Concept Progression for Computing Cycle B				
Key Concepts	**EYFS**	**Years 1 and 2**	**Years 3 and 4**	**Years 5 and 6**
Algorithms		**Moving a robot** Ch will think about the choices that are made when using information technology, and the responsibility associated with those choices. They will use IT in different types of activities and explain that sometimes they will need to use IT in different ways. Ch will think about the language used to give directions and how precise it needs to be. They will also work with a partner to give and follow instructions. These real-world activities should, at suitable points during this lesson, be related to the floor robot introduced in Lesson 1. Ch will decide what their program will do. They will then create their program and test it on the robot. Where needed, learners will also debug their program. Ch will decide what their program will do. They will then create their program and test it on the robot.		

		Where needed, learners will also debug their program. **Algorithms** Ch will use their project designs from the previous lesson to create their projects on-screen in ScratchJr. They will use their project design, including algorithms created in the previous lesson, to make programs for each of their rocket sprites. They will test whether their algorithms are effective when their programs are run.		
Computing systems		**IT around us** Ch will develop their understanding of what information technology (IT) is. They will identify devices that are computers and consider how IT can help them both at school and beyond. Ch will consider common uses of information technology in a context that they are familiar with. They will identify examples of IT and be able to explain the purpose of different examples of IT in the school setting.	**Data logging** Ch will build on the idea of collecting data over time, and be introduced to the idea of collecting data automatically using computers such as data loggers. They will also be introduced to the concept that computers can capture data from the physical world using input devices called 'sensors'. Ch will establish that sensors can be connected to data loggers, which can automatically collect data while not attached to a computer.	**Video Production** Ch will explore the capabilities of a digital device that can be used to record video. Once they are familiar with their device, learners will experiment with different camera angles, considering how different camera angles can be used for different purposes.

		Ch will begin to explore IT in environments beyond school, including home and familiar places such as shops. They will talk about the uses of IT in these environments and be able to explain that IT is used in many workplaces. Ch will explore the benefits of using IT in the wider world. They will focus on the use of IT in a shop and how devices can work together. Learners will sort activities based on whether they use IT or not and will be able to say why we use IT. Ch will consider how they use different forms of information technology safely, in a range of different environments. They will list different uses of IT and talk about the different rules that might be associated with using them. Learners will then say how rules can help keep them safe when using IT. Ch will think about the choices that are made when using information technology, and the responsibility associated with those choices. They will use IT in	Ch will explore how data loggers work. They will record data at set moments in time and draw parallels with the data points that a data logger captures at regular intervals. Ch will use data loggers away from a computer, then they will connect the loggers to a computer and download the data Ch will think about questions that can be answered using collected data. They will choose a question to focus on and then plan the data logging process that they need to complete. After ch have completed their plan, they will set up the data loggers to check that their plan will work. This setting up is designed to ensure that the data collection will work, and that learners will have data to use in the next lesson. Ch will access and review the data that they have collected using a data logger. They will then use the data collected to answer the question that they selected in the previous lesson. Ch will also reflect on the benefits of using a data logger.	

		different types of activities and explain that sometimes they will need to use IT in different ways		
Creating media		**Digital painting** Ch are introduced to the freehand tools available for digital painting. Ch use the line and shape tools and revisits the fill and undo tools used for digital painting. Learners create their own digital painting in the style of an artist. Ch understand of the available paint tools and encourages them to select the best tools to create a digital painting in the style of Wassily Kandinsky. Ch select appropriate colours, brush sizes, and brush tools to independently create their own image in the style of an artist. Ch select appropriate colours, brush sizes, and brush tools to independently create their own image in the style of an artist. Ch compare their preferences when creating	**The internet** Ch will analyse a website and identify the key parts. They will then consider what content can be added to websites and what factors they should consider before adding content to a website. Finally, they will use a website which enables them to create their own content online. **Stop frame animation** Ch will discuss whether they think a picture can move. They will learn about simple animation techniques and create their own animations in the style of flip books (flick books) using sticky notes. Ch they will develop this knowledge and apply it to make a stop-frame animation using a tablet. Ch will create a storyboard showing the characters, settings and events that they would like to include in their own stop-frame animation next week.	**Video Production** Ch will be introduced to video as a media format. They will see examples of videos featuring production and editing techniques that they will work towards using their own videos. Learners will begin by explaining what the medium of video is before analysing and comparing examples of videos. Ch will explore the capabilities of a digital device that can be used to record video. Once they are familiar with their device, learners will experiment with different camera angles, considering how different camera angles can be used for different purposes. Ch will use a storyboard to explore a variety of filming techniques, some of which they will use in their own video project later in the unit. They will evaluate the effectiveness of these techniques before

		paintings on computers and on paper. Making music Ch will listen to and compare two pieces of music from *The Planets* by Gustav Holst. They will then use a musical description word bank to describe how this music generates emotions, i.e. how it makes them feel. Chwill explore **rhythm**. They will create patterns and use those patterns as rhythms. They will use untuned percussion instruments and computers to hear the different rhythm patterns that they create. Ch will explore how music can be used in different ways to express emotions and to trigger their imaginations. They will experiment with the pitch of notes to create their own piece of music, which they will then associate with a physical object — in this case, an animal.	Ch will use tablets to carefully create stop-frame animations, paying attention to consistency. Ch will evaluate their animations and try to improve them by creating a brand-new animation based on their feedback. Ch will add other media and effects into their animations, such as music and text. **Photo editing** Introduce ch to the concept of editing images and discuss whether or not editing is ethical. They will go on to explore when we need to rotate and crop an image as well as how to use an image editor to make these changes. Ch will then discuss image composition. Ch will look at the effect that different colours and filters can have on an image. They will choose appropriate effects to fit a scenario, and explain how they made their choices. They will then edit the images using different effects to suit two different scenarios. Ch will be introduced to the cloning tool and its use in both changing the composition of a	offering feedback on others' work. Ch will plan a video by creating a storyboard. Their storyboard will describe each scene, and will include a script, camera angles, and filming techniques. Learners will use their storyboards to film the first scene of their videos. Ch will film the remaining scenes of their video, and then import their content to video editing software. They will then explore key editing techniques and decide whether sections of their video can be edited or need to be shot again. Ch will complete their video by removing unwanted content and reordering their clips. They will then export their finished video and evaluate the effectiveness of their edits. Finally, they will consider how they could share their video with others. **Introduction to spreadsheets** Ch will gain skills to create charts in Google Sheets. They will evaluate the results from their charts to answer

		Ch will develop their understanding of music. They will use a computer to create and refine musical patterns. Ch will choose an animal and create a piece of music using the animal as inspiration. They will think about their animal moving and create a rhythm pattern from that. Once they have defined a rhythm, they will create a musical pattern (melody) to go with it. Ch will retrieve and review their work. They will spend time making improvements and then share their work with the class.	photo and photo retouching. They will see how parts of a photo can be removed or duplicated using cloning. Learners will consider what parts of an image can be retouched and learn techniques to make this as unnoticeable as possible. Finally, they will consider when it is necessary to edit photographs in this way. Ch learn how to use different tools to select areas of an image. Ch then use copy and paste within one image and between two images to produce a combined image. Finally, ch will consider when it's appropriate to edit an image and discuss some of the ethics around retouching photos. Ch will apply all the skills they have learnt in the unit so far. They will start by reviewing some images and considering what makes an image look real or made up. Ch will then plan their own image. They will choose from a selection of images, open them and edit them to create their own project. Ch will review the image that they created in Lesson 5. After they have reviewed their	questions. Finally, ch will show they understand that there are different software tools available within spreadsheet applications to present data. **3d modelling** Ch will be introduced to the concept of 3D modelling by creating a range of 3D shapes that they select and move. Learners also examine shapes from a variety of views within the 3D space. Ch will manipulate 3D objects digitally. They will resize objects in one, two, and three dimensions. They will also lift and lower 3D objects relative to the workplane, and combine two 3D objects to make a new shape. Finally learners will recolour 3D objects. Ch will develop their understanding of manipulating digital 3D objects. They will rotate objects in three dimensions, duplicate objects, and then use grouping and ungrouping to manipulate many objects at once. They will combine

			image, they will have the opportunity to make changes to their image based on their review. Ch will then add text to their image to complete it as a publication.	these skills to create their own 3D name badge. Finally, learners will consider the practicality of 3D printing the objects they have made. Ch will be introduced to the dimensions of shapes in Tinkercad which will enable them to accurately resize and move shapes. Ch will then be introduced to placeholders which can be used to create holes in objects. Finally ch will duplicate, then resize multiple objects to create a meaningful 3D object.
Data and information		**Pictograms** Ch will begin to understand the importance of organising data effectively for counting and comparing. They will create their own tally charts to organise data, and represent the tally count as a total. Finally, they will answer questions comparing totals in tally charts using vocabulary such as 'more than' and 'less than'.	**Data logging** Ch will consider what data can be collected and how it is collected. They will think about data being collected over time. Ch will also think about questions that can and can't be answered using available data, and reflect on the importance of collecting the right data to answer questions. Ch will build on the idea of collecting data over time, and be introduced to the idea of	**Introduction to spreadsheets** Ch will collect and organise data in a format of their choice. They will then explore how data can be structured in a table. Finally they will input data into a spreadsheet. Ch will develop their understanding of the structure of a spreadsheet. They will be introduced to cell references, data items and the concept of formatting cells. Ch will see

		Ch will become familiar with the term 'pictogram'. They will create pictograms manually and then progress to creating them using a computer. Learners will begin to understand the advantages of using computers rather than manual methods to create pictograms, and use this to answer simple questions. Ch will think about the importance of effective data collection and will consider the benefits of different data collection methods: why, for example, we would use a pictogram to display the data collected. They will collect data to create a tally chart and use this to make a pictogram on a computer. Learners will explain what their finished pictogram shows by writing a range of statements to describe this. Ch will think about ways in which objects can be grouped by attribute. They will then tally objects using a common attribute and present the data in the form of a pictogram. Learners will	collecting data automatically using computers such as data loggers. They will also be introduced to the concept that computers can capture data from the physical world using input devices called 'sensors'. Ch will establish that sensors can be connected to data loggers, which can automatically collect data while not attached to a computer. Ch will explore how data loggers work. They will record data at set moments in time and draw parallels with the data points that a data logger captures at regular intervals. Ch will use data loggers away from a computer, then they will connect the loggers to a computer and download the data. Ch will open an existing data file and use software to find out key information. They will analyse a data file which shows hot water cooling over time. Ch will think about questions that can be answered using collected data. They will choose a question to focus on and then plan the data logging	data items formatted in different ways, they will then choose formats for data items before applying formats in their own spreadsheet. Ch will begin to use formulas to produce calculated data. They will understand that the type of data in a cell is important (e.g. numbers can be used in calculations whereas words cannot). Ch will create formulas to use in a spreadsheet using cell references and identify that changing inputs will change the output of the calculation. Ch will calculate data using the operations of multiplication, subtraction, division, and addition. They will use these operations to create formulas in a spreadsheet. ch will then begin to understand the importance of creating formulas that include a range of cells and the advantage of duplicating in order to apply formulas to multiple cells.

		answer questions based on their pictograms using mathematical vocabulary such as 'more than'/'less than' and 'most'/'least'. Ch will understand that people can be described by attributes. They will practise using attributes to describe images of people and the other learners in the class. The learners will collect data needed to organise people using attributes and create a pictogram to show this pictorially. Finally, learners will draw conclusions from their pictograms and share their findings. Ch will understand that there are other ways to present data than using tally charts and pictograms. They will use a pre-made tally chart to create a block diagram on their device. Learners will then share their data with a partner and discuss their findings. They will consider whether it is always OK to share data and when it is not OK. They will know that it is alright to say no if someone	process that they need to complete. After ch have completed their plan, they will set up the data loggers to check that their plan will work. This setting up is designed to ensure that the data collection will work, and that learners will have data to use in the next lesson. Ch will access and review the data that they have collected using a data logger. They will then use the data collected to answer the question that they selected in the previous lesson. Ch will also reflect on the benefits of using a data logger.	Ch will plan and calculate the cost of an event using a spreadsheet. They will use a predefined list to choose what they would like to include in their event, and use their spreadsheet to answer questions on the data they have selected. Ch will be reminded of the importance of organising data and will then create a spreadsheet using formulas to work out costs for their event. Ch will gain skills to create charts in Google Sheets. They will evaluate the results from their charts to answer questions. Finally, ch will show they understand that there are different software tools available within spreadsheet applications to present data.

		asks for their data, and how to report their concerns. Making Music Ch will explore how music can be used in different ways to express emotions and to trigger their imaginations. They will experiment with the pitch of notes to create their own piece of music, which they will then associate with a physical object — in this case, an animal. Ch will develop their understanding of music. They will use a computer to create and refine musical patterns.		
Design and development		**Digital painting** Ch understand of the available paint tools and encourages them to select the best tools to create a digital painting in the style of Wassily Kandinsky. Ch compare their preferences when creating paintings on computers and on paper. **Moving a robot**	**Stop frame animation** Ch will create a storyboard showing the characters, settings and events that they would like to include in their own stop-frame animation next week. Ch will use tablets to carefully create stop-frame animations, paying attention to consistency. Ch will evaluate their animations and try to improve them by creating a brand-new animation based on their feedback.	**Communication and collaboration** Ch use information provided in the lesson and their own prior knowledge to categorise different forms of internet communication. They then choose which method(s) they would use for the scenarios discussed in the previous lesson. Through these activities, learners explore issues around privacy, information security and how

		Ch will decide what their program will do. They will then create their program and test it on the robot. Where needed, learners will also debug their program. Making Music Ch will choose an animal and create a piece of music using the animal as inspiration. They will think about their animal moving and create a rhythm pattern from that. Once they have defined a rhythm, they will create a musical pattern (melody) to go with it. **Programming animations** Ch will choose appropriate backgrounds and sprites for a 'Space race' project. They will decide how each sprite will move, and create an algorithm based on the blocks available in ScratchJr that reflects this Ch will use their project designs from the previous lesson to create their projects on-screen in ScratchJr. They will use their project design, including algorithms created	Ch will add other media and effects into their animations, such as music and text. Photo editing Ch will be introduced to the cloning tool and its use in both changing the composition of a photo and photo retouching. They will see how parts of a photo can be removed or duplicated using cloning. Ch will consider what parts of an image can be retouched and learn techniques to make this as unnoticeable as possible. Finally, they will consider when it is necessary to edit photographs in this way. Ch will review the image that they created in Lesson 5. After they have reviewed their image, they will have the opportunity to make changes to their image based on their review. Learners will then add text to their image to complete it as a publication. Events and actions in programming Ch explore the process of debugging, specifically looking at how to identify and fix errors	to report concerns about inappropriate content online. **Video Production** Ch will be introduced to video as a media format. They will see examples of videos featuring production and editing techniques that they will work towards using their own videos. Learners will begin by explaining what the medium of video is before analysing and comparing examples of videos. Ch will plan a video by creating a storyboard. Their storyboard will describe each scene, and will include a script, camera angles, and filming techniques. Learners will use their storyboards to film the first scene of their videos. Ch will complete their video by removing unwanted content and reordering their clips. They will then export their finished video and evaluate the effectiveness of their edits. Finally, they will consider how they could share their video with others.

		in the previous lesson, to make programs for each of their rocket sprites. They will test whether their algorithms are effective when their programs are run.	in a program. Ch will review an existing project against a given design and identify bugs within it. They will then correct the errors, gaining independence as they do so. Ch will also develop their projects by considering which new setup blocks to use. Ch will design and create their own projects. Using a template (which can be blank or partially completed), ch will complete projects to move a sprite around a maze, with the option to leave a pen trail showing where the sprite has moved. Ideally, projects will include setup blocks to position the sprite at the start of the maze and clear any lines already on the screen.	
Effective use of tools		**Digital painting** Ch are introduced to the freehand tools available for digital painting. Ch use the line and shape tools and revisits the fill and undo tools used for digital painting. Learners create their own digital painting in the style of an artist.	**Stop frame animation** Ch will discuss whether they think a picture can move. They will learn about simple animation techniques and create their own animations in the style of flip books (flick books) using sticky notes. Ch they will develop this knowledge and apply it to	**Communication and collaboration** Ch explore what is necessary for effective communication and the importance of agreed protocols. They apply this understanding to IP addresses and the rules (protocols) that computers have for communicating with one another. Learners also use

		Ch understand of the available paint tools and encourages them to select the best tools to create a digital painting in the style of Wassily Kandinsky. Ch select appropriate colours, brush sizes, and brush tools to independently create their own image in the style of an artist. Ch compare their preferences when creating paintings on computers and on paper. **Pictograms** Ch will become familiar with the term 'pictogram'. They will create pictograms manually and then progress to creating them using a computer. Learners will begin to understand the advantages of using computers rather than manual methods to create pictograms, and use this to answer simple questions. Ch will think about the importance of effective data collection and will consider the benefits of different data collection methods: why, for	make a stop-frame animation using a tablet. Ch will use tablets to carefully create stop-frame animations, paying attention to consistency. Ch will evaluate their animations and try to improve them by creating a brand-new animation based on their feedback. Ch will add other media and effects into their animations, such as music and text. **Sequencing sounds** Ch introduces learners to a new programming environment: Scratch. Learners will begin by comparing Scratch to other programming environments they may have experienced, before familiarising themselves with the basic layout of the screen. Programming animations Ch will build on the idea of collecting data over time, and be introduced to the idea of collecting data automatically using computers such as data loggers. They will also be introduced to the concept that computers can capture data	a Domain Name Server (DNS) to translate web addresses into IP addresses. Ch are introduced to the concept of packets. They complete an activity based on transferring an image across the internet, to see that as well as messages (text), other types of data (images, video, and audio) are also transferred over the internet. They gain an understanding of the key parts of a packet: the header and the data payload. Ch consider how people can work together when they are not in the same location. They discuss ways of working and complete a collaborative online project. The online activity assumes that learners can make simple slides, including text and images. If your learners are unsure how to do this, you may wish to spend some time on the Year 3 – 'Desktop publishing' unit before this lesson. Ch are introduced to another approach to online working: reusing and modifying work done by someone else. (**Note:**

		example, we would use a pictogram to display the data collected. They will collect data to create a tally chart and use this to make a pictogram on a computer. Learners will explain what their finished pictogram shows by writing a range of statements to describe this. Ch will think about ways in which objects can be grouped by attribute. They will then tally objects using a common attribute and present the data in the form of a pictogram. Learners will answer questions based on their pictograms using mathematical vocabulary such as 'more than'/'less than' and 'most'/'least'. Ch will understand that people can be described by attributes. They will practise using attributes to describe images of people and the other learners in the class. The learners will collect data needed to organise people using attributes and create a pictogram to show this pictorially. Finally, learners will draw conclusions from their	from the physical world using input devices called 'sensors'. Ch will establish that sensors can be connected to data loggers, which can automatically collect data while not attached to a computer. Ch will explore how data loggers work. They will record data at set moments in time and draw parallels with the data points that a data logger captures at regular intervals. Ch will use data loggers away from a computer, then they will connect the loggers to a computer and download the data Ch will open an existing data file and use software to find out key information. They will analyse a data file which shows hot water cooling over time. Ch will think about questions that can be answered using collected data. They will choose a question to focus on and then plan the data logging process that they need to complete. After ch have completed their plan, they will set up the data loggers to	Using someone else's work needs to be within the bounds of copyright and with the relevant permissions.) This lesson involves the Scratch programming tool, which allows learners to use other people's work. Ch deepen their understanding of the term 'communication'. They explore different methods of communication, before they consider internet-based communication in more detail. Finally, learners evaluate which methods of communication suit particular purposes. Ch use information provided in the lesson and their own prior knowledge to categorise different forms of internet communication. They then choose which method(s) they would use for the scenarios discussed in the previous lesson. Through these activities, learners explore issues around privacy, information security and how to report concerns about inappropriate content online.

		pictograms and share their findings. Ch will understand that there are other ways to present data than using tally charts and pictograms. They will use a pre-made tally chart to create a block diagram on their device. Learners will then share their data with a partner and discuss their findings. They will consider whether it is always OK to share data and when it is not OK. They will know that it is alright to say no if someone asks for their data, and how to report their concerns. Making Music Ch will choose an animal and create a piece of music using the animal as inspiration. They will think about their animal moving and create a rhythm pattern from that. Once they have defined a rhythm, they will create a musical pattern (melody) to go with it. Ch will retrieve and review their work. They will spend time making improvements	check that their plan will work. This setting up is designed to ensure that the data collection will work, and that learners will have data to use in the next lesson. **Photo editing** Introduce ch to the concept of editing images and discuss whether or not editing is ethical. They will go on to explore when we need to rotate and crop an image as well as how to use an image editor to make these changes. Ch will then discuss image composition. Ch will look at the effect that different colours and filters can have on an image. They will choose appropriate effects to fit a scenario, and explain how they made their choices. They will then edit the images using different effects to suit two different scenarios. Ch will be introduced to the cloning tool and its use in both changing the composition of a photo and photo retouching. They will see how parts of a photo can be removed or duplicated using cloning. Learners will consider what parts	**Video Production** Ch will plan a video by creating a storyboard. Their storyboard will describe each scene, and will include a script, camera angles, and filming techniques. Learners will use their storyboards to film the first scene of their videos. Ch will film the remaining scenes of their video, and then import their content to video editing software. They will then explore key editing techniques and decide whether sections of their video can be edited or need to be shot again. Ch will complete their video by removing unwanted content and reordering their clips. They will then export their finished video and evaluate the effectiveness of their edits. Finally, they will consider how they could share their video with others. **Introduction to spreadsheets** Ch will begin to use formulas to produce calculated data. They will understand that the type of data in a cell is

		and then share their work with the class.	of an image can be retouched and learn techniques to make this as unnoticeable as possible. Finally, they will consider when it is necessary to edit photographs in this way. Ch learn how to use different tools to select areas of an image. Ch then use copy and paste within one image and between two images to produce a combined image. Finally, ch will consider when it's appropriate to edit an image and discuss some of the ethics around retouching photos. Ch will apply all the skills they have learnt in the unit so far. They will start by reviewing some images and considering what makes an image look real or made up. Ch will then plan their own image. They will choose from a selection of images, open them and edit them to create their own project. Ch will review the image that they created in Lesson 5. After they have reviewed their image, they will have the opportunity to make changes to their image based on their review. Ch will then add text to	important (e.g. numbers can be used in calculations whereas words cannot). Ch will create formulas to use in a spreadsheet using cell references and identify that changing inputs will change the output of the calculation. Ch will calculate data using the operations of multiplication, subtraction, division, and addition. They will use these operations to create formulas in a spreadsheet. Ch will then begin to understand the importance of creating formulas that include a range of cells and the advantage of duplicating in order to apply formulas to multiple cells. Ch will plan and calculate the cost of an event using a spreadsheet. They will use a predefined list to choose what they would like to include in their event, and use their spreadsheet to answer questions on the data they have selected. Ch will be

			their image to complete it as a publication. **Events and actions in programming** Ch will investigate how characters can be moved using 'events'. They will analyse and improve an existing project, and then apply what they have learned to their own projects. They will then extend their learning to control multiple sprites in the same project. Ch will program a sprite to move in four directions: up, down, left, and right. They will begin by choosing a sprite and sizing it to fit in with a given background. Ch will then create the code to move the sprite in one direction before duplicating and modifying it to move in all four directions. Finally, they will consider how their project could be extended to prove that their sprite has successfully navigated a maze.	reminded of the importance of organising data and will then create a spreadsheet using formulas to work out costs for their event. Ch will gain skills to create charts in Google Sheets. They will evaluate the results from their charts to answer questions. Finally, ch will show they understand that there are different software tools available within spreadsheet applications to present data. **3d modelling** Ch will be introduced to the concept of 3D modelling by creating a range of 3D shapes that they select and move. Learners also examine shapes from a variety of views within the 3D space. Ch will manipulate 3D objects digitally. They will resize objects in one, two, and three dimensions. They will also lift and lower 3D objects relative to the workplane, and combine two 3D objects to make a new shape. Finally

				learners will recolour 3D objects. Ch will develop their understanding of manipulating digital 3D objects. They will rotate objects in three dimensions, duplicate objects, and then use grouping and ungrouping to manipulate many objects at once. They will combine these skills to create their own 3D name badge. Finally, learners will consider the practicality of 3D printing the objects they have made.
Networks		**IT around us** Ch will develop their understanding of what information technology (IT) is. They will identify devices that are computers and consider how IT can help them both at school and beyond. Ch will consider common uses of information technology in a context that they are familiar with. They will identify examples of IT and be able to explain the purpose of different	**The internet** Ch will explore how a network can share messages with another network to form the internet. They will consider some of the network devices involved in this, such as routers, and will also discuss what should be kept in and out of a network to keep safe. Ch will describe the parts of a network and how they connect to each other to form the internet. They will use this understanding to help explain	**Communication and collaboration** Ch explore what is necessary for effective communication and the importance of agreed protocols. They apply this understanding to IP addresses and the rules (protocols) that computers have for communicating with one another. Learners also use a Domain Name Server (DNS) to translate web addresses into IP addresses.

		examples of IT in the school setting. Ch will begin to explore IT in environments beyond school, including home and familiar places such as shops. They will talk about the uses of IT in these environments and be able to explain that IT is used in many workplaces. Ch will explore the benefits of using IT in the wider world. They will focus on the use of IT in a shop and how devices can work together. Learners will sort activities based on whether they use IT or not and will be able to say why we use IT. Ch will consider how they use different forms of information technology safely, in a range of different environments. They will list different uses of IT and talk about the different rules that might be associated with using them. Learners will then say how rules can help keep them safe when using IT. Ch will think about the choices that are made when using information technology, and the responsibility	how the internet lets us view the World Wide Web and recognise that the World Wide Web is part of the internet which contains websites and web pages. Ch will explore what can be shared on the World Wide Web and where websites are stored. They will also explore how the World Wide Web can be accessed on a variety of devices. Ch will analyse a website and identify the key parts. They will then consider what content can be added to websites and what factors they should consider before adding content to a website. Finally, they will use a website which enables them to create their own content online. Ch will explore who owns the content on the World Wide Web (or 'web' for short). They will explore a variety of websites and will investigate what they can and cannot do with the content on them. They will also relate this to principles of ownership and sharing in the real world. Ch will gain an appreciation of the fact that not everything	Ch are introduced to the concept of packets. They complete an activity based on transferring an image across the internet, to see that as well as messages (text), other types of data (images, video, and audio) are also transferred over the internet. They gain an understanding of the key parts of a packet: the header and the data payload. Ch consider how people can work together when they are not in the same location. They discuss ways of working and complete a collaborative online project. The online activity assumes that learners can make simple slides, including text and images. If your learners are unsure how to do this, you may wish to spend some time on the Year 3 – 'Desktop publishing' unit before this lesson. Ch are introduced to another approach to online working: reusing and modifying work done by someone else. (**Note:** Using someone else's work needs to be within the bounds of copyright and with the

		associated with those choices. They will use IT in different types of activities and explain that sometimes they will need to use IT in different ways	they see on the internet is true, honest, or accurate. They will review images and decide whether or not they are real, before looking at why web searches can return ambiguous (and sometimes misleading) results. Finally, learners will complete a practical activity, demonstrating how quickly information can spread beyond their control.	relevant permissions.) This lesson involves the Scratch programming tool, which allows learners to use other people's work. Ch deepen their understanding of the term 'communication'. They explore different methods of communication, before they consider internet-based communication in more detail. Finally, learners evaluate which methods of communication suit particular purposes. Ch use information provided in the lesson and their own prior knowledge to categorise different forms of internet communication. They then choose which method(s) they would use for the scenarios discussed in the previous lesson. Through these activities, learners explore issues around privacy, information security and how to report concerns about inappropriate content online.
Impact of technology		**IT around us** Ch consider common uses of information technology in a	**The internet** Ch will gain an appreciation of the fact that not everything	**Communication and collaboration**

		context that they are familiar with. They will identify examples of IT and be able to explain the purpose of different examples of IT in the school setting. Ch will begin to explore IT in environments beyond school, including home and familiar places such as shops. They will talk about the uses of IT in these environments and be able to explain that IT is used in many workplaces. Ch will explore the benefits of using IT in the wider world. They will focus on the use of IT in a shop and how devices can work together. Learners will sort activities based on whether they use IT or not and will be able to say why we use IT. Ch will think about the choices that are made when using information technology, and the responsibility associated with those choices. They will use IT in different types of activities and explain that sometimes they will need to use IT in different ways. **Moving a robot**	they see on the internet is true, honest, or accurate. They will review images and decide whether or not they are real, before looking at why web searches can return ambiguous (and sometimes misleading) results. Finally, learners will complete a practical activity, demonstrating how quickly information can spread beyond their control. **Photo editing** Ch will look at the effect that different colours and filters can have on an image. They will choose appropriate effects to fit a scenario, and explain how they made their choices. They will then edit the images using different effects to suit two different scenarios.	Ch are introduced to another approach to online working: reusing and modifying work done by someone else. (**Note:** Using someone else's work needs to be within the bounds of copyright and with the relevant permissions.) This lesson involves the Scratch programming tool, which allows learners to use other people's work.

		Ch will think about the language used to give directions and how precise it needs to be. They will also work with a partner to give and follow instructions. These real-world activities should, at suitable points during this lesson, be related to the floor robot introduced in Lesson 1.		
Programming		**Moving a robot** Ch will focus on programming the floor robot to move forwards and backwards. They will see that the robot moves forwards and backwards a fixed distance. This highlights the idea that robots follow a clear, fixed command in a precise and repeatable way. Learners will think about starting the robot from the same place each time. Using the same starting position with fixed commands will allow learners to predict what a program will do. Ch will use 'left turn' and 'right turn' commands along with 'forwards' and 'backwards' commands. Doing this will allow learners to develop slightly more	**Sequencing sounds** Ch introduces learners to a new programming environment: Scratch. Learners will begin by comparing Scratch to other programming environments they may have experienced, before familiarising themselves with the basic layout of the screen. Ch will create movement for more than one sprite. In doing this, they will design and implement their code, and then will create code to replicate a given outcome. Finally, they will experiment with new motion blocks. Ch will be introduced to the concept of sequences by joining blocks of code together. They will also learn how event blocks can be used to start a project in a variety of different	Introduction to spreadsheets Ch will begin to use formulas to produce calculated data. They will understand that the type of data in a cell is important (e.g. numbers can be used in calculations whereas words cannot). Ch will create formulas to use in a spreadsheet using cell references and identify that changing inputs will change the output of the calculation. Ch will calculate data using the operations of multiplication, subtraction, division, and addition. They will use these operations to create formulas in a spreadsheet. Ch will then begin to understand the importance of creating formulas that include a range

		complex programs. Learners will create their programs in this lesson through trial and error, before moving on to planning out their programs in Lesson 5. In Activity 3, learners will predict where given programs will move the robot to. Learners will make their predictions by looking at the commands and matching the program steps to movements. **Programming animations** Ch will become accustomed to the ScratchJr programming environment. They will discover that they can move characters on-screen using commands, and compare ScratchJr to the Bee-Bots used in the previous unit. Ch learners will discover that blocks can be joined together in ScratchJr. They will use a **Start** block to run their programs. They will also learn additional skills such as adding backgrounds and deleting sprites. Learners will	ways. In doing this, they will apply principles of design to plan and create a project. **Events and actions in programs** Ch will investigate how characters can be moved using 'events'. They will analyse and improve an existing project, and then apply what they have learned to their own projects. They will then extend their learning to control multiple sprites in the same project. Ch will program a sprite to move in four directions: up, down, left, and right. They will begin by choosing a sprite and sizing it to fit in with a given background. Ch will then create the code to move the sprite in one direction before duplicating and modifying it to move in all four directions. Finally, they will consider how their project could be extended to prove that their sprite has successfully navigated a maze. Introduce ch to extension blocks in Scratch using the **Pen** extension. Ch will use the pen down block to draw lines, building on the movement they created for their sprite in Lesson 2. Ch will then	of cells and the advantage of duplicating in order to apply formulas to multiple cells.

		follow given algorithms to create simple programs. Ch will discover that some blocks in ScratchJr have numbers underneath them. They will learn how to change these values and identify the effect on a block of changing a value. Ch will be taught how to add and delete sprites in ScratchJr. They will discover that each sprite has its own programming area, and learn how to add programming blocks to give instructions to each of the sprites. Ch will choose appropriate backgrounds and sprites for a 'Space race' project. They will decide how each sprite will move, and create an algorithm based on the blocks available in ScratchJr that reflects this Ch will use their project designs from the previous lesson to create their projects on-screen in ScratchJr. They will use their project design, including algorithms created in the previous lesson, to	decide how to set up their project every time it is run. Ch will be given the opportunity to use additional **Pen** blocks. They will predict the functions of new blocks and experiment with them, before designing features to add to their own projects. Finally, they will add these features to their projects and test their effectiveness. Ch explorethe process of debugging, specifically looking at how to identify and fix errors in a program. Ch will review an existing project against a given design and identify bugs within it. They will then correct the errors, gaining independence as they do so. Ch will also develop their projects by considering which new setup blocks to use. Ch will design and create their own projects. Using a template (which can be blank or partially completed), learners will complete projects to move a sprite around a maze, with the option to leave a pen trail showing where the sprite has moved. Ideally, projects will include setup blocks to position the sprite at the start of the maze and clear any lines already on the screen.	

		make programs for each of their rocket sprites. They will test whether their algorithms are effective when their programs are run.		
Safety and security		**IT around us** Ch will develop their understanding of what information technology (IT) is. They will identify devices that are computers and consider how IT can help them both at school and beyond. Ch will consider how they use different forms of information technology safely, in a range of different environments. They will list different uses of IT and talk about the different rules that might be associated with using them. Learners will then say how rules can help keep them safe when using IT. Ch will think about the choices that are made when using information technology, and the responsibility associated with those choices. They will use IT in different types of activities and explain that sometimes they will need to use IT in different ways.	**The internet** Ch will explore how a network can share messages with another network to form the internet. They will consider some of the network devices involved in this, such as routers, and will also discuss what should be kept in and out of a network to keep safe. Ch will gain an appreciation of the fact that not everything they see on the internet is true, honest, or accurate. They will review images and decide whether or not they are real, before looking at why web searches can return ambiguous (and sometimes misleading) results. Finally, learners will complete a practical activity, demonstrating how quickly information can spread beyond their control. **Photo editing** Ch will apply all the skills they have learnt in the unit so far. They will start by reviewing some images	**Video Production** Ch will use a storyboard to explore a variety of filming techniques, some of which they will use in their own video project later in the unit. They will evaluate the effectiveness of these techniques before offering feedback on others' work.

		Pictograms Ch will understand that there are other ways to present data than using tally charts and pictograms. They will use a pre-made tally chart to create a block diagram on their device. Learners will then share their data with a partner and discuss their findings. They will consider whether it is always OK to share data and when it is not OK. They will know that it is alright to say no if someone asks for their data, and how to report their concerns.	and considering what makes an image look real or made up. Ch will then plan their own image. They will choose from a selection of images, open them and edit them to create their own project.	