Barefoot Computing at School

In collaboration with BT

Recommended for **ages 5-7**

World Map Logic

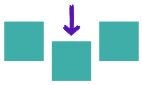
An introduction to logic

Duration: **30 minutes**

Concepts and approaches covered

Logic

Programming



Tinkering

Overview

In this activity, pupils look at sequences of commands to predict what they do. They use logical reasoning to explain their predictions before programming and testing their commands to see if their predictions are correct.

Pupil objectives

- I can predict what a program will do
- I can explain why I think this

Resources

- MIT's Scratch 3.0 (Please refer to this guide on the ways to download and use our Scratch resources in your school)
- An interactive whiteboard to display Scratch as you work through this lesson
- Pupil access to Scratch, in pairs, and project Scratch resources – either download from the link at the bottom of this webpage (World Map Game.sb2) or use within the Scratch 3.0 online editor from this link: World Map Game
- WorldMap Logic presentation including challenge pages (you can access these resources from the downloads folder)
- Programming Command Cards (optional for support)
- Fake Bots (optional for support)

Introduction 10 minutes

Explain that today the focus of the lesson will be logic. Ask pupils what they think this means and discuss as a class. Use real world examples to explore the idea of logic and explain the idea of prediction. (See **slides 2** to **4** for some ideas but adapt to your class)

For example:

- 'If I sit quietly and listen to my teacher then I won't get in trouble' etc
- '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

I know it's raining

I know if I wear my coat I do not get wet

I predict if I wear my raincoat today I will not get wet

Example slide to help explain logic and predicting (slides 2, 3, 4)

We use what has happened or learned about before to predict what will happen.

Ask pupils to think of examples of how they use logic when playing computer games and programming.

Lead the discussion to ensure that at least a couple of examples that are relevant to pupils' programming experience or current popular computer games are discussed. For example, '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.'

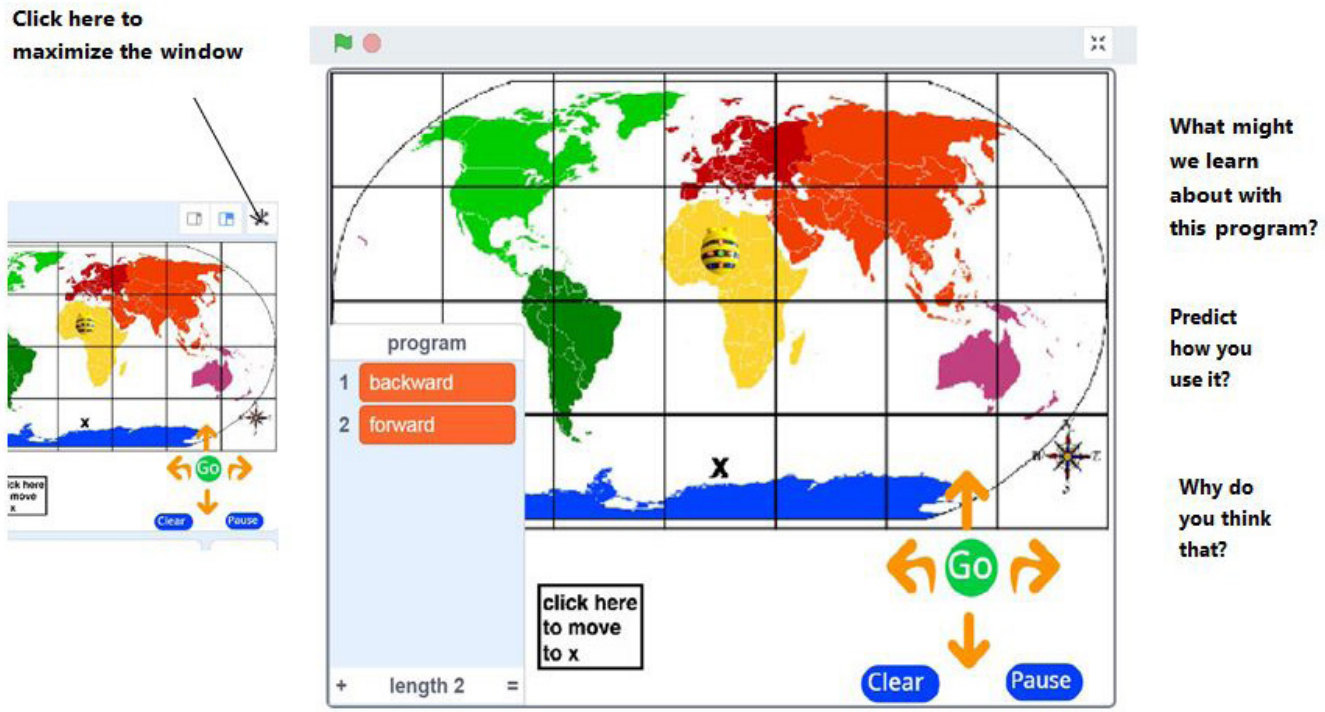
'I know that I have forgotten to press clear when I have been using a Bee-Bot before, my program has been messed up, so I predict I need to remember to press clear before I type in a new program next time I use a Bee-Bot'.

Explain today we will be using a new computer game. But we need to predict how it might work.

Introducing the World Map Game

Open the World Map Game

Maximise the window – so that you are ready to 'play the game'



Demonstrate how to open the World Map Game and maximise the window to get ready to play with it. (See teaching notes for further information on how the programming languages works for the game)

Ask pupils to discuss with a partner and share what they think the game is about.

Quickly revise the continents of the world, perhaps using **slides 7** and **8** and the link to a continents song.

Return to the look at the game and ask pupils to predict how it will work. What do they think they will click on? What will move? Where will it move to? What might be in the big grey box?

After a few minutes, discuss pupils' ideas. Encourage pupils 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 (if they have encountered them before).

Tinker with the program

In pairs, give pupils 5 minutes to tinker with the World Map game.

Encourage pupils to predict what will happen before they try things out and to explain their ideas to their partner. (You could ask pupils to take it in turns, one predicts what will happen when they click on a command and then the other tries it out, and they swap).

Main activity 20 minutes

Discuss what pupils have discovered.

Ask pupils to demonstrate and explain how the game works. Ensure that each of the direction commands: go, clear, pause and click here 'buttons' have been demonstrated. Pupils should also understand how they build up a program using the orange arrow keys, as displayed in the grey program box and the press Go executes the commands to move the Bot.

Explain you are going to be doing some geography now and some logic. You have a challenge - they need to predict where the Bot will end up if you use this program.

Click on the forward arrow twice and ask pupils to predict what will happen when you press Go. Model how to record your prediction, either on a challenge worksheet, on a whiteboard or in an exercise book.

Share predictions and discuss why pupils came to their answers.

Test the program by clicking Go. Discuss any differences between the predicted outcome and the actual outcome.

Model how to click on 'click here to move to x' to reset the game.

Provide pupils with the photocopied challenges (printed from the presentation) and ask them to solve in pairs. Ensure pupils understand they must predict first before they create their program to test their predictions. Pupils can write predictions on their challenge sheet, on a whiteboard or in an exercise book.

Pupils could take it in turns to predict and explain their answer to their partner, then the partner tests it and they swap, or they can work collaboratively on each challenge.

If pupils complete all the pre-set challenges, ask them to create their own challenges for their partner.

Plenary

Share interesting programs that the pupils have created during the main task and showcase any new challenges that have been created, asking others to predict the outcome and explain their thinking.

Ask pupils where they would land if they used the commands – backwards, forwards and why (Antarctica – it returns to where you started and we started on Antarctica).

Recap the term 'logic' with pupils – can they explain how they have been using their logical reasoning?

Differentiation

Support

Some pupils may find command cards (see 'resources') help them predict what the programs will do, as they can lay them out. Pupils could use a fake bot (see 'resources') or a Bee-Bot to step through the program

Stretch and Challenge

When creating new challenges, pupils can think of sets of commands that have a pause in them, e.g. visit all continents and pause on each of them. When their partner predicts what this does they should be encouraged to predict what the commands do up to the first pause, and test this, before moving on to the next part. In doing this, they will decompose the overall problem into parts. They could create more than one route to a continent and compare the solutions (evaluation). Is it the shortest route? Does it miss the most oceans? Encourage pupils to explain their reasoning

Assessment opportunities

Pupils record their predictions on their handouts, whiteboards or in an exercise book. The following questions can be used to assess progress and encourage logical reasoning:

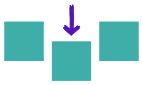
- Predict what that program will do? Why do you think that?
- What is the sequence of steps? What will they do?
- What will happen? How do you know?
- Can you explain that?

Teaching notes

Concepts and approaches

Logic
In this activity, pupils use logical reasoning to predict what a set of commands (a program) will do

Programming
Programming languages enable us to communicate instructions to machines, particularly computers. In this activity, the World Map Game programming language consists of only eight commands. These commands are based on the Bee-Bot language



Tinkering
Tinkering means trying things out. In this activity, pupils tinker with the World Map program to find out how it works

Curriculum links

Please refer to the resource overview page on the website, to understand how the learning objectives covered in this lesson relate to the curriculum in your country.

Related activities

KS1 Pizza pickle debugging activity

KS2 Logical number sequences activity

Barefoot

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