random x position at the top of the screen. Activity 3: Swap ideas with a partner and discuss their project ensuring they can answer all questions on the slide.	the four levels of design – known as 'levels of abstraction'. In this lesson, learners move between the 'design' and 'running the code' levels of abstraction. You can find more information about levels of abstraction in the unit overview. This lesson and Lesson 5 also involve Use-Modify-Create as a pedagogy to teach programming. In this lesson, learners use elements of an existing project and consider how they could modify it. In Lesson 5, they will create their own project. You will need a clear understanding of the definition of the term 'algorithm'. This is defined in the outline plan below.
5 Design to code	To use my design to create a project • I can create the artwork for my project • I can choose a name that identifies the role of a variable • I can test the code that I have written	Introduction task: Share the 'Intro chatbox' Scratch project. Play through the project and note down on their individual whiteboards where variables might be used in the program. Discuss as a class. Activity 1: Think, pair, share, "What is the first thing you need to add to your project?". Then add the artwork for their projects using their designs. Add the two additional sprites and their background to the project. Activity 2: Think, pair, share to suggest better names for the two variables shown on the slide. Open the Scratch project and run the chatbot program again, this time with the code visible. Give time to suggest alternative names for the variables. Learners should suggest 'age' for 'variable_a' and 'name' for 'variable_b'. Activity 3: Test and debug their project and record their findings on the activity sheet. In doing this, they need to be mindful of the original task – does the project deliver against the original requirement? Exit activity: think, pair, share, "How could your game end?". Take some suggestions and share a new algorithm and ask them what they would Use this table to evaluate your project. 	This lesson is based around the 'levels of abstraction' approach to design in programming, which is explained in the unit overview. In this lesson, learners begin at the 'code' level to create and name variables. They then work through all levels of abstraction, from the 'task' to 'running the code', to create their own game

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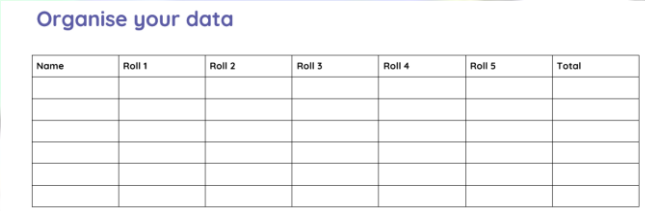
		name the variable, based on the algorithm.	
6 Improving and sharing	To evaluate my project • I can identify ways that my game could be improved • I can use variables to extend my game • I can share my game with others	Introductory task: Think, pair, share some of the similarities and differences between these projects on slides, and their own work. Discuss how they could use some of the ideas from these projects to improve their project. Activity 1: Talking partners to thiyhgnk and discuss what they would change in their projects. Explain that they can make any improvements they like, but the fundamental objective of the game must remain the same – to catch falling objects Activity 2: Share the 'Banana overload' Scratch project and emphasise the 'missed' variable in this game. Use slides to demonstrate and model before choosing how they would like to represent the algorithm. Add the 'lives' variable to their programs. Activity 3: Save project, and to click on Share, for others to access to evaluate another learner's project. Use activity sheet A3 to fill in their own name and the nine-digit number at the end of their project's URL. Emphasise that they need to copy the number carefully. 	This lesson gives learners the opportunity to improve their projects and apply what they have learnt from throughout the unit. No new blocks or concepts are introduced. However, it is useful to have a good all-round knowledge of Scratch for this lesson, as learners may choose a variety of different ways to improve their project

4. Unit title: Data and Information	Vocabulary: Data, collecting, table, structure, spreadsheet, Cell, cells, cell reference, data item, format, formula, calculation, input, output, calculate, operation, range, duplicate, sigma, propose, question, data set, data, organised, chart, evaluate, results, comparison, questions, software, tools.	Device needed: Chrome book (Excel Spreadsheets)

Lesson	Learning objectives	Tasks...	Prior Knowledge / Subject knowledge
1. Collecting data	To create a data set in a spreadsheet • I can collect data • I can suggest how to structure my data • I can enter data into a spreadsheet	Activity 1: In table groups, roll a dice five times and collect their scores. Collect the scores for the whole table and record them in the same place. Learners could use dry wipe boards or pens/pencils and paper. Activity 2: Working in pairs with the activity sheet to organise the data collected from the table.  Activity 3: Discussion on what they could use to make a table on a computer. Using Excel, copy the headers from the paper activity onto the spreadsheet.	It would be beneficial for teachers to have an understanding of a spreadsheet application, eg Google Sheets, or alternative software such as Microsoft Excel or 'Purple Mash - 2Calculate'. An understanding of the terms 'data', 'data set', and 'data headings' is also important, as they are key concepts throughout this lesson. Note: The resources in this unit assume the use of Google Sheets

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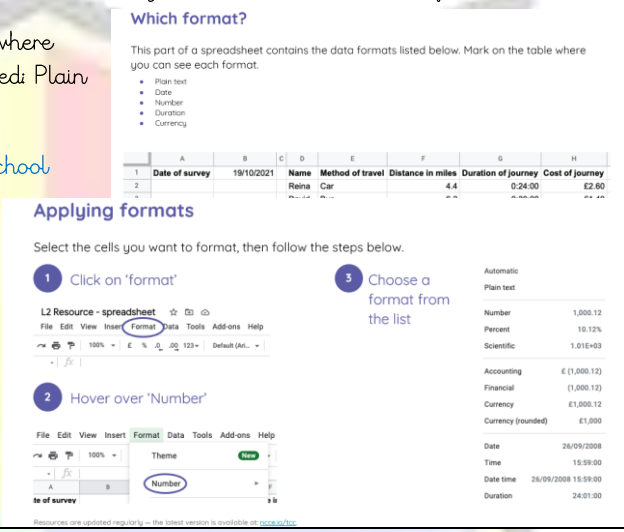
<table>
<tr>
<td>2. Formatting a spreadsheet</td>
<td>To build a data set in a spreadsheet
• I can explain what an item of data is
• I can choose an appropriate format for a cell
• I can apply an appropriate format to a cell</td>
<td>Activity 1: Class discussion on PPT images (slide 6). Paired work to write on dry wipe boards to identify what is contained in cells A2, B5, C3, and B1. Discuss what they notice about the contents of these cells.

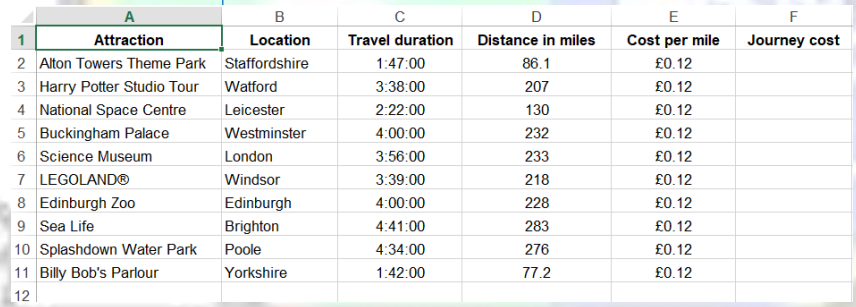
Activity 2: Distribute the handout A2 and mark where they think the following formats have been applied: Plain text, date, number, duration and currency.

Activity 3: Create own version of the travel to school table from the previous activity. Use the spreadsheet resource A3 and populate it with the data set. Apply formatting to the cells on their spreadsheet.


</td>
<td>You will need to be familiar with the way in which cells in spreadsheets can be formatted. Formatting is used to make data easier to work with and more readable. For example, a currency formatted cell will include a unit of currency and can be set to include decimal places. This lesson looks at the following formats:
• Plain text
• Date
• Number
• Duration
• Currency</td>
</tr>
<tr>
<td>3. What's the formula?</td>
<td>To explain that formulas can be used to produce calculated data

• I can explain which data types can be used in calculations
• I can construct a formula in a spreadsheet
• I can identify that changing inputs changes outputs</td>
<td>Activity 1: Whole class responses using the whiteboards to respond to questions from PPT.

Activity 2: Think, pair, share: "How would you calculate the cost of petrol from school to one of the attractions?" In pairs, create the formulas to work out the cost of a trip from school to each of the attractions on their spreadsheet.



Activity 3: Whole class: look at two examples of calculations. One which uses numbers, and the other that uses cell references. Show the learners the video. At the end, think, pair, share: "Why do the formulas with cell references update but the formulas using just numbers don't?" Take feedback.</td>
<td>An understanding of how computers deal with different data types in different ways, and an ability to construct formulas using Google Sheets would be beneficial. Knowledge that once a formula based on cell references is entered into the spreadsheet, if the input is changed, the output will reflect this. These skills are supported in the slides.</td>
</tr>
</table>

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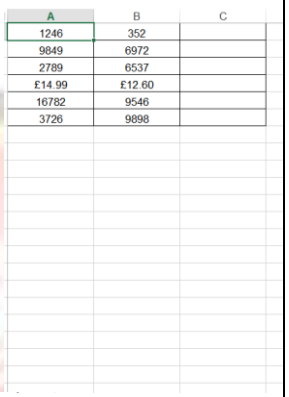
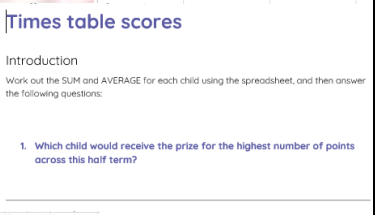
4. Calculate and duplicate	To apply formulas to data ● I can calculate data using different operations ● I can create a formula which includes a range of cells ● I can apply a formula to multiple cells by duplicating it	Activity 1: Class discussion on the question: "What formula would you type into cell C1 to answer this question?" Working in pairs with a copy of 'Using the four operations' spreadsheet taking care to remember which tab they are on to complete the different calculations. Activity 2: Working in pairs creating formulas using the ∑ function button with a small amount of data. Discuss the scenario: Provide 'Times table test' worksheet. Working in pairs to answer the questions by using a copy of the 'Times table scores' worksheet to work out the SUM and AVERAGE for each child. Activity 3: Working in pairs to use the screenshot of part of the 'Shopping' spreadsheet. Discuss that this is only part of the spreadsheet that they will use as they will be dealing with more data and that they may need to scroll down their page. Talk through the different data headings. Use a copy of the 'Shopping' spreadsheet. Scaffold for LA ability children if needed.	An understanding of how addition, subtraction, multiplication, and division calculations can be performed in a spreadsheet using formulas would be beneficial. An ability to create formulas that include a range of cells (such as the use of the SUM or AVERAGE functions) and using duplicate to copy formulas into multiple cells would also be an advantage. These skills are supported in the slides.
5. Event planning	To create a spreadsheet to plan an event ● I can use a spreadsheet to answer questions ● I can explain why data should be organised ● I can apply a formula to calculate the data I	Activity 1: Working in pairs to use a spreadsheet to plan a celebratory event for the class. They will need to enter the data they would like to include, and will use the final spreadsheet to answer the question: "What is the total party cost for your event? "Use the event planning handout to choose options. (1 between 2)	It would be beneficial to have an understanding of Google Sheets, including copying and pasting cells, entering data, creating formulas, using functions such as SUM, and duplicating formulas across multiple cells. These skills have been covered in previous lessons during this unit.



	A	B	C
	1246	352	
	9849	6972	
	2789	6537	
	£14.99	£12.60	
	16782	9546	
	3726	9898	

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Katie	0	0	9	8	7	8
Paul	10	6	6	7	7	8
Helena	9	6	7	8	9	10
Reina	10	9	9	8	10	6
David	5	6	7	5	4	6
Chloe	4	9	8	9	6	5
Abdul	7	7	7	7	7	7
Yiannis	10	9	9	6	7	6
Gino	4	5	4	0	10	10



Times table scores

Introduction

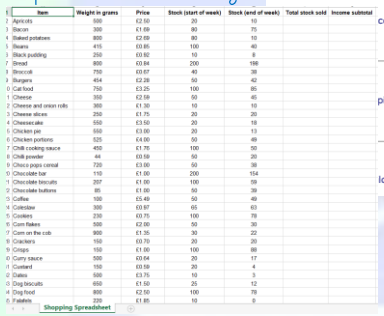
Work out the SUM and AVERAGE for each child using the spreadsheet, and then answer the following questions:

1. Which child would receive the prize for the highest number of points across this half term?

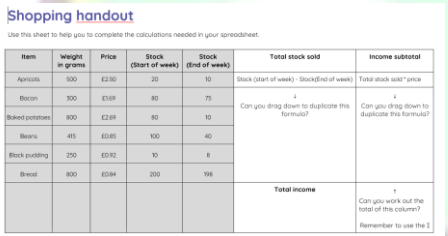
ceived the lowest average score?

pils scored more than 40 points for the half term?

ldren scored exactly 33 points across this half term?



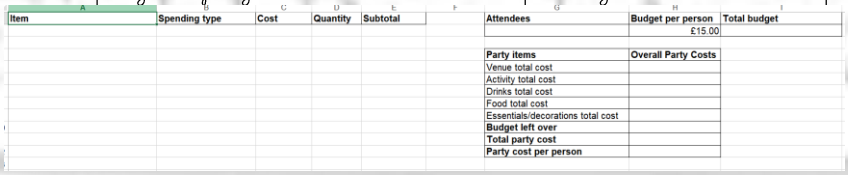
Shopping Spreadsheet



Shopping handout

Use this sheet to help you to complete the calculations needed in your spreadsheet.

Item	Weight in grams	Price	Stock (Start of week)	Stock (End of week)	Total stock sold	Income subtotal
Apricots	500	£2.50	20	10	Stock (start of week) - Stock(End of week)	Total stock sold * price
Bacon	300	£3.69	80	75	↓ Can you drag down to duplicate this formula?	↓ Can you drag down to duplicate this formula?
Baked potatoes	800	£2.69	80	10		
Beans	415	£0.85	100	40		
Black pudding	250	£0.92	10	8		
Bread	800	£0.84	200	198		
					Total income	↑ Can you work out the total of this column? Remember to use the Σ



	A	B	C	D	E	F	G	H	I
	Item	Spending type	Cost	Quantity	Subtotal		Attendees	Budget per person	Total budget
								£15.00	
							Party items	Overall Party Costs	
							Venue total cost		
							Activity total cost		
							Drinks total cost		
							Food total cost		
							Essentials/decorations total cost		
							Budget left over		
							Total party cost		
							Party cost per person		

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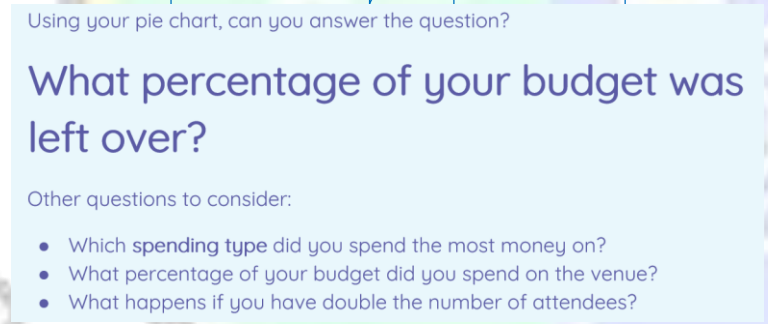
	need to answer questions	Activity 2: Working in partners to calculate the data entered onto their spreadsheets for the quantity and subtotal columns. Remind the learners to use their 'Data calculations' handout to support them. Activity 3: Calculate their final figures. Once all of the cells have been completed, calculate the budget left over, total party cost, and party cost per person. Add their formulas into the cells underneath overall party costs. Once completed, Think, pair, share the question, "Can you answer the question using the data on your spreadsheet?" Class discussion what other information they could tell you, using the data on their completed spreadsheets.  **Event planning** Introduction Use the information below to plan an event for the end of Year 6. Note: p.p. = per person **Venue hire** (Cost) School hall FREE Hotel £150.00 Bowling alley See activities p.p. Laser Quest See activities p.p. **Activity** (Cost) Disco £150.00 Party games/prizes £20.00 Bowling £5.95 p.p. Laser Quest £5.95 p.p. **Hot food** (Cost) Burger £2.95 p.p. Veggie burger £2.80 p.p. Chicken nuggets £2.65 p.p. Mozzarella bites £2.50 p.p. Pizza £3.00 p.p. Chips £2.00 p.p. **Drinks** (Cost) Lemonade £0.04 per cup Cola £0.04 per cup Cherryade £0.06 per cup Blackcurrant juice £0.03 per cup Orange juice £0.03 per cup Water FREE **Cold food** (Cost) Sausage rolls £0.11 p.p. Veg. sausage rolls £0.20 p.p. Sandwiches £0.50 p.p. Crisps £0.20 p.p. Cakes £0.10 p.p. Biscuits £0.08 p.p. **Essentials/Decorations** (Cost) Plates £0.10 p.p. Cups £0.15 p.p. Napkins £0.05 p.p. Balloons £1.00 p.p. Party bag (filled) £2.00 p.p. Table cloth £1.50 Helium balloon £3.50 Balloon arch £30.00 Resources are updated regularly – the latest version is available at: nccea.by/xx	Learners have been provided with the mathematical calculations they need to complete the activities in this lesson in the 'Data calculations' handout. It is important that learners are given the opportunity to demonstrate their ability to use the computational skills required, regardless of their mathematical ability.
6. Presenting data	To choose suitable ways to present data • I can produce a chart • I can use a chart to show the answer to a question • I can suggest when to use a table or chart	Activity 1: Working in pairs to make a pie chart based on the spreadsheet they created in Lesson 5. Use the 'Party spreadsheet pie chart' example to model. Use the information to create own chart using their own data. Once completed, answer the question posed with their partner.  Using your pie chart, can you answer the question? **What percentage of your budget was left over?** Other questions to consider: • Which **spending type** did you spend the most money on? • What percentage of your budget did you spend on the venue? • What happens if you have double the number of attendees? Activity 2: Think, pair, share: "When might you use a table on a spreadsheet and when might you use a chart? Take feedback. Show three different scenarios, to think, pair, share, whether they would use a spreadsheet table or a chart to show the data. Activity 3: Using whiteboards, children respond to the questions posed on the PPT. Discuss answers and reasoning.	It would be beneficial to have an understanding of how to create charts within spreadsheet applications. An ability to evaluate charts to answer questions would also be an advantage. An understanding of the tools available within spreadsheet applications such as formulas and charts would also be helpful, however, each of these skills is supported in the slides.

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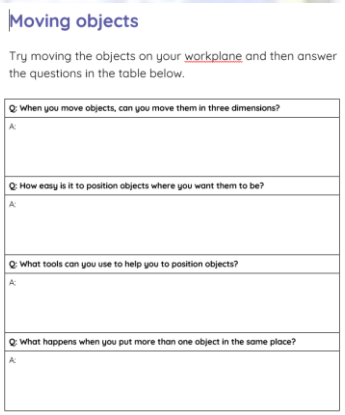
Unit title 5: Creating media (3D modelling)	Vocabulary: 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, placeholder, hollow, choose, combine, onstruct, evaluate, modify	Device needed: Chrome book TinkerCad tinkercad.com

Lesson	Learning objectives	Tasks	Prior Knowledge / Subject knowledge
1 Introduction to 3D modelling	To recognise that you can work in three dimensions on a computer ●I can add 3D shapes to a project ●I can view 3D shapes from different perspectives ●I can move 3D shapes relative to one another	Activity 1: Working in pairs on the introductory task in Tinkercad where they will place a cube and a sphere next to each other, as shown on the slide. Activity 2: Each child to draw a quick sketch of the objects (cube and sphere) from where they are sitting. Compare sketches on the table and explain what they notice. Using Tinkercad, manipulate the shapes on the computer and compare these to their paper version in a class discussion. Activity 3: Explore selecting an object on the program before individually, complete the handout A3, which includes the questions listed on slides.  Moving objects Try moving the objects on your workplane and then answer the questions in the table below. Q: When you move objects, can you move them in three dimensions? A: Q: How easy is it to position objects where you want them to be? A: Q: What tools can you use to help you to position objects? A: Q: What happens when you put more than one object in the same place? A:	You will need an understanding of the properties of 2D and 3D shapes, such as those specified in the Mathematics National Curriculum for KS1 and KS2. You will also need to be familiar with creating, selecting, and moving 3D objects within Tinkercad, including how to view them from different perspectives. Tinkercad's Start Learning 3D tutorials provide a good starting point: https://www.tinkercad.com/learn/designs
2 Modifying 3D objects	To identify that digital 3D objects can be modified ● I can resize an object in three dimensions ● I can lift/lower 3D objects ● I can recolour a 3D object	Activity 1: Working in partners following the slide instructions of using handles. Working individually, try each of the different types of handles. Class discussion on how they all work.	You will need to be familiar with resizing, lifting/lowering, and altering the colour of 3D objects in Tinkercad. Tinkercad's Start Learning 3D tutorials provide a good starting point: https://www.tinkercad.com/learn/designs

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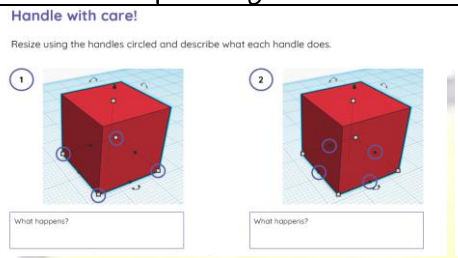
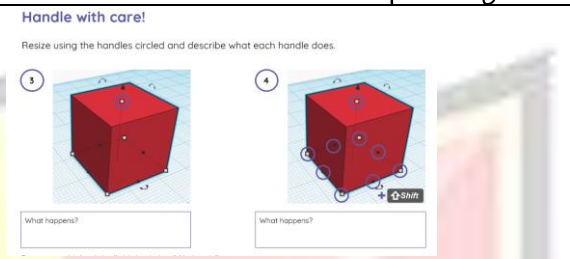
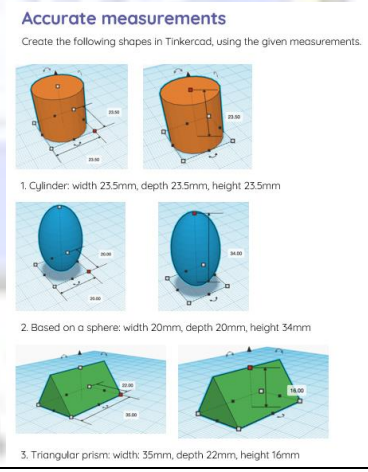
		  Activity 2: Working individually to manipulate a cuboid and a triangular prism so that they are the same size and the triangular prism is on top of the cuboid, creating a house-type shape. Move, resize, and lift the triangular prism so that it sits neatly on top of the cuboid. Save work. Discuss strategies and what handles were needed. Activity 3: Re-colour the objects on their workplane, or add further objects of different colours.	
3 Make your own name badge	To recognise that objects can be combined in a 3D model • I can rotate objects in three dimensions • I can duplicate 3D objects • I can group 3D objects	Activity 1: Individually explore rotating their shape round. Add text by clicking on 'TEXT' in the basic shapes section. Activity 2: Create an object and duplicate it. Once it has been duplicated, use the techniques to edit their shapes by resizing, lifting/lowering, rotating, changing colour. Activity 3: Individually make their own version of a name badge – they can use the example on slides for ideas, but they should also use their own ideas. Save or screenshot work.	You will need to be familiar with rotating, duplicating, and grouping 3D objects in Tinkercad. Tinkercad's Start Learning 3D tutorials provide a good starting point: https://www.tinkercad.com/learn/designs
4 Make a desk tidy	To create a 3D model for a given purpose • I can accurately size 3D objects • I can show that placeholders can create holes in 3D objects • I can combine a number of 3D objects	Activity 1: Modelled and direct teach / demonstration in Tinkercad on how to create a desk tidy. Children to work in pairs to follow the slide instructions, step by step before completing the task as a pair. Activity 2: Working in pairs to follow the steps in the slide (and on the handout A2) to create their own hollowed out cylinder. 	You will need to be familiar with using 3D objects as placeholders in Tinkercad. Tinkercad's Start Learning 3D tutorials provide a good starting point: https://www.tinkercad.com/learn/designs.

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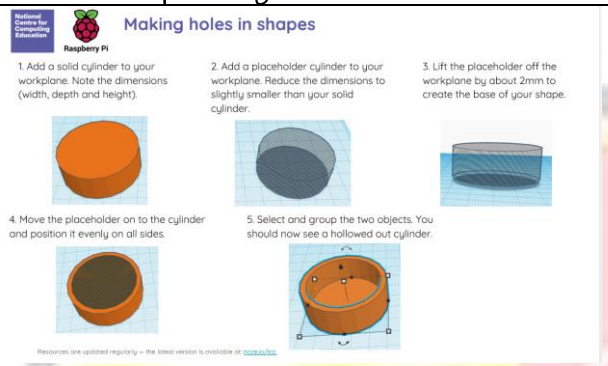
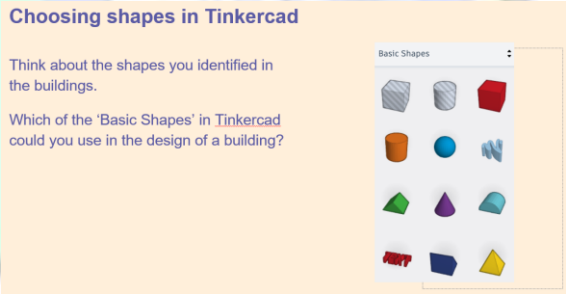
		 Activity 3: Repeat the process, but change the dimensions to make the remaining cylinders, or duplicate it and resize the first cylinder. Use the image of a 3D model of a desk tidy on slide 16. Create their own version in Tinkercad.	
5. Planning a 3D model	To plan my own 3D model • I can analyse a 3D model • I can choose objects to use in a 3D model • I can combine objects in a design	Activity 1: Think, pair, share ideas. Show slide 7. Modelled learning: Play the animation to show the house being pulled apart. In partners, using the given links for an exploding diagram (which are on slide 8) to the three projects, so that they can pull them apart themselves. Highlight that some of the projects may have the shapes locked together. To release them, learners need to select the shapes and then click on the padlock symbol, making sure it is left in the open position. Activity 2: Working in partners to browse the shapes available in Tinkercad, to give them ideas for their own building designs.  Activity 3: Individually, sketch out a design for a 3D building, (explaining that the buildings are being created in Tinkercad, so it would be advisable for them to use shapes which are available in the application) Identify and label the shapes they will use in their design, as shown in the example on the slide.	You will need to be familiar with grouping and ungrouping objects in Tinkercad. Tinkercad's Start Learning 3D tutorials provide a good starting point: https://www.tinkercad.com/learn/designs

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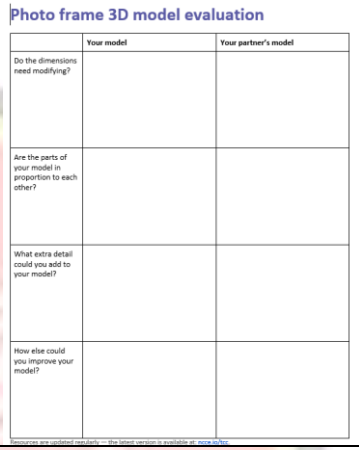
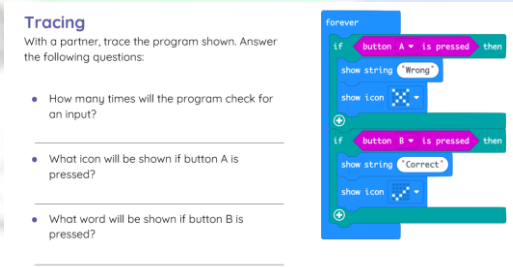
6. Make your own 3D model	To create my own digital 3D model • I can construct a 3D model based on a design • I can explain how my 3D model could be improved • I can modify my 3D model to improve it	Activity 1: Using slide 5 (basic instructions to help learners to create their design in Tinkercad). Working individually to create their own design using the plan from previous lesson. Activity 2: Evaluate the model and that of their partner. Use handout A2 to record feedback.  **Photo frame 3D model evaluation** Your model / Your partner's model Do the dimensions need modifying? Are the parts of your model in proportion to each other? What extra detail could you add to your model? How else could you improve your model?	You will need to be familiar with using 3D objects as placeholders in Tinkercad. Tinkercad's Start Learning 3D tutorials provide a good starting point: https://www.tinkercad.com/learn/designs

Unit title **6: Programming B - sensing movement**	**Vocabulary** Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, selection, sensing, accelerometer, value, task, design, algorithm, program, outcomes, implement, design, algorithm, program, test, run, debug, test, setup	**Device needed:** Micro:bit https://microbit.org/get-started/user-guide/overview/

Lesson	Learning objectives	Tasks	Prior Knowledge / Subject knowledge

1 The micro:bit	To create a program to run on a controllable device
	• I can apply my knowledge of programming to a new environment
	• I can test my program on an emulator
	• I can transfer my program to a controllable device
		Activity 1: Work in pairs and use the MakeCode environment (the block-based programming environment for the micro:bit) using the link on the slide.
		Create a new project, following the instructions on the slide.
		
		Activity 2: Work with a partner using A2 sheet to create own project in 'MakeCode' using the algorithm presented on the slide. Once
		
		 
		Tracing
		With a partner, trace the program shown. Answer the following questions:
		• How many times will the program check for an input?
		• What icon will be shown if button A is pressed?
		• What word will be shown if button B is pressed?
		forever
		if button A is pressed then
		show string "Wrong"
		show icon
		if button B is pressed then
		show string "Correct"
		show icon
			You will need to be familiar with the different parts of a micro:bit – you can find more information in the L1 Resource: Parts of a micro:bit. You will also need an understanding of the micro:bit as an input, process, output device, and to be familiar with the MakeCode coding environment. You can find more information about the new micro:bit here: https://microbit.org/get-started/user-guide/overview/
			
			There are some similarities between Scratch and MakeCode, however, there are also some differences. For example, in MakeCode, a wrap-around block such as on start, forever, or on button pressed is needed for a program to execute. If one of these is not present, then the blocks will appear 'greyed out' in the programming area, like the example below.

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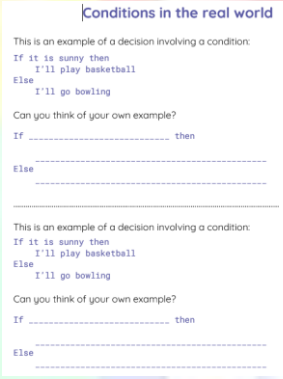
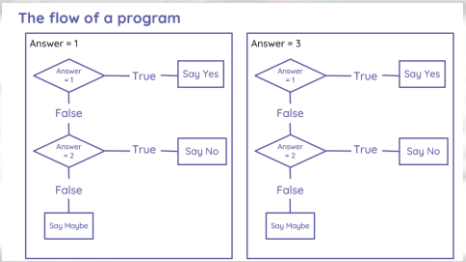
		completed, test the program using the emulator and return to the code to work out any bugs. Activity 3: Download the code from the programming environment to the 'downloads' folder on the computer. Copy the .hex file created onto the micro:bit; the micro:bit will appear as a removable hard disk drive on the computer. Run the program on the micro:bit and evaluate.	 During this lesson, learners will create code in MakeCode, download it to their computer, and then 'flash' their programs to a micro:bit. The code is initially created on a website, clicking on Download moves it to the local machine in the form of a .hex file. Flashing takes place when the code is copied to the micro:bit. This is a process whereby each time a program is written to the device, the entire memory is wiped before the new program is added. The process of flashing programs to the micro:bit will vary depending on the operating system and browser being used on the computer creating the program. You may wish to familiarise yourself with the process – further instructions can be found here: https://support.microbit.org/support/solutions/articles/19000013986-how-do-i-transfer-my-code-onto-the-micro-bit-via-usb.
2 Go with the flow	To explain that selection can control the flow of a program • I can identify examples of conditions in the real world • I can use a variable in an if, then, else statement to select the flow of a program • I can determine the flow of a program using selection	Activity 1: Working in pairs, using the A1 Activity sheet to think, pair, share own examples of real-world 'if, then, else' statements in a similar format to the statement on the slide.  Activity 2: Make a new project in MakeCode and name it 'fortune teller'. generate a random number. Use A2 Handout and create the program. Use the emulators to help identify any bugs in the code. Modify the code, if they need it. Activity 3: Think, pair share, what flow the program will follow if the answer is 2. Take suggestions and build the slide to show the flow. Working in pairs to complete A3 Activity sheet, shade their activity sheet to show the direction of flow.. 	You will need to be familiar with the programming construct of selection. This is introduced in the NCCE Year 5 units, with if statements covered in 'Programming A - Selection in physical computing', and 'if, then, else' in 'Programming B - Selection in quizzes'. This lesson introduces program flow – this is the order in which commands are executed (run) in a program. The diagrams in this, and subsequent lessons are indicative of the program flow, but may not be a true representation of the full sequence of the program.

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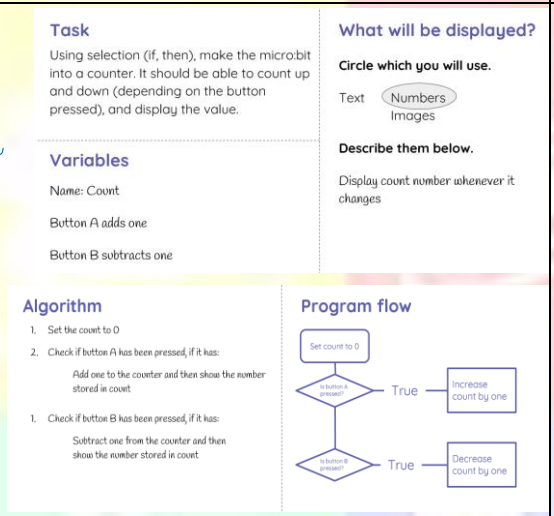
3 Sensing input	To update a variable with a user input • I can use a condition to change a variable • I can experiment with different physical inputs • I can explain that checking a variable doesn't change its value	Activity 1: Think, pair, share, "What is the first thing you need to do when working with a variable?" Take feedback. In pairs, create a program that will change a variable when a button is pressed and display the value. Complete this using the wrap-around Input blocks, but that the challenge in this task is to use selection from the Logic blocks. Use A1 Handout. The design for this project has been completed already. Children need to follow the design to create their program in MakeCode. Some of the blocks they will need to use are on the slide. Debug where needed.  **Task** Using selection (if, then), make the micro:bit into a counter. It should be able to count up and down (depending on the button pressed), and display the value. **Variables** Name: Count Button A adds one Button B subtracts one **What will be displayed?** **Circle which you will use.** Text Numbers Images **Describe them below.** Display count number whenever it changes **Algorithm** 1. Set the count to 0 2. Check if button A has been pressed, if it has: Add one to the counter and then show the number stored in count 1. Check if button B has been pressed, if it has: Subtract one from the counter and then show the number stored in count **Program flow** Set count to 0 Is button A pressed? True Increase count by one Is button B pressed? True Decrease count by one Activity 2: Working in pairs to adapt the program so that the counter changes when the micro:bit is moved. Learners may choose any of the options from the is gesture block. Remind to continue using the emulator to check their code as they create it. Activity 3: Think, pair, share, "How would you show the value of the count variable?" Take feedback. Using individual whiteboards, or scrap paper, ask the learners to note down the count variable value each time the micro:bit is shaken. They should have five values by the end of the video. Think, pair, share, "Does the value of the count variable change when it is checked by the program?" Take feedback.	You will need to be familiar with the input capabilities of a micro:bit, especially the accelerometer, which senses movement. For more information, visit https://microbit.org/get-started/user-guide/overview/ . You will also need to be familiar with the programming constructs of selection and variables

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4 Finding your way	To use an conditional statement to compare a variable to a value • I can use an operand (e.g. <> =) in an if, then statement • I can explain the importance of the order of conditions in else, if statements • I can modify a program to achieve a different outcome	Activity 1: create an interactive quiz using selection. Discuss the initial ideas with a partner or a small group. Use A1 Activity sheet. Activity 2: Individually complete A2 Activity sheet. For each question, provide an action if the correct answer is given (if the condition is true), and an action for an incorrect answer (if the condition is false). For each outcome, choose what the sprite will say. Also choose to make the sprite move or change in some way, e.g. change colour. Only choose actions in Scratch with which they are familiar. Complete at least two questions on the design template, with associated answers (conditions) and actions (outcomes). Activity 3: A3 Activity sheet. Follow the design template through, and identify the outcome for each question. They should circle or highlight that outcome on their activity sheets.	If the compass is being used on the micro:bit for the first time, the device will prompt the user to move it in a number of different directions so that it orientates correctly. Simply follow the instructions on the LEDs to complete this process. The 'Using a micro:bit for directions' activity is structured around the levels of abstraction (LOA) theory of design. More guidance on LOA is included in the unit overview.
5 Designing a step counter.	To design a project that uses inputs and outputs on a controllable device • I can decide what variables to include in a project • I can design the algorithm for my project • I can design the program flow for my project	Activity 1: Use the completed copies of the 'Creating a design' design template activity sheet from the previous lesson. Create an interactive quiz using selection. Run and test programs. Use their designs from the previous lesson to implement the first parts of their algorithm as a program using the Scratch programming environment. Activity 2: Talking partners to respond to the questions on the slide. Then test their	This lesson draws on the concept of levels of abstraction (LOA) for design in programming. Learners are provided with the task and will be working at the design level. You will need to have a clear understanding of the algorithm part of the design process. An explanation of LOA is included in the unit overview. An example step counter project is included. The completed designs from this lesson will be needed for Lesson 6. It would be helpful if feedback could be provided for learners to reflect on at the beginning of Lesson 6.

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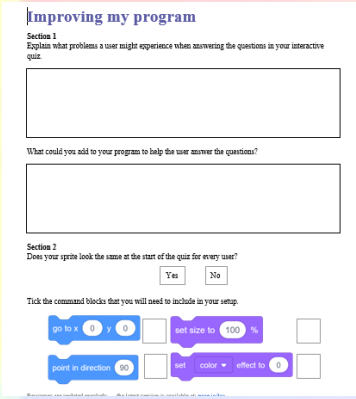
		programs. They should run their program once and enter the correct answer. Debug, test and re-run programs. Activity 3: Use sticky notes to leave feedback after using another learner's quiz. The programs can be shared in various ways, most simply by learners swapping devices. Give time to use other people's quizzes, and leave positive comments.	
6 Making a step counter	To develop a program to use inputs and outputs on a controllable device • I can create a program based on my design • I can test my program against my design • I can use a range of approaches to find and fix bugs	Activity 1: In talking pairs to discuss and feedback on the scenario displayed. Identify ways in which it could be improved. Use A1 Activity sheet, and complete section 1 by thinking about how they could improve their programs so that the users know how to answer the questions.  Improving my program Section 1 Explain what problems a user might experience when answering the questions in your interactive quiz. What could you add to your program to help the user answer the questions? Section 2 Does your sprite look the same at the start of the quiz for every user? Yes No Tick the command blocks that you will need to include in your setup. go to x 0 y 0 set size to 100 % point in direction 90 set color effect to 0 Activity 2: Complete section 2 of the 'Improving my program' worksheet, and ask them to think about the first question. Take feedback. Return to the 'Improving my program' activity sheet. Tell them to tick the boxes to indicate which command blocks they will need to use in the setup for their quizzes. Activity 3: Return to the programs and improve them in line with the ideas recorded on their worksheets. Test the programs as they work, and debug when necessary.	To help learners review their design from the previous lesson, it would be useful for them to receive feedback on their designs from Lesson 5. You will need to be familiar with the completed project. It might be useful for you to attempt to create the project, based on the task and a design, to identify with learners' experiences. In this lesson, learners will be working at the 'code' and 'running the code' levels of abstraction (LOA). More details on LOA are included in the unit overview.