



Blue-Bot

Teacher Guide

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Blue-Bot

Bluetooth programmable floor robot

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National Curriculum for Computing

Blue-Bot for KS1 Computing

Blue-Bot is well suited to supporting a number of aspects of computing. At KS1, it can be used to help pupils:

- 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

Blue-Bot for KS2 Computing

At KS2, Blue-Bot can be used to help pupils:

- 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

The National Curriculum for Computing references (above) are indicative of some aspects of the curriculum the activities cover. 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 will help children engage in open-ended problems which require the use of decomposition, modelling and algorithms.

Previous Experiences

Prior to using Blue-Bot with its companion app, children may have worked 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 is no specific amount of time to be spent on each as this will vary from one situation to another. It may also be necessary to break some of the activities down further to suit children's needs.

Additional Support

Further detail on the Blue-Bot App is provided at the back of this guide. A poster with all key parts labelled is also available to download.



Key Focus 1 - Creating a simple program one step at a time.

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 which can be controlled from a tablet/computer. Explain that instructions are sent to Blue-Bot using Bluetooth (a wireless technology used for exchanging data over short distances). Talk about robots 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 to set challenges for each other. They might decide on Blue-Bot's starting point and give a destination, e.g. (using the Shapes Mat) "Begin on the yellow circle and get to the red triangle."

The child given the challenge should move Blue-Bot one step at a time. They are not allowed to touch the real Blue-Bot once they've set its start position. Once the correct destination is reached they should move Blue-Bot back to its start position and press 'Go' to run their full program/algorithm. As it runs they can watch it both on the screen and on the floor.

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



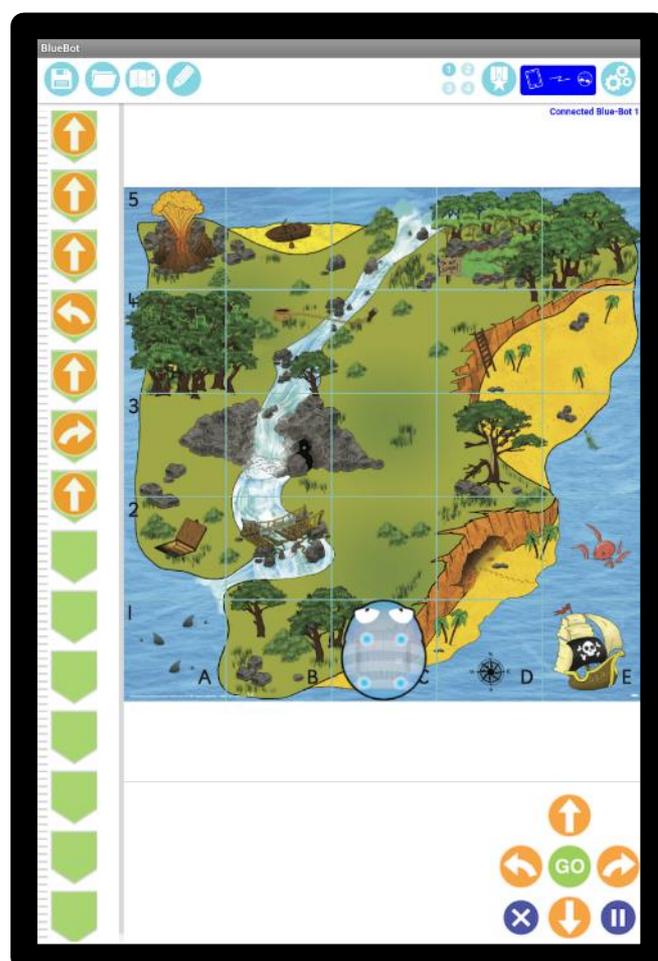
Key Focus 2 - Writing and debugging a program

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 then try planning a route before pressing 'Go' ('Basic Programming'). Initially the challenges will be similar those in Key Focus 1. The 'programmer' should input all the instructions they think necessary to complete the task. When they press 'Go' they will find out whether they have completed the challenge. If they haven't been successful they should **debug** the sequence of instructions and try again. Debugging may mean 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 into chunks (decomposition). When straightforward challenges are solved the idea of obstacles should be introduced. Finally, more difficult challenges may be set, such as - using the shape mat - "Can you visit two red shapes or all the triangles?" or - using the money mat - "Can you make 12 pence? What is the fewest number of steps can you use to make 12 pence?"



This activity could also be completed using the Blue-Bot TacTile Reader.

Key Focus 3 - Reading 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'.

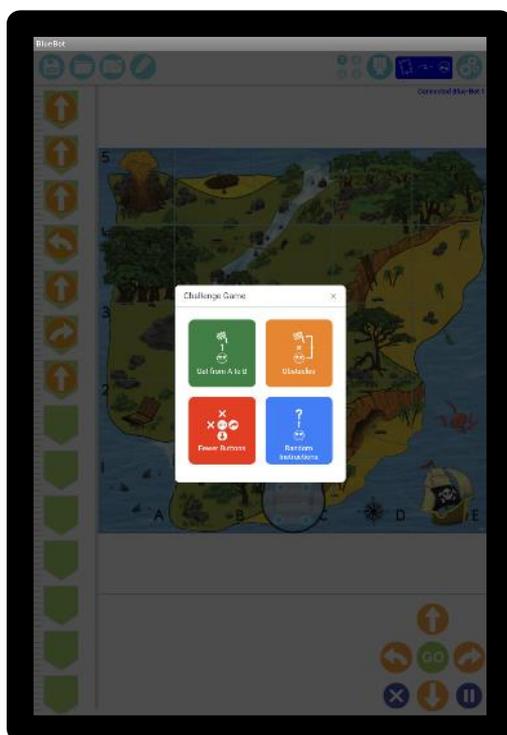


Activity

Children should practise reading simple programs and discover what they do. They might work with a partner to create instructions for each other. The first child should decide where Blue-Bot will start and add one instruction to the command sequence. Their partner will then indicate where Blue-Bot will end up and press 'Go' to check if they are correct. Switch roles and repeat the process. To increase the difficulty, try two or more instructions at a time.

Alternatively, try randomly tapping the direction buttons in the app and predict where Blue-Bot will land. As before, begin with one instruction and add another each time a successful prediction has been made.

The app 'challenge' mode has a 'Random Instructions' option. This automatically creates challenges similar to those outlined above.



This activity could also be completed using the Blue-Bot TacTile Reader.

Key Focus 4 - Becoming more efficient

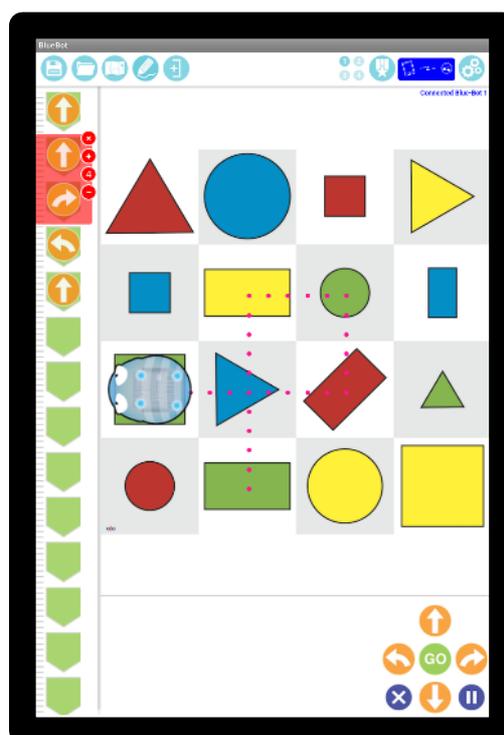
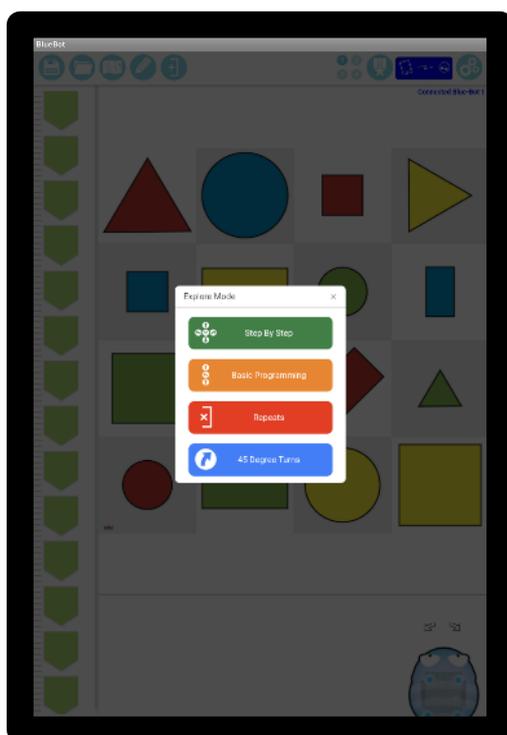
Preparation

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 should try to be more efficient by reducing the number of commands they need. This is achieved by using repetition. For example, rather than '4 forward steps' they should repeat '1 forward step' 4 times. As before, begin with simple challenges and build up. Use larger mats to extend this activity.



This activity could also be completed using the Blue-Bot TacTile Reader.

Key Focus 5 - Repetition in programming

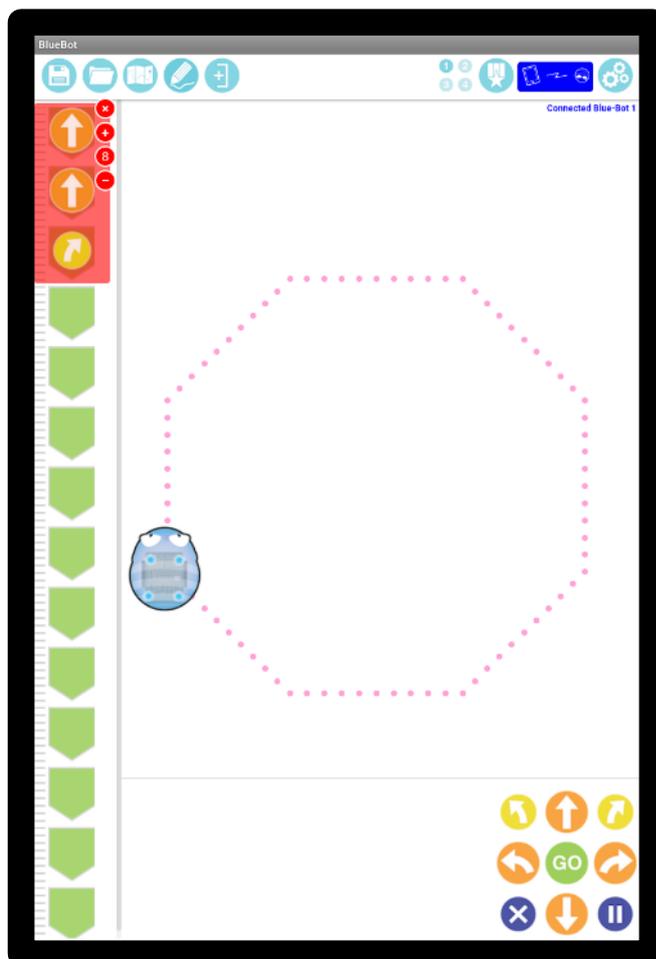
Preparation

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', 'Repeats' and '45 Degree Turns'.

Activity

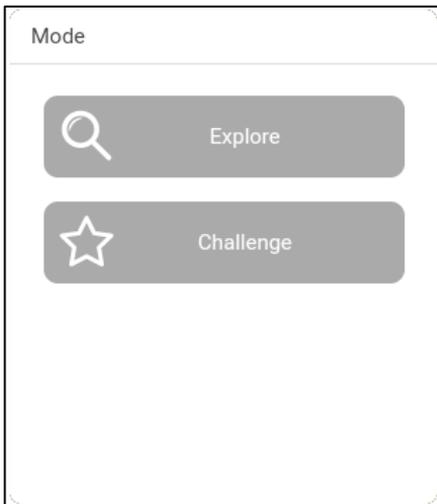
Starting with 'Repeat' mode, children should explore which shapes they can draw. With only 90° turns available there is an obvious limit to the range of shapes. Switch the app to ' 45° ' mode and explore which shapes can now be drawn.

Shapes may be created with 45° turns and/or combinations of 90° and 45° turns.

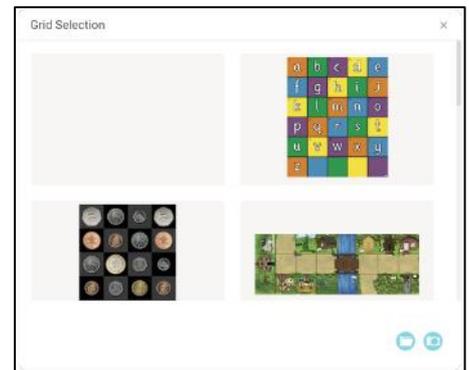


Getting started with Blue-Bot®

When the Blue-Bot app is launched for the first time it has limited functionality. Once connected to a Blue-Bot all functions are unlocked. This need only be done once.



Once the App has opened the option to select a mat will appear. Tap on a mat to select it. Mats may also be imported or photographed (see page 21).



Two modes are available:

Explore mode is open-ended, allowing you to set your own challenges and activities.

Challenge mode provides a range of activities and problems to solve.

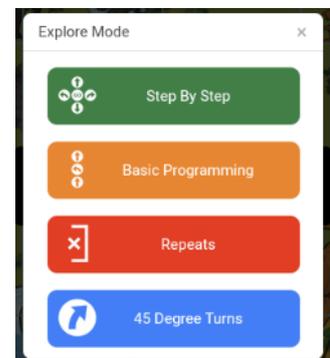
Modes can be switched at any time using the buttons on the main toolbar.

Explore Mode

Explore mode offers four different programming options.

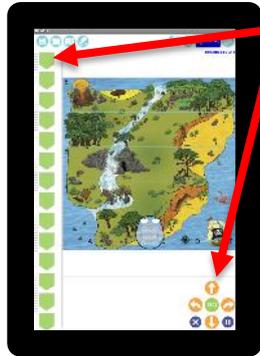


- 1. Step by Step** – This allows a Blue-Bot program to be built one command at time. As the command button is tapped Blue-Bot will move and the command will be added to the program. The entire program can be played back by pressing 'GO'.
- 2. Basic Programming** – A number of commands may be added to the program before they are run. Commands are added by tapping the command buttons or by 'drag and drop'. Commands may also be moved around and deleted.
- 3. Repeats** – This mode incorporates Basic Programming and also allows one or several commands to be repeated (looped).
- 4. 45° Turns** – This mode builds upon 'Repeat' and allows Blue-Bot to be turned through 90° and 45°.





Once a programming mode has been selected a Blue-Bot icon and a mat will be displayed. Drag the Blue-Bot icon onto the mat to the position you wish it to start. When you release Blue-Bot it will snap into a square.



The command buttons and command sequence will be displayed.

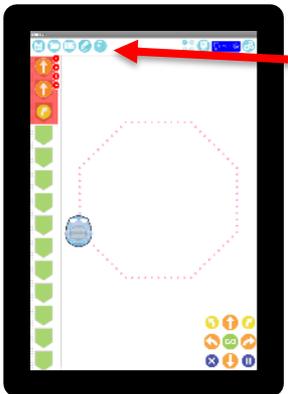


To add a command to the program either tap the command button once or drag it.



To move a command's position in the program drag it to a new position.

To remove a command, drag it from the program line and let go.



Repeat and 45° Mode

To repeat a command or a group of commands, tap the repeat button.

Tap in the red circle by the first command in the repeat sequence. Then tap in the circle by the last command in the repeat sequence. A red surrounding bar will appear. Use the + and - buttons to select the number of times the commands should be repeated.

45° degree turn

Note: In 45° mode the mat will be greyed out because Blue-Bot will not move a complete square at a time when rotated 45°.

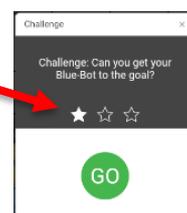
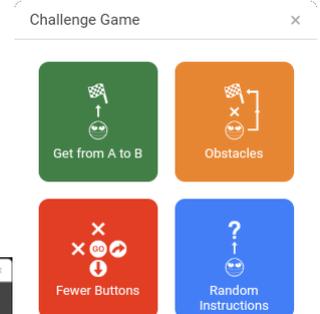
Challenge Mode

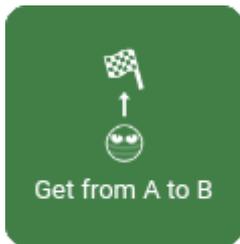
There are four different types of challenge:

1. Get from A to B
2. Obstacles
3. Fewer Buttons
4. Random Instructions

Difficulty Levels – For each type of challenge there are 3 levels. The level is selected using stars which can be seen when a challenge is opened.

1. Get from A to B





Get from A to B

From a random starting point write a program to reach the destination flag. These challenges deliberately do not say if you fail to complete them. Keep trying until you succeed. There is no single correct answer. As long as the destination is reached you have succeeded.

Write a program to get to the destination.

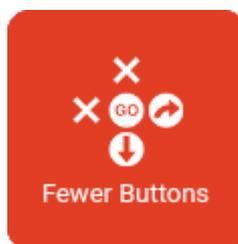


Obstacles

2. Obstacles

These challenges are similar to those in 'Get from A to B' but are made trickier by including obstacles. Again the challenges do not say if you fail to complete them. Keep trying until you succeed. There is no single correct answer. As long as the destination is reached you have succeeded.

Write a program to avoid the obstacles and reach the destination.

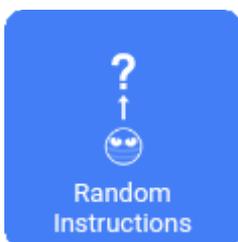


Fewer Buttons

3. Fewer Buttons

One or two command buttons are removed and the challenges need to be solved without them. These challenges do not say if you fail to complete them. Keep trying until you succeed. There is no single correct answer. As long as the destination is reached you have succeeded.

Write a program to get to the destination flag without all the command buttons being available.

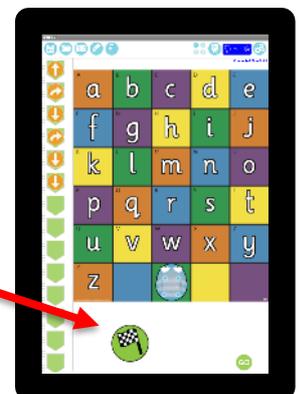


Random Instructions

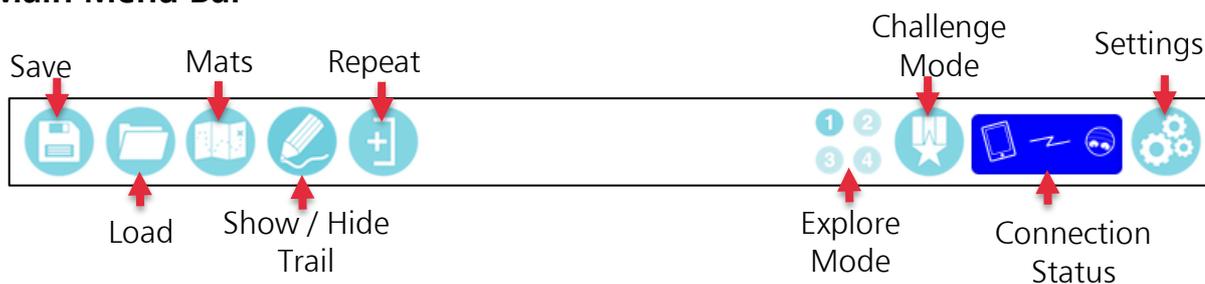
4. Random Instructions

Read a simple program and predict what it will do.

Read the program and predict where Blue-Bot will end up. Drag the destination flag to where you think that will be.



Main Menu Bar



Saving and Loading

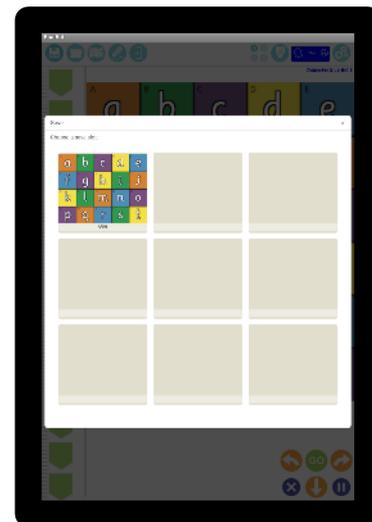
To save a program:

1. Tap the save icon
2. Tap on a save slot
3. Type in a name for the program
4. Tap save

To open a saved program:

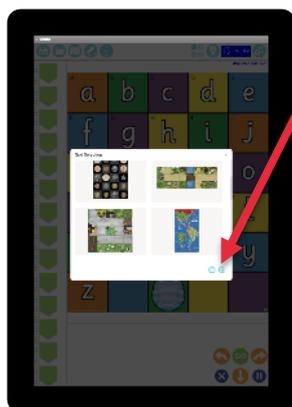
1. Tap load
2. Tap on the file to load

NB There are nine save slots available.

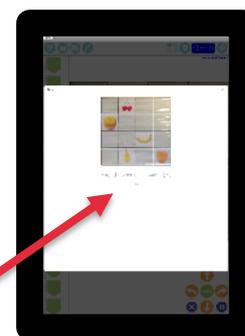


Mats

Tap on a mat to select OR to photograph your own mat:



1. Tap the **camera icon**.
2. Take a photo of the mat.
Try to get it as centred as possible.
3. Tap + - to select the correct number of grid squares. Drag with two fingers to change the alignment, then tap **Save**.



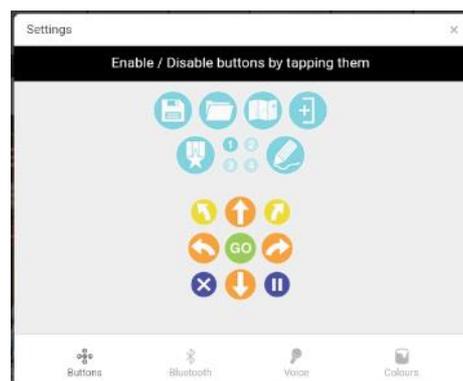
4. The photographed mat is now ready to be used.

For future use (or deletion) photographed mats will appear at the bottom of the mat selection page.

Settings

Show / Hide Buttons

Buttons may be hidden or unhidden by tapping on them. For example, the mats button could be switched off making it more difficult for children to change mats and therefore remain focussed on one.

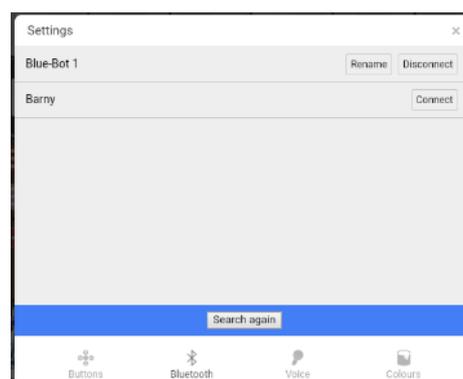


Connect, disconnect and rename Blue-Bot

Connect or disconnect from a Blue-Bot using the slide switches. A Blue-Bot can only be connected to one device at a time.

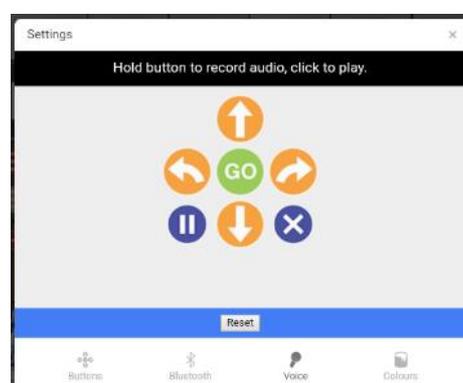
To rename a Blue-Bot you must be connected to it. Tap on 'Rename', enter a new name and tap on 'Rename' again. Blue-Bot will disconnect and should reappear in the list with a new name.

Blue-Bots can be renamed to help with classroom management. You might also add a small label or number plate to each Blue-Bot to easily identify which is which.



Voice Recorder

This screen allows a recording to be made for each button. As Blue-Bot moves the recording will be played back. For example the word "forward" could be recorded for the forward button. Recording a voice or sound for each command will enable auditory feedback and will help reinforce the use and understanding of particular commands and language.

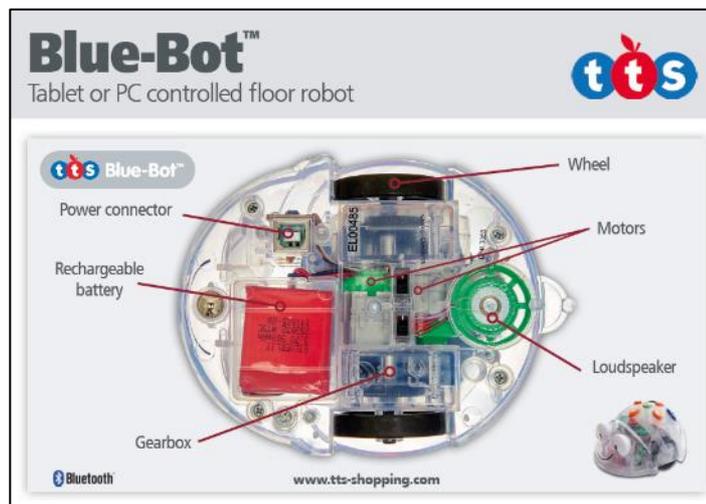
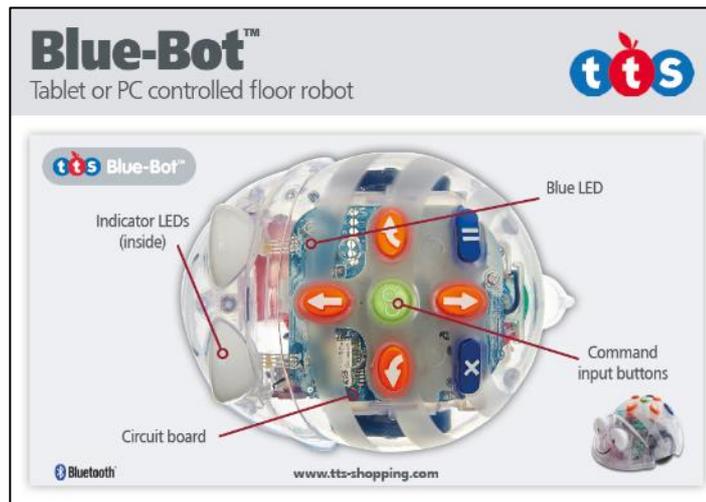


Interface Colours

This page allows the screen background colour to be changed. It also allows the button colour to be changed. Tap on the colours or buttons to select them. Changing the colours used may make the screen clearer for users with specific visual needs.



Download free Blue-Bot posters from the TTS Website. Available in A3 or A4.



Technical Support

Please visit www.tts-group.co.uk for the latest product information.

Email feedback@tts-group.co.uk for technical support.

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