FOUNDATION STAGE
Computing Toolkit

Sheffield City Council

Sheffield ILS eLearning Service
Improving outcomes . Embracing technology

This toolkit has been created to help teachers working in the Foundation Stage incorporate technology into lessons and provide a solid foundation for Computing at Key Stage 1.

The toolkit contains ten units organised into the following areas, to map to the Early Learning Goals. Note that although Technology is not included in the reformed ELGs, we recommend covering this area to prepare young people for their lives in an increasingly digital world. This sample contains the Technology Units only.

A	**Technology**
A1 - What is a Computer? A2 - We Control Technology A3 - Tinkering: Bee-Bots	
B	**Communication and Language**
C	**Personal, Social and Emotional Development**
D	**Physical Development**
E	**Literacy**
F	**Mathematics**
G	**Understanding the World**
H	**Expressive Arts and Design**

Progression
At the bottom of each unit there are some progression statements. These may be used to assess how children are progressing with using technology, above and beyond the Early Learning Goals.

A	Technology

A1. What is a Computer?

Key Learning: A computer is a kind of machine that can help us do things. A computer doesn't have a brain – humans give them instructions. There are computers in lots of different things we use everyday e.g. laptops, smart speakers, mobile phones, shop tills, washing machines, games consoles, tablets etc. We control computers using a mouse, keyboard, touch screen.

Suggested Activities:

i.   Discuss common technology in the home, school and wider world, e.g. washing machine; shop till; traffic lights. Encourage pupils to match pairs of images (e.g. clothes and washing machine), or image and sounds, and talk about what the technology is used for.

ii. Provide examples of everyday technology in continuous provision for pupils to explore and role play with. Can you take a computer apart and show children what is inside?

iii. Discuss what a computer is and how computers are used. You could use the BBC Bitesize resources: What is a Computer?; How can computers help you learn?; How do people use computers at work?

iv. There are lots of lovely unplugged activities at Hello Ruby to learn about computers e.g. Draw the Internet, Build your own computer.

v.   Discuss how pupils use computers, mobile devices or smart speakers at home. What do they like doing? What don't they like about technology? Use images to help guide discussion. This can be used to inform future Online Safety discussions and input (see Unit C).

vi. Investigate the school computers and tablets – how do you turn it on, or start an application? How do you change the volume or take a photo? What activities can you do with it?

vii. Explore technology in school – tour the school taking photographs of technology, e.g. tills, automatic doors, computers, tablets, display screens, walkie talkies, cameras, CD player. Create a slideshow of the photos as a small group or class. Can pupils remember what the photos are of, and what the technology is used for?

viii. Provide a limited selection of technology (e.g. tablet, phone, laptop, smart speaker, camera, games console) and ask pupils to choose which one they would use for a specific purpose, e.g. taking a photo, listening to music, watching a video, playing a game, drawing a picture, finding out information.

ix.   Look at the basic parts of a desktop computer: mouse, keyboard, monitor/screen, and create labels in Communicate: in Print or similar. Ask pupils to match images and audio/text on the whiteboard. If using tablets in school, identify screen, home button, volume control and camera.

 x.   Play the games, apps and activities in the Resources section, and talk about the different computers and technology shown in them, e.g. Nina and the Neurons.

xi.   Practise mouse skills using https://jacksonpollock.org/ - move the mouse to make marks, left-click to change the colour, double-click to clear the screen. There are also mouse-skills activities in the resources below.

xii. Practise keyboard skills using the resources below or using https://patatap.com/ - each letter on the keyboard triggers a visual and a sound. You can also print out and laminate a lowercase *qwerty* keyboard, and practise recognising and finding letters or spelling out simple words (either by pointing at each letter, or use a felt-tip pen to mark each letter).

RESOURCES
Weblinks
http://www.bbc.co.uk/cbeebies/games/nina-go-digital-game - *Spot different technology with Nina and the Neurons* http://www.bbc.co.uk/cbeebies/watch/nina-and-the-neurons-computers-song BBC Bitesize: What is a Computer? – *simple introduction* BBC Bitesize: How can computers help you learn BBC Bitesize: How do people use computers at work? Keyboard practise BBC Bitesize: Dance mat typing Mouse + keyboard skills games http://primarygamesarena.com/Subjects/ICT - Mouse and keyboard activities Hello Ruby – unplugged activities to learn about computers

Software	iPad apps	
Out and About 3: Gadgets at Home IT Mouse Skills My 1ˢᵗ Mouse	Toca Town Toca Life: City Toca Life: School	*Explore the town/city and find examples of technology*
	Washing Machine by Wimbledon Sound Pop-It-Up-Shop Plum Cooking Elevator Up / Television Time / Mobile Cell Phone *by Inclusive Technology*	

Progression

- Explore technology.
- Use different digital devices.
- Recognise that you can access content on a digital device.
- Use a mouse, touchscreen or appropriate access device to target and select options on screen.
- Recognise a selection of digital devices.
- Recognise the basic parts of a computer, e.g. mouse, screen, keyboard.
- Select a digital device to fulfil a specific task, e.g. to take a photo.

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A2. We control technology

Key Learning: Computers don't have a brain, and can only follow instructions that we give them. Humans make computers and control what they do. We can **tinker** with (explore) computers to find out what they do – this is a key computational thinking approach.

Suggested Activities:

i.   Pupils can tinker with cause and effect apps and program, or more complex programs where they complete a number of steps to make something happen, e.g. the TES iBoard resources for ICT or the Busy Things activities. Discuss who is controlling the computer and how; and whether computers have brains.

ii. Record commands onto recordable buttons, and nominate one member of the class or an adult to be a human robot (a robot hat/mask can be used to help get into character). Pupils take it in turns to press a button and command the robot to do something (e.g. touch nose, shake head, wave hands). Discuss that you are controlling the robot by giving it instructions. The robot can't do anything unless it is told to.

iii. Ask the pupils to give instructions to the human robot (see above) to help them navigate a simple maze around the room or playground. Use recordable buttons to record commands for support if required. You could blindfold the robot to make it more difficult. Emphasise that the robot can't move unless given an instruction.

iv. Ask a volunteer to play a game where they control something or someone on screen, e.g. Wii Sports, Kinect Sports, CBeebies or a TES iBoard game with directional controls, or an iPad game. This can be done as a class or individually. Discuss how the game works – who is controlling the game? How do they control the game? What happens if the player does nothing?

v.   Provide opportunities for pupils to explore different technology in the classroom e.g. camera, tablet, fan, CD player, interactive whiteboard. Can they tell you what it is used for? Ask pupils to fulfil a specific task with the technology, e.g. take a photo/turn on the fan.

vi. Give pupils a remote-controlled car or toy and ask them to explore what it does. Ask questions about who is controlling the toy, and how they make it do things. Set tasks for the pupils: drive the car through the tunnel; drive the car to me. You could blindfold the pupil controlling the remote-controlled car and their partner has to give them instructions to help them navigate a simple maze.

vii.   Create a floor mat or laminate images on a topic to create a map of places to visit. Ask pupils to control remote-controlled cars/toys to visit each place, or a place they would like to go best. For example, use beach/mountain cards, or visit numbers in order. You could also add in places to avoid. Create larger images for pupils with poor control to aim for.

RESOURCES	
Weblinks	
CBeebies games – in particular Nina and the Neurons and Octonauts games Sesame Street games eLT Scratch Games – See the *Control & Explore* activities	
Software	**iPad apps**
Busy Things - *particularly the maths – shapes and space games*	*Busy Things Bundle; Toca Boca, Sago Mini apps List of Making Things Happen apps

Progression
- Explore technology. - Use different digital devices. - Repeat an action with technology to trigger a specific outcome. - Recognise the success or failure of an action. - Follow simple instructions to control a digital device. - Recognise that we control computers.

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A3. Tinkering with Bee-Bots (or other programmable robots)

Introduction:

- Give pupils time to tinker with the Bee-Bots or similar floor robot and explore what the buttons do. Ask questions about what they discover, e.g. What do you think the arrow buttons do? How far does it move? Which button do you need to press to make it start moving?

- Discussion: What is a robot? How do we control robots? Does a robot have a brain? Explain that the Bee-Bot is a robot and we can control it by giving it instructions. What sorts of instructions does it understand?

- Control pupils to move around the room using the Bee-Bot arrows on cards or screen – you could create a grid on the floor using masking tape. Emphasise that the right and left arrows mean a quarter turn on the spot. Example commands can be found in the **Bee-Bot Basics presentation**

- Allow children to make mistakes and support them to correct them. This is really important for building resilience.

Suggested activities:

i.   Set small challenges on a grid (2 by 3 squares works well) to program the Bee-Bot, e.g. moving forward one square. Provide command cards to choose from before inputting into the Bee-Bot (see Resources). Pupils at this level can move just one square at a time, rather than planning out a full sequence of commands.

ii.   Show a very short program (1 or 2 commands) and grid on the board and ask pupils where the Bee-Bot will end up – they can test out if they are correct on their own grids.

iii. In small group work suggest an incorrect command card to move the Bee-Bot in a certain direction. Can the pupil spot the error and correct it?

iv.   Create grids for pupils to practise concepts from another subject. Practise counting with a number line; spell out high frequency words; practise road safety messages with pedestrian crossings and traffic lights. Can pupils estimate the number of moves to get to a certain square?

v.   Pupils can draw or build their own Bee-Bot grid squares based on a cross-curricular theme, e.g. a treasure map, space, myths and legends to put together to create a class grid. They can also create costumes for the Bee-Bot out of cardboard, and work with pre-programmed Bee-Bots, or move one step at a time through the grid to reach a goal.

vi.   Create a grid based on a story you are reading in literacy. Program the Bee-Bot to move around the grid in the order of events in the story as you read. Encourage pupils to anticipate what comes next.

vii.   Wonderblocks from CBeebies is a good program to show children the importance of sequence, the role of commands and problem solving: https://www.bbc.co.uk/cbeebies/shows/wonderblocks - you could watch some episodes alongside your work with Bee-Bots and draw out the learning.

N.B. Bee-Bot grids are made up of squares 15cm by 15cm.

A	RESOURCES
Weblinks	
Barefoot Bee-Bot Basics – Comprehensive lesson plan for starting out with the Bee-Bot, with printable resources. Free login required. Bee-Bot Basics presentation – Created for use at KS1, but contains the command icons you could reuse. Bee-Bot Command Cards - jigsaw – more printable command cards	

Progression
- Explore technology.
- Repeat an action with technology to trigger a specific outcome.
- Recognise the success or failure of an action.
- Follow simple instructions to control a digital device.
- Recognise that we control computers.
- Input a short sequence of instructions to control a device.

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Key Vocabulary

Here are some suggested key words to introduce to pupils in the Foundation Stage. Pupils may use some of this language, some of it may just be modelled to familiarise children with the terms. You may also add in language specific to your setting (e.g. if you use iPads).

Computer	*We are going to use the computer to make art.*
Laptop	*Can you turn on the laptop?*
Camera	*We can use the camera on the tablet to take a photo.*
Tablet	*What do you use the tablet for?*
Robot	*A Bee-Bot is a type of robot.*
Mouse	*We use the mouse to make things happen on the computer.*
Keyboard	*Type in your name using the keyboard.*
Screen	*What can you see on the screen?*
Login	*I am going to login to the computer.*
Password	*I need to remember my password.*
Internet	*We can go on the Internet to find out information.*
Search	*I'm going to search for some information.*
Website	*This website tells us all about penguins.*
Image	*I'm going to search for an image to add to my presentation.*
Audio	*Listen to the audio – the sound. What can you hear?*
Video	*Let's watch this video about …*
Text	*We can type the text into this box.*
Program	*We can program the Bee-Bot to move.*
Instructions	*A robot or computers follows our instructions.*
Control	*Humans control computers by giving them instructions.*