Year 2 – Information technology around us

Unit introduction

Learners will develop their understanding of what information technology (IT) is and will begin to identify examples. They will discuss where they have seen IT in school and beyond, in settings such as shops, hospitals, and libraries. Learners will then investigate how IT improves our world, and they will learn about the importance of using IT responsibly.

Overview of lessons

Lesson	Brief overview	Learning objectives
1 What is IT?	Learners 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.	To recognise the uses and features of information technology • I can identify examples of computers • I can describe some uses of computers • I can identify that a computer is a part of IT
2 IT in school	Learners 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.	To identify the uses of information technology in the school • I can identify examples of IT • I can sort school IT by what it's used for • I can identify that some IT can be used in more than one way
3 IT in the world	Learners 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	To identify information technology beyond school • I can find examples of information technology • I can sort IT by where it is found

	explain that IT is used in many workplaces.	• I can talk about uses of information technology
4 The benefits of IT	Learners 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.	To explain how information technology helps us • I can recognise common types of technology • I can demonstrate how IT devices work together • I can say why we use IT
5 Using IT safely	Learners 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.	To explain how to use information technology safely • I can list different uses of information technology • I can talk about different rules for using IT • I can say how rules can help keep me safe
6 Using IT in different ways	Learners 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.	To recognise that choices are made when using information technology • I can identify the choices that I make when using IT • I can use IT for different types of activities • I can explain the need to use IT in different ways

Progression

This unit progresses learners' understanding of technology and how they interact with it. They will develop this understanding to become familiar with the term information technology and will be able to identify common features of IT. This unit also builds on the learners' understanding of using technology safely and responsibly.

Curriculum links

National curriculum links

- Use technology purposefully to create, organise, store, manipulate, and retrieve digital content
- Recognise common uses of information technology beyond school
- Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

Education for a Connected World links

Health, well-being, and lifestyle

- I can identify rules that help keep us safe and healthy in and beyond the home when using technology
- I can give some simple examples

Year 2 – Digital photography

Unit introduction

Learners will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, they will use this knowledge to recognise that images they see may not be real.

Overview of lessons

Lesson	Brief overview	Learning objectives
1 Taking photographs	This lesson introduces the concept that many devices can be used to take photographs. In the lesson, learners begin to capture their own photographs.	To use a digital device to take a photograph • I can recognise what devices can be used to take photographs • I can talk about how to take a photograph • I can explain what I did to capture a digital photo
2 Landscape or portrait?	A photograph can be taken in either portrait or landscape format. In this lesson, learners explore taking photographs in both portrait and landscape formats and explore the reasons why a photographer may favour one over the other.	To make choices when taking a photograph • I can explain the process of taking a good photograph • I can take photos in both landscape and portrait format • I can explain why a photo looks better in portrait or landscape format
3 What makes a good photograph?	A photograph is composed by a photographer. In this lesson, learners discover what constitutes good photography composition and put this into practice by composing and capturing photos of their own.	To describe what makes a good photograph • I can identify what is wrong with a photograph • I can discuss how to take a good photograph • I can improve a photograph by retaking it

4 Lighting	This lesson introduces the concepts of light and focus as further important aspects of good photography composition. In this lesson, learners investigate the effect that good lighting has on the quality of the photos they take, and explore what effect using the camera flash and adding an artificial light source have on their photos. They also learn how the camera autofocus tool can be used to make an object in an image stand out.	To decide how photographs can be improved • I can explore the effect that light has on a photo • I can experiment with different light sources • I can explain why a picture may be unclear
5 Effects	This lesson introduces the concept of simple image editing. Learners are introduced to the Pixlr image editing software and use the 'Adjust' tool to change the colour effect of an image.	To use tools to change an image • I can recognise that images can be changed • I can use a tool to achieve a desired effect • I can explain my choices
6 Is it real?	This lesson introduces the concept that images can be changed for a purpose. Learners are introduced to a range of images that have been changed in different ways and through this, develop an awareness that not all images they see are real. To start the lesson, learners are first challenged to take their best photograph by applying the photography composition skills that they have developed during the unit.	To recognise that photos can be changed • I can apply a range of photography skills to capture a photo • I can recognise which photos have been changed • I can identify which photos are real and which have been changed

Progression

This unit begins the learners' understanding of how photos are captured and can be manipulated for different purposes. Following this unit, learners will develop their photo editing skills in Year 4.

Curriculum links

National curriculum computing links
Computing

- Use technology purposefully to create, organise, store, manipulate, and retrieve digital content
- Recognise common uses of information technology beyond school
- Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

Further national curriculum links
Art and design

- To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form, and space

Education for a Connected World links

- To identify that some images are not real (fake)

Year 2 – Making music

Unit introduction

In this unit, learners will be using a computer to create music. They will listen to a variety of pieces of music and consider how music can make them think and feel. Learners will compare creating music digitally and non-digitally. Learners will look at patterns and purposefully create music.

Overview of lessons

Lesson	Brief overview	Learning objectives
1 How music makes us feel	In this lesson learners 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.	To say how music can make us feel • I can identify simple differences in pieces of music • I can describe music using adjectives • I can say what I do and don't like about a piece of music
2 Rhythms and patterns	In this lesson, learners will 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.	To identify that there are patterns in music • I can create a rhythm pattern • I can play an instrument following a rhythm pattern • I can explain that music is created and played by humans
3 How music can be used	During this lesson, learners 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.	To experiment with sound using a computer • I can connect images with sounds • I can use a computer to experiment with pitch • I can relate an idea to a piece of music
4 Notes and tempo	In this lesson, learners will develop their understanding of music. They will use a	To use a computer to create a musical pattern

	computer to create and refine musical patterns.	• I can identify that music is a sequence of notes • I can explain how my music can be played in different ways • I can refine my musical pattern on a computer
5 Creating digital music	In this lesson, learners 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.	To create music for a purpose • I can create a rhythm which represents an animal I've chosen • I can create my animal's rhythm on a computer • I can add a sequence of notes to my rhythm
6 Reviewing and editing music	In this lesson, learners will retrieve and review their work. They will spend time making improvements and then share their work with the class.	To review and refine our computer work • I can review my work • I can explain how I changed my work • I can listen to music and describe how it makes me feel

Progression

Learners should have experience of making choices on a tablet/computer, and they should be able to navigate within an application. Learners should also have some experience of patterns.

This unit progresses students' knowledge through listening to music and considering how music can affect how we think and feel. Learners will then purposefully create rhythm patterns and music.

Curriculum links

Computing national curriculum links

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

Music national curriculum links

- Play tuned and untuned instruments musically
- Listen with concentration and understanding to a range of high-quality live and recorded music
- Experiment with, create, select, and combine sounds using the interrelated dimensions of music

Education for a Connected World links

Copyright and ownership

- I know that work I create belongs to me.

Year 2 – Pictograms

Unit introduction

Learners will begin to understand what the term data means and how data can be collected in the form of a tally chart. They will learn the term 'attribute' and use this to help them organise data. They will then progress onto presenting data in the form of pictograms and finally block diagrams. Learners will use the data presented to answer questions.

During this unit of work learners will use j2e pictogram tool which can be accessed online using a desktop, laptop or tablet computer. Your school may have access to an equivalent alternative which could be used instead.

Overview of lessons

Lesson	Brief overview	Learning objectives
1 Counting and comparing	During this lesson learners 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'.	To recognise that we can count and compare objects using tally charts • I can record data in a tally chart • I can represent a tally count as a total • I can compare totals in a tally chart
2 Enter the data	During this lesson learners 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.	To recognise that objects can be represented as pictures • I can enter data onto a computer • I can use a computer to view data in a different format • I can use pictograms to answer simple questions about objects
3 Creating pictograms	During this lesson learners 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	To create a pictogram • I can organise data in a tally chart • I can use a tally chart to create a pictogram

	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.	• I can explain what the pictogram shows
4 What is an attribute?	During this lesson learners 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'.	To select objects by attribute and make comparisons • I can tally objects using a common attribute • I can create a pictogram to arrange objects by an attribute • I can answer 'more than'/'less than' and 'most/least' questions about an attribute
5 Comparing people	During this lesson learners 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.	To recognise that people can be described by attributes • I can choose a suitable attribute to compare people • I can collect the data I need • I can create a pictogram and draw conclusions from it
6 Presenting information	During this lesson learners 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	To explain that we can present information using a computer • I can use a computer program to present information in different ways • I can share what I have found out using a computer • I can give simple

	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.	examples of why information should not be shared

Progression

This unit progresses students' knowledge and understanding of grouping data. It builds on the Year 1 Data and Information unit where learners labelled objects and grouped them based on different properties. In Year 3 learners develop their understanding of attributes (properties) using branching databases to structure data according to different object attributes.

Curriculum links

National curriculum links

Computing

- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

Maths

Building on Year 1 number and place value:

- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: 'equal to', 'more than', 'less than' ('fewer'), 'most', 'least'

Year 2

- interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- ask and answer questions about totalling and comparing categorical data

Notes and guidance: Pupils record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10).

Education for a Connected World links

Self image and identity

- I can recognise that I can say 'no'/'please stop'/'I'll tell'/'I'll ask' to somebody who asks me to do something that makes me feel sad, embarrassed or upset
- I can explain how this could be either in real life or online

- If something happens that makes me feel sad, worried, uncomfortable, or frightened I can give examples of when and how to speak to an adult I can trust

Health, wellbeing and lifestyle

- I can identify rules that help keep us safe and healthy in and beyond the home when using technology
- I can give some simple examples

Privacy and security

- I can identify some simple examples of my personal information (e.g. name, address, birthday, age, location)
- I can describe the people I can trust and can share this with; I can explain why I can trust them
- I can recognise more detailed examples of information that is personal to me (e.g. where I live, my family's names, where I go to school)

Year 2 – Programming A – Robot algorithms

Unit introduction

This unit develops learners' understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Learners will use given commands in different orders to investigate how the order affects the outcome. They will also learn about design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them.

This unit includes references relating to Bee-Bot and Blue-Bot floor robots, however, other educational floor robots are available. Learners should be given access to a device with a limited range of functions that is designed for young learners. Before delivering this unit, ensure that you are familiar with your school's floor robots, including charging or battery requirements. You should also know how to switch the devices on and off, as well as key functions such as clearing the memory. It is advisable to use the robots on the floor if possible, as this can reduce damage caused by dropping.

Overview of lessons

Lesson	**Brief overview**	**Learning objectives**
1 Giving instructions	Learners will follow instructions given to them and give instructions to others. They will consider the language used to give instructions, and how that language needs to be clear and precise. Learners will combine several instructions into a sequence that can then be issued to another learner to complete. They will then consider a clear and precise set of instructions in relation to an algorithm, and will think about how computers can only follow clear and unambiguous instructions.	To describe a series of instructions as a sequence • I can follow instructions given by someone else • I can choose a series of words that can be acted out as a sequence • I can give clear instructions
2 Same but different	Learners will focus on sequences, and consider the importance of the order of instructions within a sequence. They will create sequences using the same instructions in different orders. They will then test these sequences to see how	To explain what happens when we change the order of instructions • I can use the same instructions to create different algorithms • I can use an algorithm to

	the different orders affect the outcome.	program a sequence on a floor robot • I can show the difference in outcomes between two sequences that consist of the same instructions
3 Making predictions	Learners will use logical reasoning to make predictions. They will follow a program step by step and identify what the outcome will be. **Note:** Learners may need to be encouraged to think through their predictions and understand that they are reasoned decisions rather than guesses.	To use logical reasoning to predict the outcome of a program • I can follow a sequence • I can predict the outcome of a sequence • I can compare my prediction to the program outcome
4 Mats and routes	Learners will design, create, and test a mat for a floor robot. This will introduce the idea that design in programming not only includes code and algorithms, but also artefacts related to the project, such as artwork. **Note:** The designs in this lesson can be changed to suit a topic or theme that the class is learning about. The ideas included in the slides are examples.	To explain that programming projects can have code and artwork • I can explain the choices that I made for my mat design • I can identify different routes around my mat • I can test my mat to make sure that it is usable
5 Algorithm design	Learners will design an algorithm to move their robot around the mat that they designed in Lesson 4. As part of the design process, learners will outline what their task is by identifying the starting and finishing points of a route. This outlining will ensure that learners clearly understand what they want their program to achieve.	To design an algorithm • I can explain what my algorithm should achieve • I can create an algorithm to meet my goal • I can use my algorithm to create a program

6 Break it down	Learners will take on a larger programming task. They will break the task into chunks and create algorithms for each chunk. This process is known as 'decomposition' and is covered further in key stage 2. Learners will also find and fix errors in their algorithms and programs. They will understand this process to be 'debugging'.	To create and debug a program that I have written • I can test and debug each part of the program • I can plan algorithms for different parts of a task • I can put together the different parts of my program

Progression

In advance of the lessons in this Year 2 unit, learners should have had some experience of creating short programs using floor robots and predicting the outcome of a simple program. This unit progresses learners' knowledge and understanding of algorithms and how they are implemented as programs on digital devices. Learners will spend time looking at how the order of commands affects outcomes. Learners will use this knowledge and logical reasoning to trace programs and predict outcomes.

Curriculum links

National curriculum links

- Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- Create and debug simple programs
- Use logical reasoning to predict the behaviour of simple programs

Year 2 – Programming quizzes

Unit introduction

This unit initially recaps on learning from the Year 1 ScratchJr unit 'Programming B – Programming animations'. Learners begin to understand that sequences of commands have an outcome, and make predictions based on their learning. They use and modify designs to create their own quiz questions in ScratchJr, and realise these designs in ScratchJr using blocks of code. Finally, learners evaluate their work and make improvements to their programming projects.

Overview of lessons

Lesson	Brief overview	Learning objectives
ScratchJr recap	During this lesson, learners will recap what they know already about the ScratchJr app. They will begin to identify the start of sequences in real-world scenarios, and learn that sequences need to be started in ScratchJr. Learners will create programs and run them in full-screen mode using the **Green flag**.	To explain that a sequence of commands has a start • I can identify the start of a sequence • I can identify that a program needs to be started • I can show how to run my program
Outcomes	During this lesson, learners will discover that a sequence of commands has an 'outcome'. They will predict the outcomes of real-life scenarios and a range of small programs in ScratchJr. Learners will then match programs that produce the same outcome when run, and use a set of blocks to create programs that produce different outcomes when run.	To explain that a sequence of commands has an outcome • I can predict the outcome of a sequence of commands • I can match two sequences with the same outcome • I can change the outcome of a sequence of commands
Using a design	During this lesson, learners will be taught how to use the **Start on tap** and **Go to page** (**Change background**) blocks. They will use a predefined design to create an animation based on the	To create a program using a given design • I can work out the actions of a sprite in an algorithm

	seasons. Learners will then be introduced to the task for the next lesson. They will predict what a given algorithm might mean.	• I can decide which blocks to use to meet the design • I can build the sequences of blocks I need
Changing a design	During this lesson, learners will look at an existing quiz design and think about how this can be realised within the ScratchJr app. They will choose backgrounds and characters for their own quiz projects. Learners will modify a given design sheet and create their own quiz questions in ScratchJr.	To change a given design • I can choose backgrounds for the design • I can choose characters for the design • I can create a program based on the new design
Designing and creating a program	During this lesson, learners will create their own quiz question designs including their own choices of question, artwork, and algorithms. They will increase the number of blocks used within their sequences to create more complex programs.	To create a program using my own design • I can choose the images for my own design • I can create an algorithm • I can build sequences of blocks to match my design
Evaluating	During this lesson, learners will compare their projects to their designs. They will think about how they could improve their designs by adding additional features. They will modify their designs and implement the changes on their devices. Learners will find and correct errors in programs (debug) and discuss whether they debugged errors in their own projects.	To decide how my project can be improved • I can compare my project to my design • I can improve my project by adding features • I can debug my program

Progression

This unit progresses learners' knowledge and understanding of instructions in sequences and the use of logical reasoning to predict outcomes

Curriculum links

National curriculum links

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- Create and debug simple programs
- Use logical reasoning to predict the behaviour of simple programs
- Use technology purposefully to create, organise, store, manipulate and retrieve digital content