BEE BOT AND BLUE BOT

DESCRIPTION:

Bee-Bots and Blue-Bots are floor-based robots with 4 directional keys (forward, backward, turn right, turn left) that can be used to program a sequence of commands. The Blue-Bot build on the capabilities of the Bee-Bot by adding Bluetooth compatibility allowing it to also be programmed using a proprietary card-based system, or the Blue-Bot app.

These robots are useful for helping teach early computing and programming, with a simple child-friendly layout providing a starting point for teaching control, sequencing, directional language and algorithms.

https://www.researchgate.net/figure/Bee-BotR-Robot-description-of-buttons-and-their-functions-Source-Own-elaboration_Fig5_340286025

MANUFACTURER RECOMMENDED AGE RANGE: 3+ YEARS
SAFETY INFORMATION:

Always examine the Bee-Bot/Blue-Bot before using. If you find any faults or damage do not use the Bee-Bot/Blue-Bot and contact the supplier immediately.

**Mechanical**
- Keep fingers, hair, and loose articles of clothing clear of moving parts
- Never pick up the Bee-Bot/Blue-Bot while it is moving, or any motors are running
- Keep the Bee-Bot/Blue-Bot away from direct sunlight and heat

**Electrical**
- Do not operate in a wet environment or with wet hands
- Regularly examine for damage the plug, enclosure and other parts. In the event of any damage, the robot and charger must not be used until the damage has been repaired
- Do not allow the Bee-Bot/Blue-Bot to come into contact with water or other liquids. If painting or gluing on the additional shells, ensure the shells are dry before clipping to your Bee-Bot/Blue-Bot

**Batteries**

**Bee-Bot**
- Only use zinc-carbon or alkaline batteries with the Bee-Bot/Blue-Bot and do not mix battery types or new and used batteries
- Use batteries of the same or equivalent type of those recommended and insert the correct way round
- Remove batteries before storing the Bee-Bot
- Non-rechargeable batteries are not to be recharged
- Rechargeable batteries are only to be charged under adult supervision
- The battery is located under a removable hatch held in place by a security screw.

**Blue Bot**
- Blue-Bot is powered by a DC 3.7V 500mAh Lithium Polymer rechargeable battery
- Rechargeable batteries are only to be charged under adult supervision
- The supply terminals are not to be short-circuited
- Regularly examine for damage to the plug enclosure and other parts
- In the event of any damage, the Blue-Bot and charger must not be used until the damage has been repaired

**Cleaning**
- Always clean hands and surfaces before using the Bee-Bot/Blue-Bot
- If necessary, wipe the Bee-Bot/Blue-Bot gently with a clean damp cloth
- Keep Bee Bot/Blue-Bot away from direct sunlight and heat
INPUTS/SENSORS:

- Forward button - Programs the robot to move one space forward
- Backward button - Programs the robot to move one space backwards
- Left turn button - Programs the robot to turn left at a 90-degree angle
- Right turn button – Programs the robot to turn right at a 90-degree angle
- Pause button – Programs the robot to pause for one second
- Cross button – Clears the programming memory
- Go button – Starts the program

OUTPUTS/ACTIONS:

- Motors – allow the robot to have multi-directional movement
- Lights – the lights in the robot’s eyes light up to show its status
- Sound – the robot makes noises to indicate its status

PROCESSING/PROGRAMMING:

Bee-Bots and Blue-Bots have been designed as a simple floor robots. After initial switch-on, the sequence memory is cleared, pressing Go at this point will simply cause a sound to be played and no motion to occur. The user can press a sequence of commands, which are stored in the sequence memory. A maximum of 40 (Bee-Bot)/200 (Blue-Bot) commands can be stored; each command being either one forward/backward movement, left/right turn, or a pause.

A Blue-Bot app is available for Android, iOS, Windows 7+ and Mac OS X to expand the core functionality of the robot. The tablet app can be downloaded from Google Play or iTunes. The app for Windows, Mac OS X will be available on the TTS Website. The app expands programming options to also include repeats and 45° turns, along with providing a number of challenges for students to complete.

The Blue-Bot can also be programmed using a Bluetooth connected TacTile Reader, allowing students to lay out their programming steps by placing the tiles in sequence into the reader. Each reader can hold up to 10 tiles (representing 10 steps) and up to 3 readers can be connected together to allow for programming sequences of up to 30 steps. Tiles are available for all of the basic movements (forward, backward, left, right, pause) along with repeat and 45° turns. The TacTile Reader introduces remote programming without the complications of apps and tablets, making learning to code a direct, hands-on experience.
TIPS AND HINTS:

- Each forward or backward command causes the unit to move approximately 150mm in the required direction
- Each turn command causes the robot to rotate 90° in the required direction in the same location
- A pause command causes the unit to wait for 1 second
- Pressing the Go button causes the robot to execute each stored command in sequence with a short delay between each command. A sound will be played at the end of the sequence
- Additional programming commands are added to the end of the current sequence unless the Clear button is pressed
- Sound can be turned on/off using the switch on the underside of the robot
- In the event of static, your Bee-Bot/Blue-Bot may malfunction. In this case, please switch it off and then back on again to reset it
- Battery life is approximately 8 hours in normal usage (depends mainly on amount of movement)
- Bee-Bot’s/Blue-Bot’s eyes are used to provide some basic information:
  - Solid Blue - connected via Bluetooth.
  - Solid Red - Charging.
  - Flashing Red - Low battery. Robot needs charging.
  - Solid Green - Fully charged.

Renaming Blue-Bot

Blue-Bot has the default Bluetooth name "Blue-Bot" which may result in confusions when using multiple Blue-Bots in the classroom setting. This name can be changed within the Blue-Bot app settings. When a name is changed this could be noted on Blue-Bot’s underside or perhaps as a small number plate to make identification easier for classroom management.

Pairing Blue-Bot

Bluetooth v4.0, Bluetooth Smart and BLE devices should not need to be paired with Blue-Bot. For devices without Bluetooth v.4.0, Smart and BLE the Blue-Bot app will establish a connection when it is needed. 1. Locate the Bluetooth settings on your device. 2. Switch Bluetooth on and search for nearby devices. 3. Turn Blue-Bot on to make it discoverable with your device. 4. Blue-Bot will appear on the list of devices available. 5. Select Blue-Bot on the list to pair with. Once Blue-Bot has paired it can be controlled from the Blue-Bot app / software.
ACTIVITY IDEAS:

Digital Systems:
- Introduce students to Bee-Bots/Blue-Bots, using specific vocabulary associated with programming and understanding that they can control the device by creating simple algorithms.
- Students develop materials (pamphlet, video, etc) to explain how the robot works to others (peers, younger students, grandparents, etc)
  https://inteact.act.edu.au/teaching-and-learning-resources/understanding-computer-hardware/

Data:
- Students create maps for the Bee-Bots/Blue-Bots using their knowledge to represent data as pictures, symbols and diagrams.

Digital Solutions:
- Students write a set of instructions and use directional language as they direct the Bee-Bot/Blue-Bot to move in different directions or perform a choreographed dance routine.
  https://www.fizzicseducation.com.au/articles/5-ways-beebots-can-teach-students/
  http://www.learningismessy.com/coding/bee-bot-collaborative-dance/
- Students program the Bee-Bot/Blue-Bot to consolidate their mathematical understandings.
- Students use sequence cards or TacTiles to plan out a route to expressively retell a narrative or guide an informative text
  https://sites.google.com/sfusd.edu/k-2cs/red/unit-2-bee-bots/11-retelling-fairy-tales-4-6-story-squares
  https://app.seesaw.me/activities/zf4bmc/how-can-bee-bot-tell-a-story

Collaboration and Protocols:
- Students play games using the Bee-Bot/Blue-Bot including a variety of online safety “Dos and Don’ts”
  https://www.barefootcomputing.org/resources/safety-snakes