YEAR 1 COMPUTING

National Curriculum Guidance for Key Stage 1

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world.

Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems.

The core of Computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content.

Computing also ensures that pupils become digitally literate - able to use, and express themselves and develop their ideas through information and technology - at a level suitable for the future workplace and as active participants in a digital world.

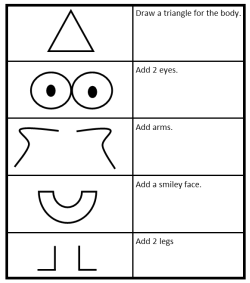
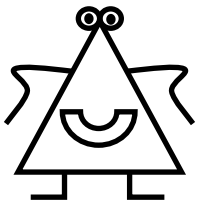
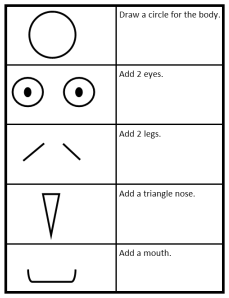
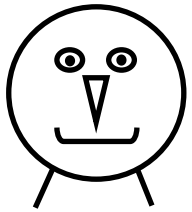
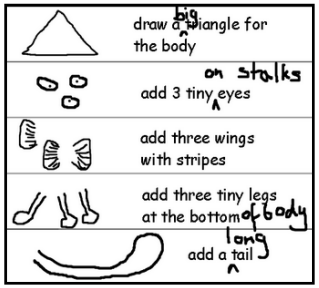
Pupils should be taught:

- To understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions
- To create and debug simple programs
- To use logical reasoning to predict the behaviour of simple programs
- To use technology purposefully to create, organise, store, manipulate and retrieve digital content
- To recognise common uses of information technology beyond school
- To use technology safely and respectfully, keeping personal information private;
- To identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

YEAR 1 COMPUTING LONG TERM PLAN

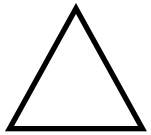
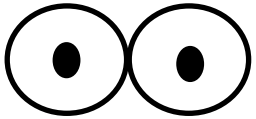
Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Ourselves	Childhood/Toys of the past	Journeys (Trains)	Journeys (London)	Rainforests (Plants)	Rainforests (Animals)
Programming	Crazy Characters Algorithms (Barefoot CAS) Write, use and improve algorithms.	BeeBots : Basics (Barefoot CAS) Create, debug, predict.	World Map Logic Activity (Barefoot CAS) Predict	Beebot using treasure island map. Predict and debug Apps : Busy Things, Bee-Bot, A.L.E.X.	BeeBots 1,2,3 Programming Activity (Barefoot CAS) Write, program and debug	3D Obstacle Beebot course Program, predict and debug. Apps : Busy Things, Bee-Bot, A.L.E.X.
National Curriculum 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.						
I.T.	Self portraits using apps. Create a digital image, save work, word process.	Create an e-book on Toys. Include photos found online as well as those taken by chn.	Make an iMovie/Slideshow on trains. Include the use of Chatterpix to bring characters to life.	Create an informative video recording about bears. Include photos and maps with labels.	Use Morfo app to give life to a rainforest animal.	Word processing.
National Curriculum Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school.						
Digital Literacy	**Media Balance is Important** (*Common Sense Media*)		**Pause For People** (*Common Sense Media*) Safer Internet Day		**Safety in my Online Neighbourhood** (*Common Sense Media*)	
National Curriculum 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.						

YEAR 1 COMPUTING - Autumn Term 1a - Ourselves

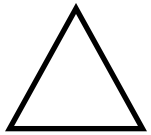
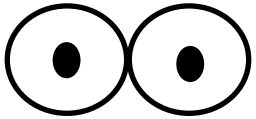
Strand	National Curriculum Requirements	Suggested Activities	Skills
Programming    	• To understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • To create and debug simple programs  	Crazy Characters Algorithms (Barefoot CAS) 1. Tell chn they are going to draw a character. Read out steps, giving time to draw each stage. Don't give any extra details. Show them the algorithm (top left). Chn share their creations. Point out that they're all different. Try to choose a picture similar to the one pictured (2nd down on left). Clear up what you really wanted. Eg "*I wanted eyes on the top of the head, wavy arms and stick legs.*" How could we change the algorithm so that it is what we want? Discuss the need for precision in algorithms. Give chn a copy of the algorithm and let them improve it, eg large; at the top, etc. Explain that an algorithm is a list of instructions/rules to make something happen. 2. Chn will create instructions for drawing their own character. Show chn the character you have in mind. Using the planning sheet, together write an algorithm for the character (eg 4th picture left). Think about a body, eyes, legs, tail, wings. Encourage them to visualise the character. Once instructions are written, ask TA to draw the character. Allow chn to create their own character and draw it (secretly) on a small piece of paper. They then write their own instructions on how to draw it. Then swap sheets with another child who will follow the instructions and draw the character. Swap back. Is it what you expected? Re-think each step and add details so that the tester will know exactly what to draw (see left). Swap sheets again, this time with someone new, and draw the character following the revised instructions. Ash chn to feed back on the task. Which instructions were easier to follow? Reinforce the need for precise algorithms.	• I know what an algorithm is • I can write an algorithm • I can use an algorithm • I can improve my algorithm CAS Barefoot Supported by BT

YEAR 1 COMPUTING - Autumn Term 1a - Ourselves

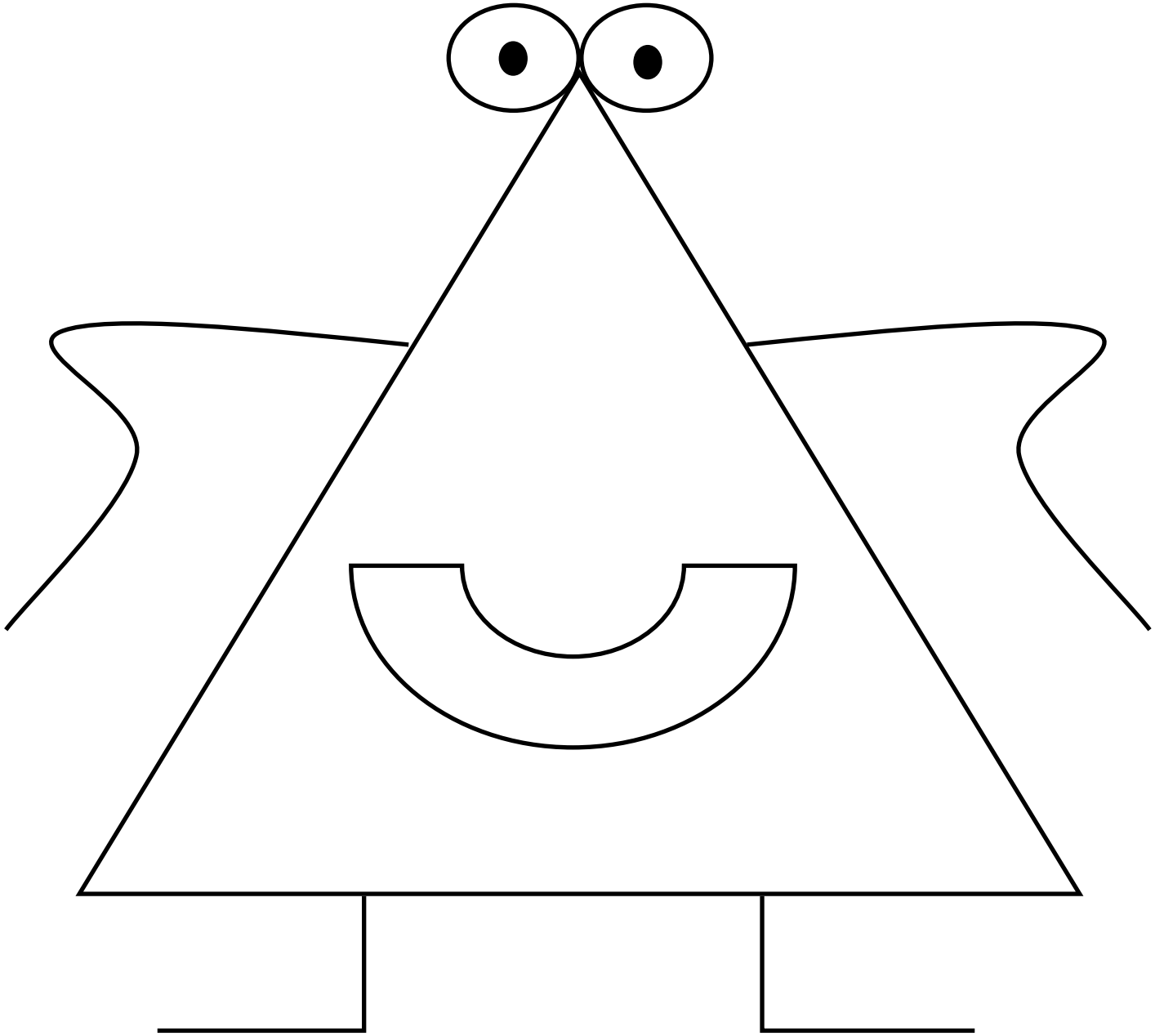
Strand	National Curriculum Requirements	Suggested Activities	Skills
I.T.	• To use technology purposefully to create, organise, store, manipulate and retrieve digital content	Using the 2Simple 'Paint' programme on the computers - chn will paint a picture of themselves. Chn will save their creations. They can then word process their name in Textease and insert picture. Extra Activities : • Use the Brushes app on the iPads to create their picture. • Add a picture of Florence Nightingale to the MORFO app and bring her to life as chn give her a voice. • Using a digital camera, children can take photos of each other to display alongside their 'painting'.	• I can create a digital image • I can save my work • I can word process
Digital Literacy	• To use technology safely and respectfully, keeping personal information private; • To identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	**Media Balance is Important** - (see separate *Common Sense Media* plans) https://www.commonsense.org/education/uk/digital-citizenship/lesson/media-balance-is-important Pupils discuss how to find a balance between online and offline activities. Other resources : Hector's World - http://www.thinkuknow.co.uk/5-7/ Resources and lesson plans : Childnet - Smartie the Penguin - ebook Childnet - Digiduck - ebook Netsmartz - Delivery for webster - ebook Other ebooks : http://www.netsmartzkids.org/eBooks Lee and Kim's Adventures : Animal Magic (available through YouTube).	• I know when and why I should take breaks from device time. • I can consider the feelings of people around me, even when playing fun, online activities.

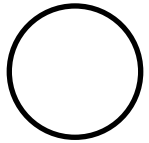
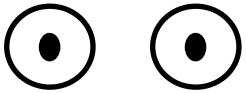
How to draw my character called ……..	
My Algorithm	
	Draw a triangle for the body.
	Add 2 eyes.
	Add arms.
	Add a smiley face.
	Add 2 legs

My friend followed my algorithm and drew	Another friend followed my algorithm and drew
Drawn by	Drawn by

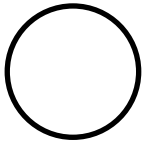
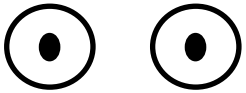
How to draw my character called ……..	
My Algorithm	
	Draw a triangle for the body.
	Add 2 eyes.
	Add arms.
	Add a smiley face.
	Add 2 legs

My friend followed my algorithm and drew	Another friend followed my algorithm and drew
Drawn by	Drawn by

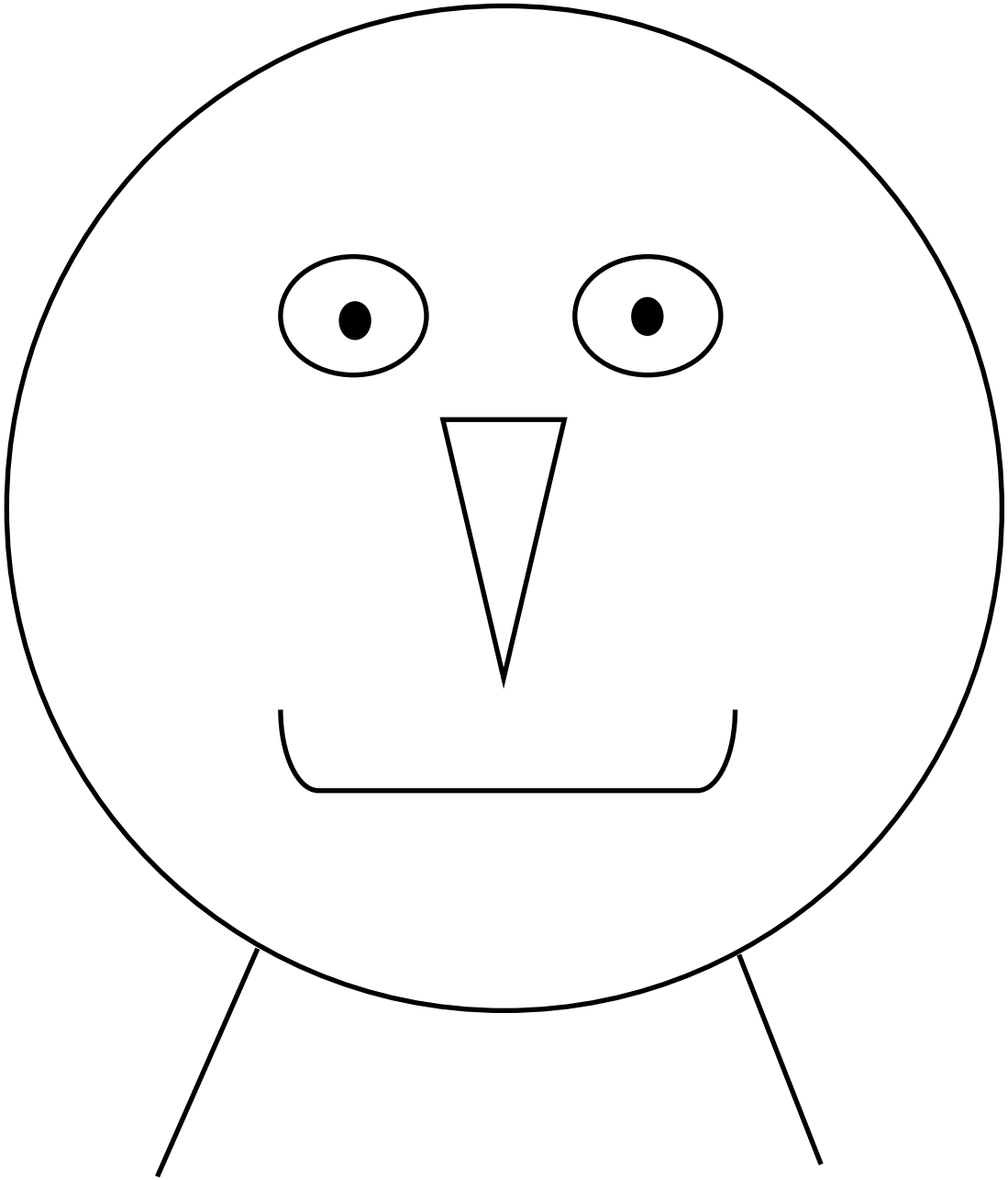


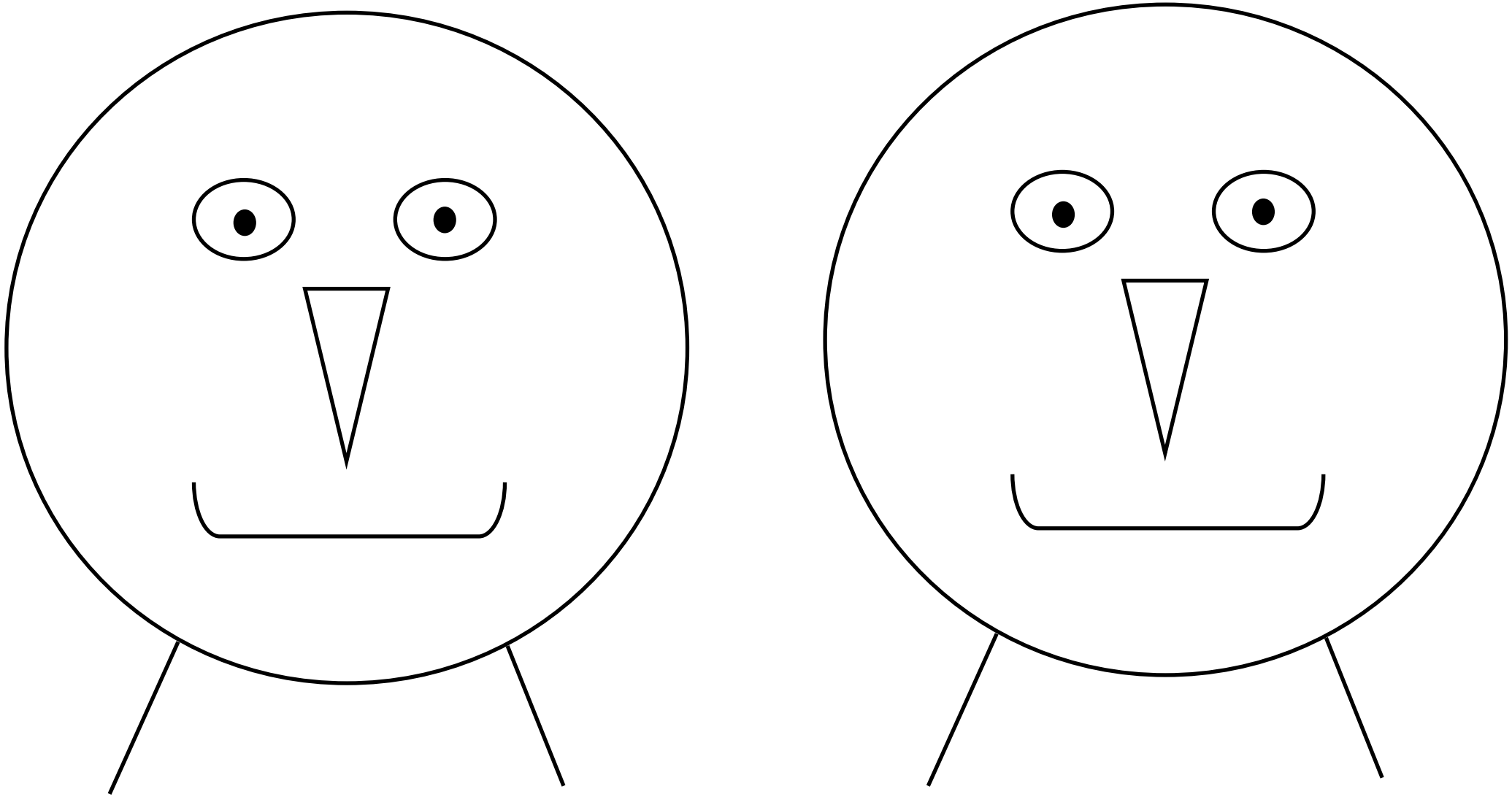
How to draw my character called ……..	
My Algorithm	
	Draw a circle for the body.
	Add 2 eyes.
	Add 2 legs.
	Add a triangle nose.
	Add a mouth.

My friend followed my algorithm and drew	Another friend followed my algorithm and drew
Drawn by	Drawn by

How to draw my character called ……..	
My Algorithm	
	Draw a circle for the body.
	Add 2 eyes.
	Add 2 legs.
	Add a triangle nose.
	Add a mouth.

My friend followed my algorithm and drew	Another friend followed my algorithm and drew
Drawn by	Drawn by





How to draw my character called ……..	
My Algorithm	
	body
	eyes
	legs

My friend followed my algorithm and drew	Another friend followed my algorithm and drew
Drawn by	Drawn by

How to draw my character called ……..	
My Algorithm	
	body
	eyes
	legs

My friend followed my algorithm and drew	Another friend followed my algorithm and drew
Drawn by	Drawn by

YEAR 1 COMPUTING - Autumn Term 1b - Toys

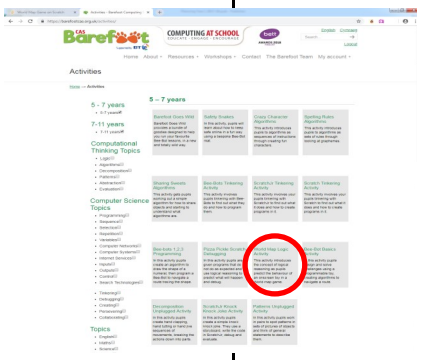
Strand	National Curriculum Requirements	Suggested Activities	Skills
Programming  	• To create and debug simple programs • To use logical reasoning to predict the behaviour of simple programs	Using masking tape, make a large 5x5 grid on the floor. Use the routes from the treasure island activity. Ask children to predict where the route will finish. Then choose a child, each time, to walk the route. Debug if necessary. The following week, give children a starting square and a finishing square and they work in pairs to write the algorithm. Test it out. Did it work? Debug if necessary. <u>BeeBots : Basics (Barefoot CAS)</u> Sit around a BeeBot mat with the BeeBot on one of the squares. Which directions can BeeBot move? (forward/back/left/right). Ask chn to draw symbols on whiteboards to show these movements (arrows). Ask chn to write an algorithm for getting from A to B (approx. 2-3 steps). Once this is done, do this as a class and Teacher to jot down the algorithm. Show chn that they can use a fake bot to check and debug. Choose a 'programmer' to program the BeeBot. Did it work? If not, what needs to be changed? Was the algorithm wrong or was there a problem when we programmed it? Correct the mistake and explain that this is debugging. In groups of 4 (ideally) - two chn to be the algorithm writers and two to be the programmers. Give them the challenges on a planning sheet. Take turns to work through the challenges. The whole team checks the result and debug as necessary. Swap roles. Talk about successes, challenges and surprises from the task. Once children have a good understanding on the movements a BeeBot can make, allow them to tinker with a BeeBot using various mats. iPad Apps to extend learning: • Busy Things • Bee-Bot	• I can write an algorithm • I can program a BeeBot • I can debug an algorithm and program *Algorithms are for people* *Programs are for computers* CAS Barefoot Supported by BT

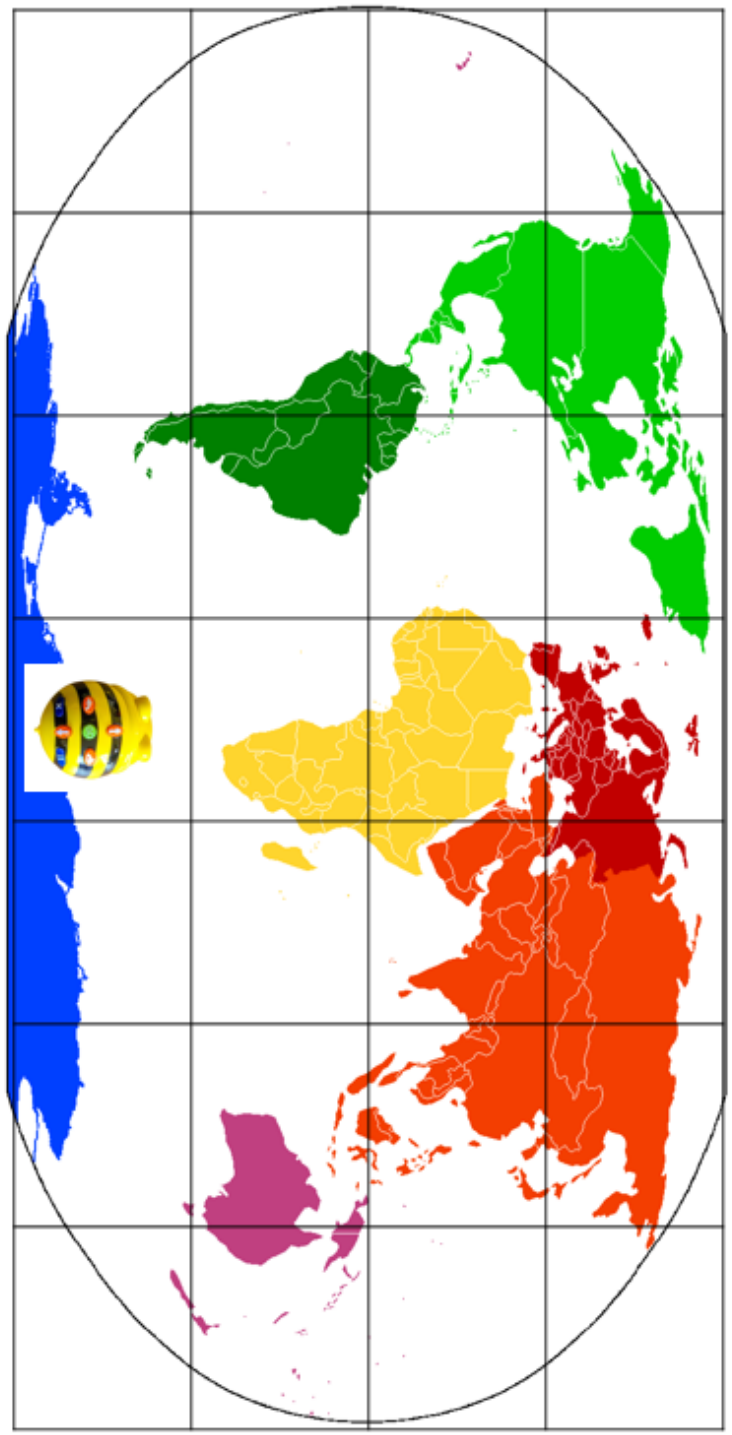
YEAR 1 COMPUTING - Autumn Term 1b - Toys

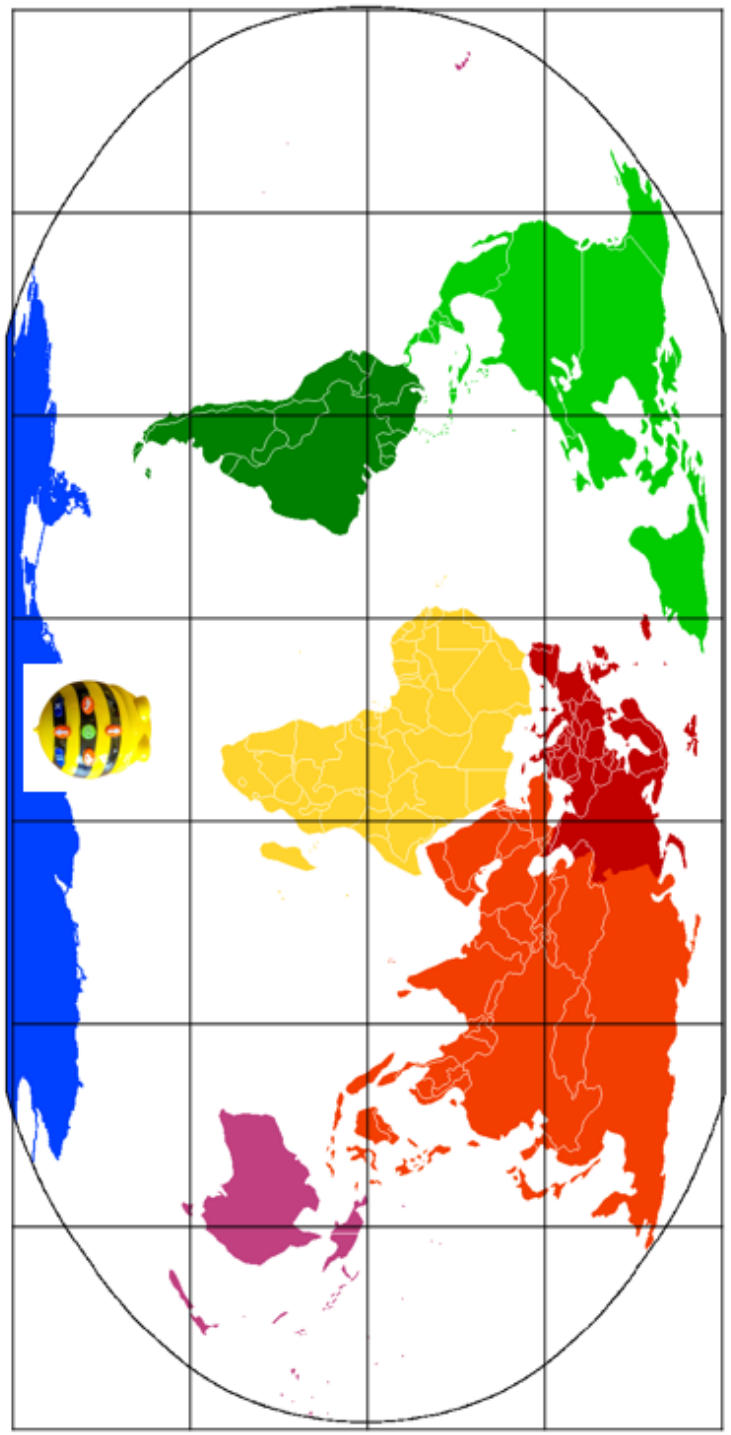
Strand	National Curriculum Requirements	Suggested Activities	Skills
I.T.	• To use technology purposefully to create, organise, store, manipulate and retrieve digital content	Work in groups to create an e-book (Book Creator app) on Toys. Chn decide together, as a class, what they want to include in the book. It could be : Toys in the past, showing a range of toys from the past, in sequence order, with a label, possibly the material it is made from too. Then, chn video each other talking about their favourite toys and upload these to the e-book. In groups, chn need to search for images of the toys they want to include and hold down on the photo then SAVE IMAGE. They can either record each other talking about their favourite toy or record audio. Extra Activities : • Children record themselves, using an iPad, talking about their favourite toy or a toy from the past, explaining how it was used.	• I can use apps to create digital content *Book Creator* *+ to add photo (or video from the camera roll), text, sound.* *Once text is typed, highlight it and click i to make it bigger/change colour, alignment, font, underline it or delete it, etc.*

YEAR 1 COMPUTING - Spring Term 2a - Journeys (Trains)

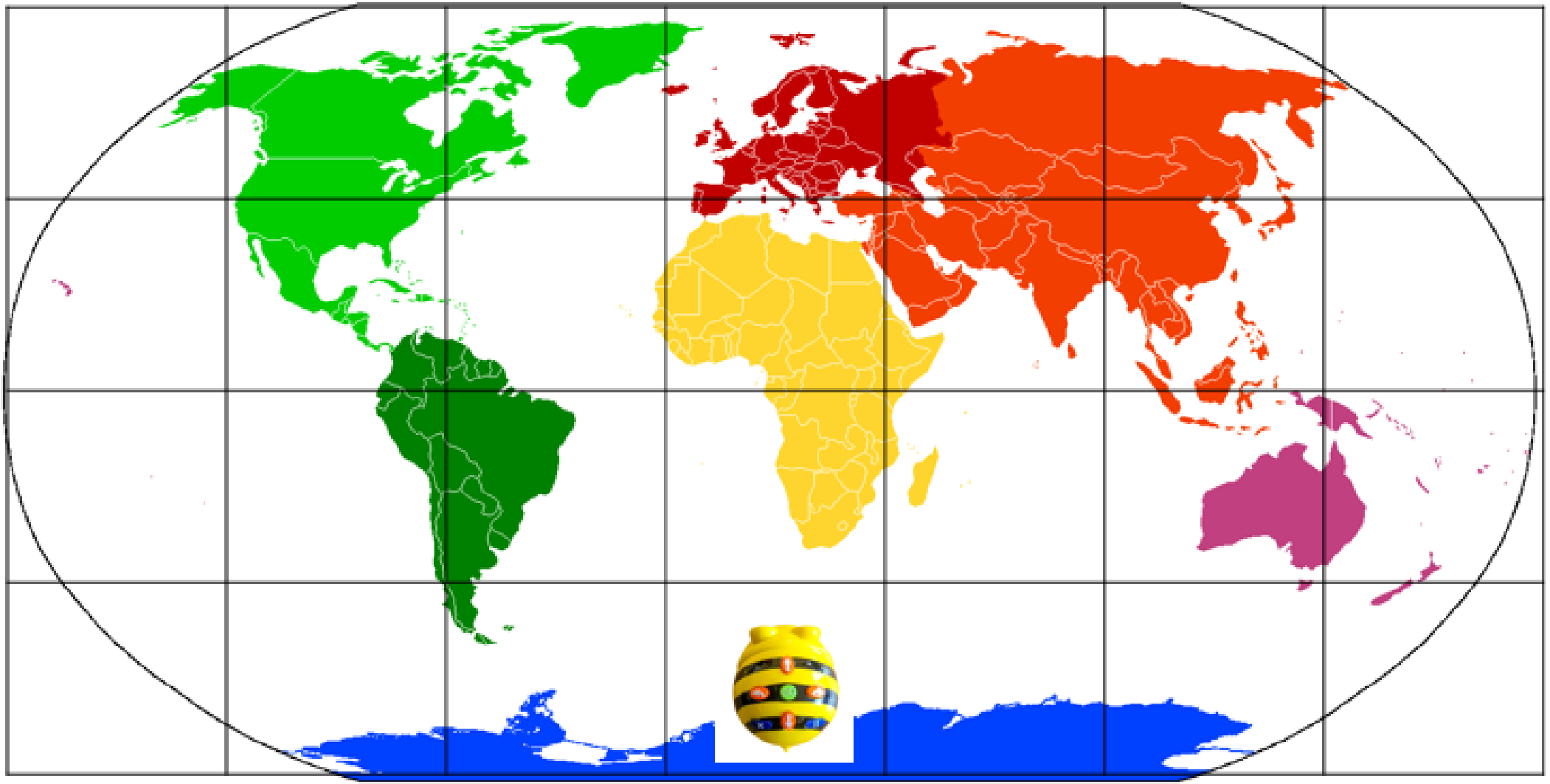
Strand	National Curriculum Requirements	Suggested Activities	Skills
Programming	• To understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • To create and debug simple programs • To use logical reasoning to predict the behaviour of simple programs • To recognise common uses of information technology beyond school	<u>World Map Logic Activity - (Barefoot CAS)</u> **Need to create a login for the barefootcas.org.uk website. https://barefootcas.org.uk/login/** Discuss with the children that we'll be using logic and prediction today. E.g. 'If it is raining then I will put my coat on'. This is logical, as I have been outside when it has been raining before and I got wet and I didn't like that, but when I had my coat on I was less wet. So I think (predict) putting my coat on will mean I won't get so wet this time. We use what has happened or learned about before to predict what will happen. Ask children to think of examples of how they use logic when playing computer games and programming. E.g. 'I know last time the angry bird fell down a gap, I lost a life, so I predict if it falls down a gap I will lose a life next time I play.' or 'I know that I have forgotten to press clear when I have been using a Bee-Bot before, and then my program has been messed up, so I predict I need to remember to press clear before I type in a new program next time I use a Bee-Bot'. Explain today we are will be using a new computer game but we need to predict how it might work. Open the World Map Game and maximise the window – so that you are ready to 'play the game'. Ask children to discuss with a partner and share what they think the game is about. What do they think they will click on? What will move? Where will it move to? What might be in the big grey box? Encourage children to explain the reason for their predictions. Have they seen games or programs like this before? Lead the discussion to their use of programmable toys such as Bee-Bots. Allow children time to tinker with the World Map game. Encourage children to predict what will happen before they try things out and to explain their ideas to their partner. Discuss findings and ensure all commands have been demonstrated. **Give children a map of their own.** Challenge the children to predict where BeeBot will end up. Click on the forward arrow twice. Share predictions and discuss why they came to their answers. Test the program by clicking Go. Click on '*click here to move to x*' to reset the game. Give children with a copy of the challenges (from the presentation) to solve in pairs. Children must predict first before they create their program to test their predictions. Children can write predictions on their map, writing number '1' in the box they expect to land in for Challenge 1. Children could then create their own challenges for their partner.	• I can predict what a program will do • I can explain why I think this







World Map Logic Activity



World Map Logic Challenge	
Challenge 1	
Challenge 2	
Challenge 3	
Challenge 4	
Challenge 5	
Own challenge	
Own challenge	

World Map Logic Challenge	
Challenge 1	
Challenge 2	
Challenge 3	
Challenge 4	
Challenge 5	
Own challenge	
Own challenge	

YEAR 1 COMPUTING - Spring Term 2a - Journey's (Trains)

Strand	National Curriculum Requirements	Suggested Activities	Skills
I.T.	• To use technology purposefully to create, organise, store, manipulate and retrieve digital content	Using the child friendly search engines used last term, children can research trains. Teacher to scribe notes if needed. Make an iMovie on trains. Chn could interview Robert Stephenson using green screen technology. They could use the app Chatterpix to bring him to life and give him a voice. or Make a class slideshow about trains. This could involve photos of trains past and present or could use photos taken from school trips. Extra Activities : Make a Pic collage of trains. Create a graph of favourite trains.	I can use search engines that are safe for me to use to research trains. I can create a simple slideshow/movie.
Digital Literacy	• To use technology safely and respectfully, keeping personal information private; • To identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	**Pause For People** (Common Sense Media) https://www.commonsense.org/education/uk/digital-citizenship/lesson/pause-for-people Pupils will learn a simple routine for how to manage transitions from online to offline.	• I know why it's important to be aware and respectful of people while using devices. • I can use the 'Pause! Breathe! Finish Up!' routine as a self-regulation strategy for transitioning from technology to face-to-face interactions.

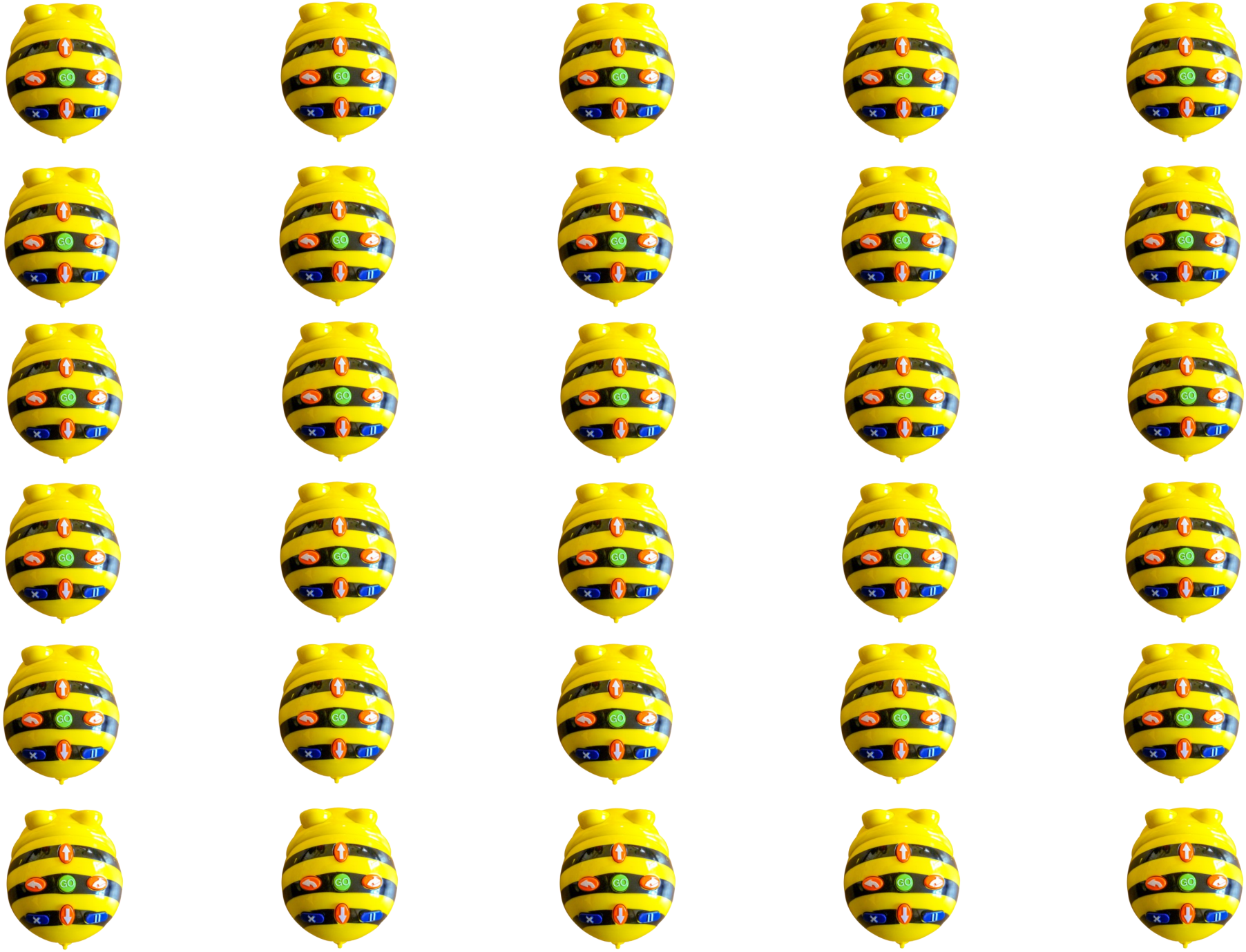
YEAR 1 COMPUTING - Spring Term 2b - Journey's (Paddington Bear/London)

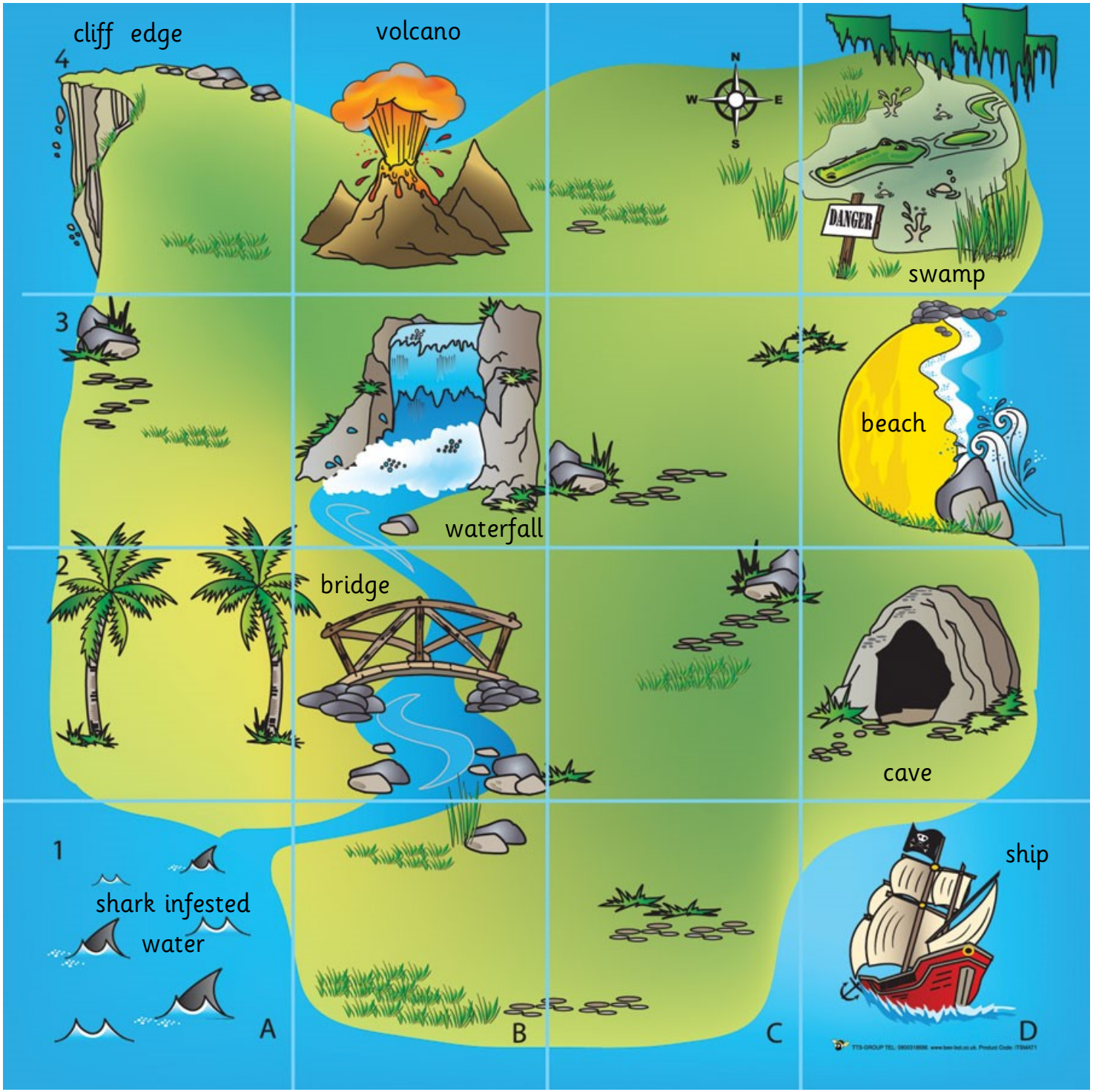
Strand	National Curriculum Requirements	Suggested Activities	Skills
Programming	• To understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • To create and debug simple programs • To use logical reasoning to predict the behaviour of simple programs • To recognise common uses of information technology beyond school	**Cut out individual BeeBots for children to move around the map.** Display the Wild West BeeBot map on the white board. Remind children of the symbols (*right, left, right turn, left turn*) and their meaning. Following on from the World Map Challenge activity, children will predict where the BeeBot will end up. Model how to make predictions on the activity sheet. Choose a 'programmer' to follow the algorithm, moving the BeeBot. Discuss children's predictions. Where they correct/incorrect? Talk about successes, challenges and surprises from the task. iPad Apps to extend learning: • Busy Things • Bee-Bot • A.L.E.X.	• I can predict what a program will do • I can explain why I think this

CAS Barefoot
Supported by BT

YEAR 1 COMPUTING - Spring Term 2b - Journey's (Paddington Bear/London)

Strand	National Curriculum Requirements	Suggested Activities	Skills
I.T.	• To use technology purposefully to create, organise, store, manipulate and retrieve digital content	Using an iPad, children can create an informative video describing the differences between two types of bear. Include photos and maps with labels. Extension activity - include some features of that particular type of bear. Extra Activities : Create a branching database of different bears. Create a graph of most common types of bear.	I can add labels to pictures.

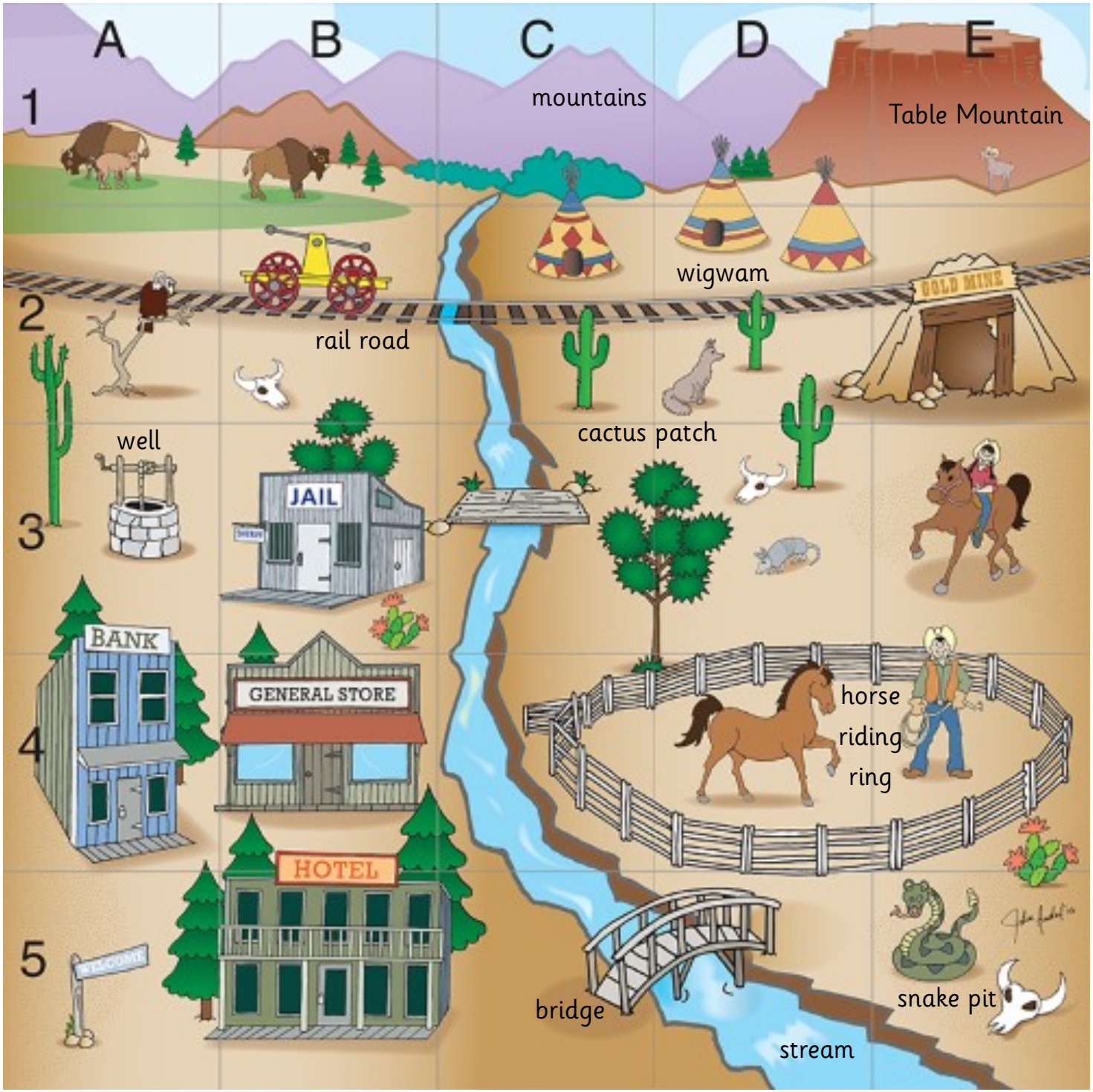

GO


cliff edge
volcano
4
N
W
E
S
DANGER
swamp
3
beach
waterfall
2
bridge
cave
1
shark infested
water
ship
A
B
C
D


GO
CLEAR
PAUSE

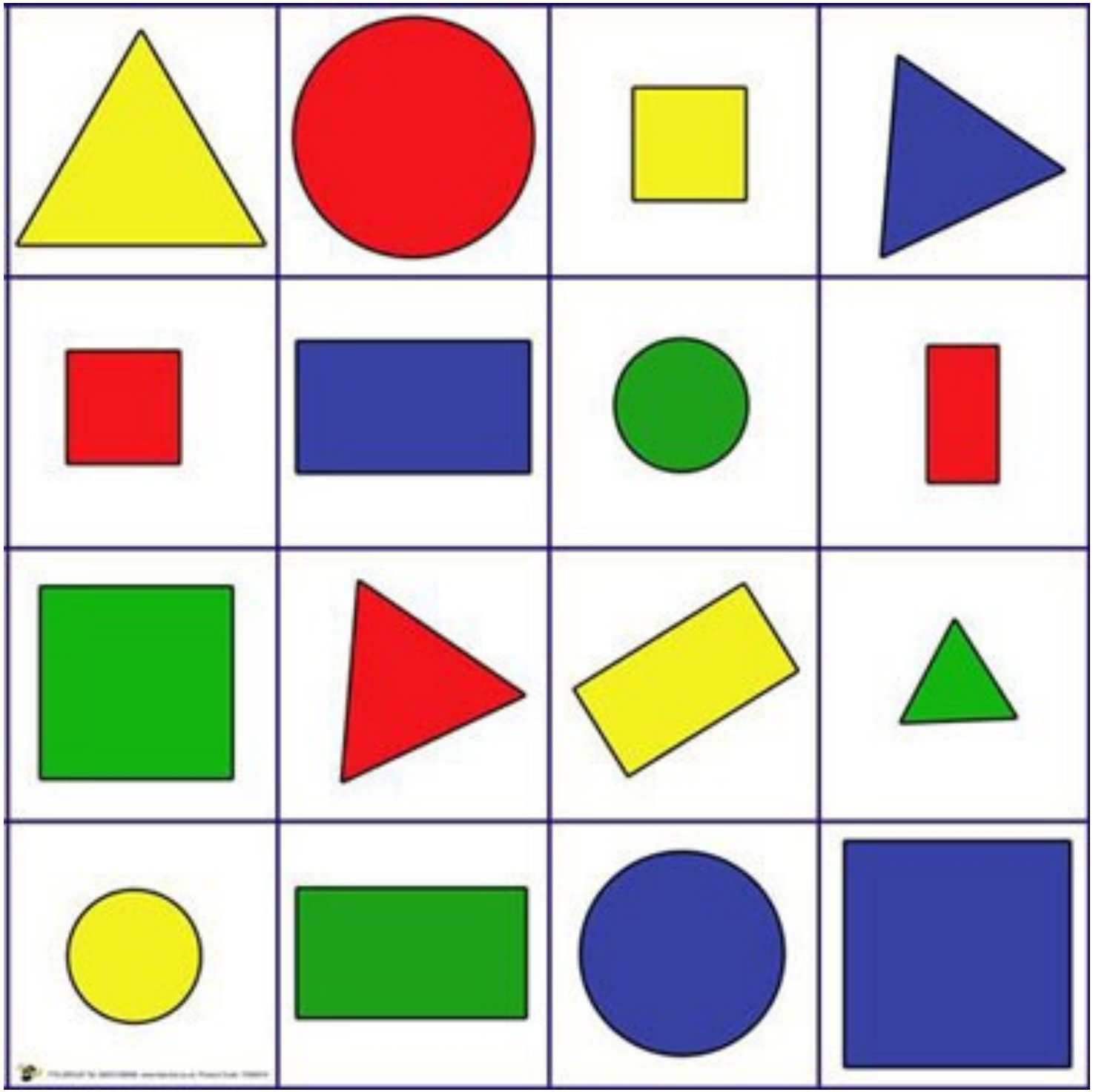
Treasure Island Challenge

Route	Algorithm	Prediction	Correct ✓	Incorrect ✗
Route 1		BeeBot will end up		
Route 2		BeeBot will end up		
Route 3		BeeBot will end up		
Route 4		BeeBot will end up		
Route 5		BeeBot will end up		
Own Route		BeeBot will end up		


A
B
C
D
E
1
2
3
4
5
mountains
Table Mountain
wigwam
rail road
GOLD MINE
well
cactus patch
JAIL
BANK
GENERAL STORE
horse
riding
ring
HOTEL
WELCOME
bridge
snake pit
stream

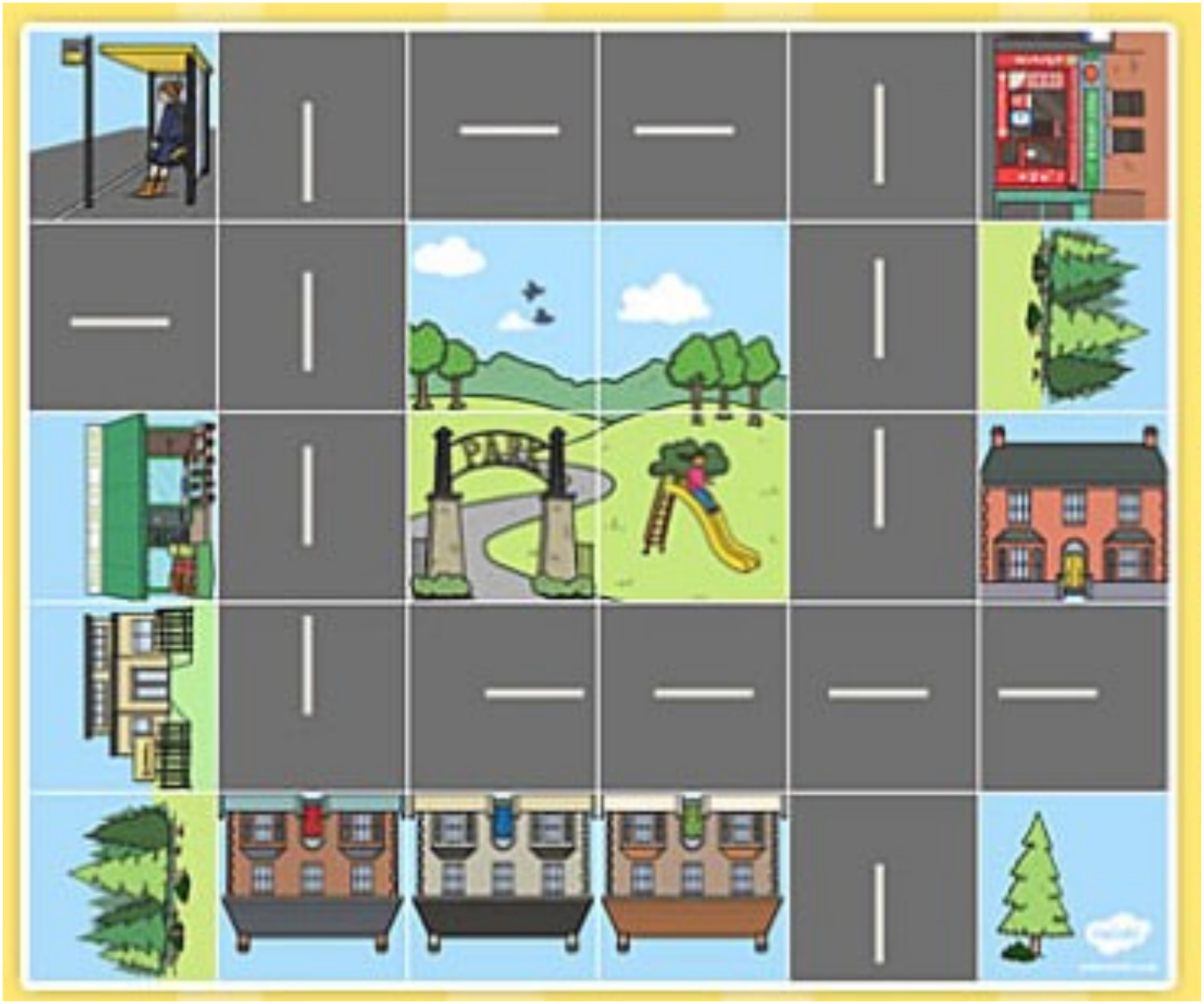
Wild West Challenge

Route	Algorithm	Prediction	Correct ✓	Incorrect ✗
Route 1		BeeBot will end up		
Route 2		BeeBot will end up		
Route 3		BeeBot will end up		
Route 4		BeeBot will end up		
Route 5		BeeBot will end up		
Own Route		BeeBot will end up		




GO
CLEAR
PAUSE


GO
CLEAR
PAUSE


PARK


GO
CLEAR
PAUSE

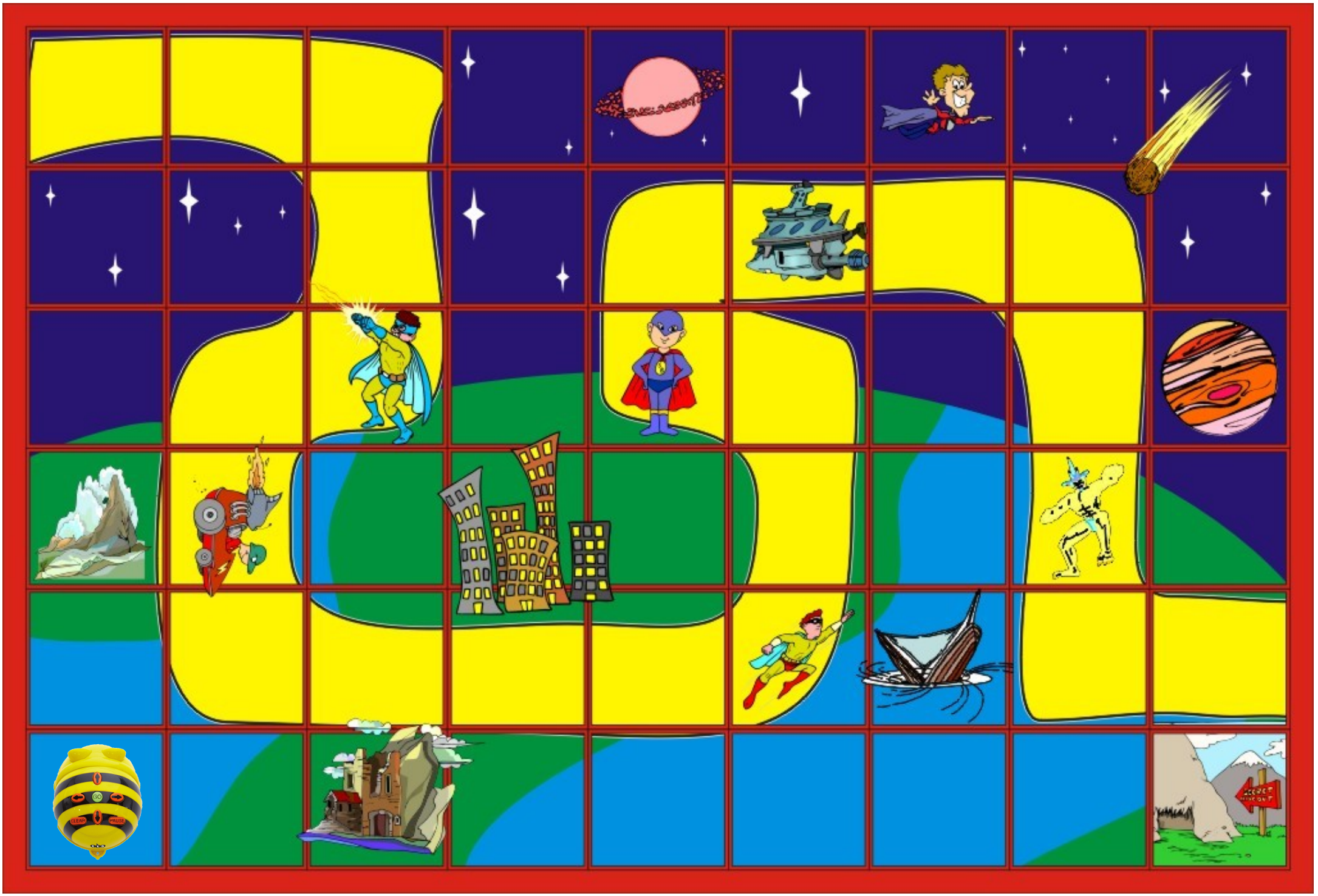

GO
CLEAR
PAUSE


CLEAR
PAUSE
GO


Cafe
POST OFFICE

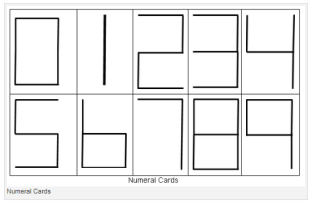

FISH & CHIPS
THE PIER

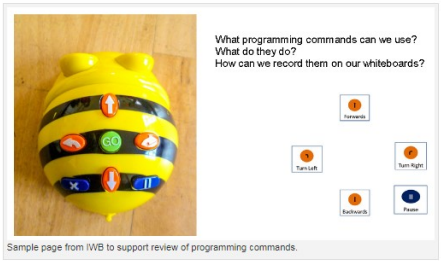

GO
CLEAR
PAUSE



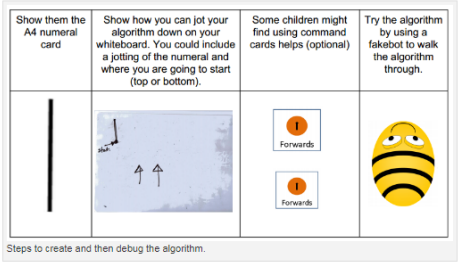
YEAR 1 COMPUTING - Summer Term 3a Rainforests (Plants)

Strand	National Curriculum Requirements	Suggested Activities	Skills
Programming	• To understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • To create and debug simple programs • To use logical reasoning to predict the behaviour of simple programs	BeeBots 1,2,3 Programming Activity (Barefoot CAS) Be bossy and give the chn some instructions (stand up, go to the door, walk to the hall, sit down). Explain that sequences of instructions are important - they help us to know what to do and how to make things happen. This lesson is about programming and how algorithms help us write in a language that computers can understand code. Remind chn that 'algorithms' are for people and 'programs' are for computers. Show chn a Bee-Bot and ask how they might program it. Record on whiteboards any Bee-Bot command symbols they know. Discuss the ideas. How could we get Bee-Bot to write he number 1? They might suggest 'forward, forward'. (Some chn might start at the top, some might start at the bottom. Encourage them to start at the top, as they would correctly form the number when writing.) How could they record this algorithm? Let chn have a go. Explain that it's a god idea to walk through an algorithm before you program it. Stand up and walk through it or use a Fake-Bot. Chn could work in pairs, with one child being the 'coder' who types in the code on Bee-Bot. Did it go well? What could be improved? Show chn the number cards and explain that they ned to look like this for Bee-Bot to make them. In groups, write the algorithm to make one of the numbers. Try to fix any problems that occur. (Number 7 and 0 will be easiest.) Quarter turns may prove difficult to understand. Once chn have written their algorithm and walked it through, the can test it on a Bee-Bot. If chn need to, they can use the command cards to work out the sequence of their steps. Encourage chn to work on small, bite-size chunks then test on he Bee-Bot. This is a useful approach to programming.	• I can write an algorithm. • I can program and debug a Bee-Bot to follow my algorithm.

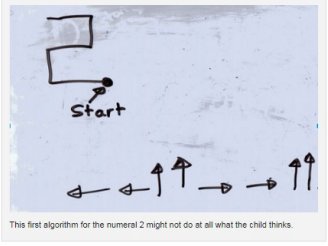

Numeral Cards



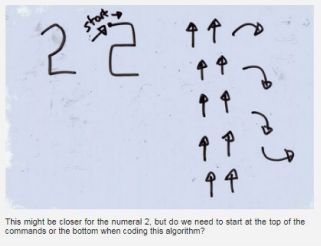
Sample page from IWB to support review of programming commands.



Steps to create and then debug the algorithm.



This first algorithm for the numeral 2 might not do at all what the child thinks.



This might be closer for the numeral 2, but do we need to start at the top of the commands or the bottom when coding this algorithm?

YEAR 1 COMPUTING - Summer Term 3a - Rainforests (Plants)

Strand	National Curriculum Requirements	Suggested Activities	Skills
I.T.	• To use technology purposefully to create, organise, store, manipulate and retrieve digital content	Create dialogue for a rainforest animal using the Morfo app. It could describe it's habitat (and possibly diet and appearance). Extra Activities : Create a PowerPoint on rainforests. Type a sentence per slide. If able, insert a picture.	
Digital Literacy	• To use technology safely and respectfully, keeping personal information private; • To identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	Safety in my Online Neighbourhood - (see separate *Common Sense Media* plans) https://www.commonsense.org/education/uk/digital-citizenship/lesson/safety-in-my-online-neighbourhood Pupils discover that the internet allows them to experience and visit places they might not be able to see in person. However, it is important to be safe when travelling online. Pupils will practise staying safe during online adventures.	• I know that the internet can be used to visit faraway places and learn new things. • I can compare how staying safe online is similar to staying safe in the real world. • I can explain the rules for travelling safely on the internet.

YEAR 1 COMPUTING - Summer Term 3b - Rainforests (Animals)

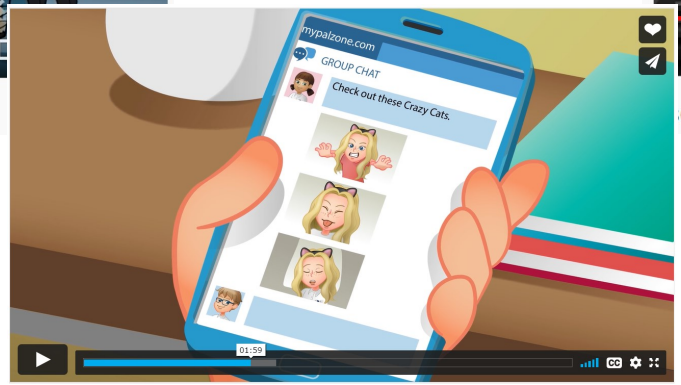
Strand	National Curriculum Requirements	Suggested Activities	Skills
Programming	• To understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions • To create and debug simple programs • To use logical reasoning to predict the behaviour of simple programs • To recognise common uses of information technology beyond school	Children create a 3D obstacle course within the classroom/hall. Using BeeBot, they will navigate around it. Working in pairs, chn will challenge their partner to program Beebot to go from A to B. Can the partner predict where the BeeBot will end up before it gets there? Use a range of apps to predict, program, debug. Beebot Busy Things A.L.E.X. Extra Activities : Write an algorithm for making a sandwich fit for a mini-beast. Include bread, butter and food fit for a mini-beast. Children should follow their own instructions to ensure they are accurate. Debug if necessary.	• I can predict what a program will do. • I can write an algorithm. • I can program and debug a Bee-Bot to follow my algorithm. • I can debug an algorithm and re-program

YEAR 1 COMPUTING - Summer Term 3b - Rainforests (Animals)

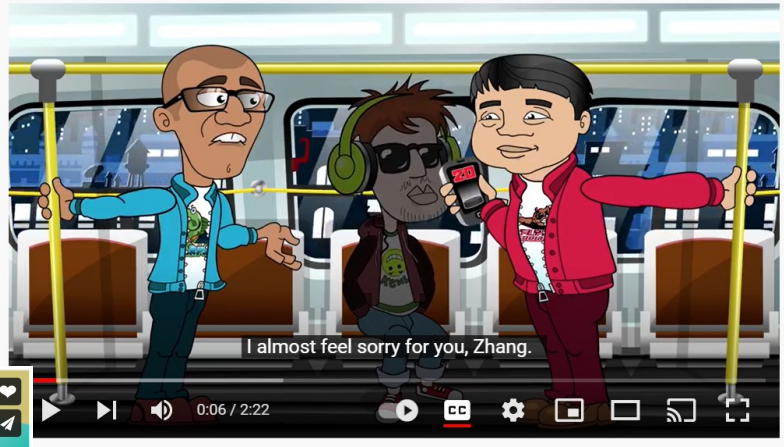
Strand	National Curriculum Requirements	Suggested Activities	Skills
I.T.	• To use technology purposefully to create, organise, store, manipulate and retrieve digital content	Using Word/Textease (with an inserted photo of an animal), chn will word process facts about their given animal. Extra Activities : Create an e-book, including photos and facts about the animal.	I can word process facts about mini-beasts.

RBC Cyber Security - Powerful Passwords

https://www.youtube.com/watch?v=IhlXtBNNuKs



HeroCyberSmart https://www.esafety.gov.au/educators/classroom-resources/cybersmart-challenge/cybersmart-hero



C Cyber Security - Keep it Private

https://www.youtube.com/watch?v=EuPmIEH8zLg

RBC Cyber Security - No Phishing!

https://www.youtube.com/watch?v=pgRc8w44XFE

RBC Cyber Security - Socially Cautious

https://www.youtube.com/watch?v=eN4Lc-MtUp0