Blue Bots: Alphabet and shape designs

Year level band: F-2

Description: This learning sequence allows students to explore how BlueBot robots work. Using the buttons students can identify a simple user interface and how it works. By controlling the bees through the buttons and recording the process students are following and describing simple sequences of steps.

The lesson then moves on to using the BlueBot App to plan and control the BlueBot to trace a letter (or shape)

Resources:

- Blue Bots (1 per group of 2 students)
- iPads/computers (1 per group), with apps installed:
  - Blue Bot
- Bee Bot / Blue Bot mats
- Poster paper, pens, markers, etc
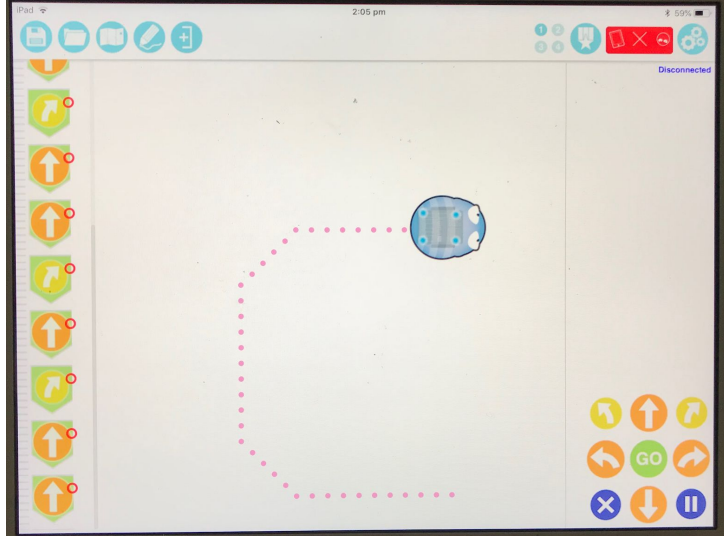
Prior Student Learning:

- Students may have had experience working with Blue Bot's little brother, the Bee Bot.

In this lesson students have the opportunity to expand on their previous knowledge of a Bee Bot and are introduced to a the Blue Bot. They will explore the process of creating an algorithm to trace a letter shape.	
Year	**Content Descriptors**
F-2	Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems (ACTDIP004) Listen for specific purposes and information, including instructions, and extend students' own and others' ideas in discussions (ACELY1666) Recognise and explore patterns in data and represent data as pictures, symbols and diagrams (ACTDIK002)

Element	Summary of tasks
Learning hook	Introduce that we are going to program a BlueBot to trace out the letters of their name (starting with first letter).

	Ask students to firstly draw their letter but only use straight lines - use whiteboards or paper.
Achievement Standards	By the end of Year 2, students identify how common digital systems (hardware and software) are used to meet specific purposes. They use digital systems to represent simple patterns in data in different ways. Students design solutions to simple problems using a sequence of steps and decisions. They collect familiar data and display them to convey meaning. They create and organise ideas and information using information systems, and share information in safe online environments.
Learning Map (Sequence)	● Students draw the first letter of their name. ● Students provide instructions for how to draw the first letter of their name for a peer to follow. ● Students create an algorithm for their BlueBot to follow.
Learning input	The teacher models using the level of language and measurement, location language suitable for the class group. "I am going to write the algorithm for the BlueBot to draw the letter C." The teacher uses BeeBot instruction cards to create the correct sequence. Working in pairs. Students give oral instructions to one another to get their partner to draw a shape or letter (using straight lines).
Learning construction	1. Students have their letter that they created earlier. 2. Students use BlueBot (BeeBot) instruction cards to plan an algorithm to represent the verbal instructions. Test and de-bug. 3. Using BlueBot buttons, create a similar plan and execute, as well as test and debug. 4. Using the BlueBot App, create a similar algorithm and execute, as well as test and de-bug. It is possible that the students will not use the 45 degree angles in this activity but the teacher can decide whether to extend if suitable.
Learning demo	Students demonstrate their BlueBot tracing their letter.

	As an extension, students are invited to consider: *Could we create the algorithm another way to draw the same letter?*
Learning reflection	Students reflect on: Did the Bluebot create their letter correctly? What worked? What did they need to fix? Students could record a video of their BlueBot tracing their letter and share or save this in a safe school online environment.

Assessment:

Formative assessment:

- Teacher observe students contributions to discussions.
- Use questioning to elicit student understanding of the functions of the Blue Bot.
- Teacher observes student contributions to group work.
- Teacher could record video of the students implementing their BeeBot creating their letter.

	Quantity of knowledge			Quality of understanding	
Criteria	Pre-structural	Uni-structural	Multi-structural	Relational	Extended abstract
Algorithms	Design not implemented.	Design works with basic algorithm.	Design allows for Blue Bot functions to be used in algorithm design.	Design allows to all Blue Bot functions to be used in algorithm design.	Design allows to all Blue Bot functions to be used in algorithm design, and going beyond the design brief.
Vocabulary	When describing algorithm, no specific vocabulary is used	The term instruction may be used as a general description	The term algorithm is used as a general description	The term algorithm is used confidently with specific reference to learner's work	Specific vocabulary like decisions and repetition is used, going beyond the set language

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CSER Professional Learning:

This lesson plan corresponds to professional learning in the following CSER Digital Technologies MOOCs:

F-6 Digital Technologies: Foundations. See: http://csermoocs.adelaide.edu.au/moocs

● Unit 7: Algorithms and Programming

● Unit 8: Visual Programming

Further Resources:

- Digital Technologies Hub: www.digitaltechnologieshub.edu.au
- CSER: https://csermoocs.adelaide.edu.au

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