Blue-Bot Teachers Guide

Previous Experiences

Prior to using Blue-Bot with its companion app children could work with Remote Control vehicles and Bee-Bot. Remote control vehicles can help develop an understanding of action / reaction and directional language. Bee-Bot offers a good route into very early programming.

Progression

The activities listed below are in a suggested order of progression. There isn't a specific amount of time that should be spent on each activity. The time will vary from situation to situation. It may also make sense to break some of the activities down further to suit children's needs.

National Curriculum

The National Curriculum for Computing references below are indicative of some aspects of the curriculum that the activity covers. They are not an exhaustive list nor do they indicate that one activity fully covers that curriculum area. The activities support children in learning Computing skills and applying computational thinking. Using Blue-bot can support children in developing their computational thinking skills; it helps children to engage in open ended problems which require the use of decomposition, modelling and algorithms. It aids children to develop these aspects which can then be applied to many different aspects of the curriculum.

Additional Support

A separate user guide is available for the Blue-Bot App providing more detail of its operation. There is also a downloadable poster of Blue-Bot which has all its key parts labelled.

Teacher Notes

Key Focus: Creating a simple program one step at a time.

National Curriculum for Computing:

Key Stage 1

- **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

Preparation:

Set up a suitable mat e.g. Shape Mat (smaller ones are probably better) and check that Blue-Bot connects to the app. Open the app. Select the appropriate mat. Then choose Explore Mode and Step by Step

Activity

Introduce Blue-Bot and the Blue-Bot app. Explain that Blue-Bot is a floor robot that can be controlled from a tablet/computer. Explain that instructions are sent to Blue-Bot using Bluetooth. Robots are becoming more common in everyday life for example they are used in factories to make cars, they can also be found in homes as vacuum cleaners or lawn mowers.

Children should work in pairs or small groups. They need to set each other challenges to complete. These should be, setting Blue-Bot's starting point and the destination to get to e.g. Using the Shapes Mat. Start Blue-Bot on the yellow circle and get to the red triangle.

The child given the challenge should then try and get to the destination by moving one step at a time. They are not allowed to touch the real Blue-Bot once they've set its start position. Once they've managed to get Blue-Bot to the right destination they should press "Go" to run their full program/algorithm. As it runs they can watch it step through on the screen on the floor.

A simple extension to this activity could be to set obstacles, squares that can't be driven over. e.g. Start on the green rectangle and get to the blue rectangle without going over any yellow shapes.

Teacher Notes

Key Focus: Writing and debugging a program.

National Curriculum for Computing:

Key Stage 1

- **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**

Key Stage 2

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; **solve problems by decomposing them into smaller parts**

Preparation:

Set up a suitable mat e.g. Shape Mat (smaller ones are probably better) and check that Blue-Bot connects to the app. Open the app. Select the appropriate mat. Then choose "Explore Mode" and "Basic Programming".

Activity

After solving challenges step-by-step children should move on to planning a route before pressing Go (Basic Programming). At first the challenges will be similar to those above. The 'programmer' should try and put in all the instructions they think they need to complete the task. When they press Go they can see if they've managed to complete the challenge. If they haven't been successful they should debug their sequence of instructions and try again. Their debugging may mean that instructions need refining by adding, moving or removing. The Pen tool is useful to see where Blue-Bot has been. Pauses can be used to help break a problem down in to chunks (decomposition). When straight forward challenges are solved the idea of obstacles should be introduced. After that the challenges can become more difficult e.g. Shape mat - Can you visit two red shapes or all the triangles? Money mat - can you make 12 pence? How few steps can you use to make 12 pence?

Teacher Notes

Key Focus:

National Curriculum for Computing:

Key Stage 1

- **use logical reasoning to predict the behaviour of simple programs**

Preparation:

Set up a suitable mat e.g. Shape Mat (smaller ones are probably better) and check that Blue-Bot connects to the app. Open the app. Select the appropriate mat. Then choose "Explore Mode" and "Basic Programming". Or use "Challenge Mode" - "Random Instructions".

Activity

Children should be able to read simple programs and work out what they will do. They could work with a partner and create simple Blue-Bot instructions for each other read and predict where Blue-Bot will end up. They could begin by deciding where Blue-Bot will start from and then add one instruction. Their partner could indicate where they think Blue-Bot will get to and then press Go to check they are correct. They could switch roles and repeat the process. After that they could move to two instructions, then three, then four etc. Alternatively they might just choose to tap the direction buttons randomly and see if they can predict where Blue-Bot will get to. Again this could start with one instruction and increase each time. In the Blue-Bot app challenge modes there is a set of challenges called "Random Instructions". This automatically creates challenges similar to those outlined above.

Teacher Notes

Key Focus:

National Curriculum for Computing:

Key Stage 1

- **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**

Key Stage 2

- **design, write and debug programs that accomplish specific goals**, including **controlling** or simulating physical systems; **solve problems by decomposing them into smaller parts**
- **use sequence**, selection, and **repetition** in programs; work with variables and various forms of input and output
- **use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs**

Preparation:

Set up a suitable mat e.g. Shape Mat (smaller ones are probably better) and check that Blue-Bot connects to the app. Open the app. Select the appropriate mat. Then choose "Explore Mode" and "Repeats".

Activity

As children become more confident in their Blue-Bot programming skills they can work towards becoming more efficient in their programming. They can look at how they can reduce the number of commands they need by using repetition. For example rather than 4 forward steps they could repeat 1 forward step 4 times. Again this activity works well by starting simple challenges. Using bigger mats is a good way to extend this activity.

Teacher Notes

Key Focus:

National Curriculum for Computing:

Key Stage 1

- **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**

Key Stage 2

- **design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts**
- **use sequence**, selection, and **repetition** in programs; work with variables and various forms of input and output
- **use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs**

Preparation:

Set up a suitable mat e.g. Shape Mat (smaller ones are probably better) and check that Blue-Bot connects to the app. Open the app. Select the appropriate mat. Then choose Explore Mode and "Repeats" and then "45 Degree Turns".

Activity

Starting with Repeat mode, children can explore which shapes they can draw. With only 90° turns available there is an obvious limit to the range of shapes that can be drawn. Switch the app to 45° mode and explore which shapes can now be drawn. Shapes can be drawn with just 45° turns and also combinations of 90° and 45° turns.