# Blue Bots Shape Up

#### 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 move along a horizontal or vertical axis or around a floor mat or maze.

#### **Resources:**

- Blue Bots (1 per group of 2 students)
- iPads/computers (1 per group), with apps installed:
   <u>Blue Bot</u>
- Bee Bot / Blue Bot shape mats
- Poster paper, pens, markers, etc
- Tangram Template

#### **Prior Student Learning:**

• Students may have had experience working with a Bee Bot.

#### Summary

In this lesson students have the opportunity to expand on their previous knowledge of a Bee Bot and are introduced to a Blue Bot. They will explore the process of creating an algorithm to trace a letter shape.

Year	Content Descriptors						
F-2	Digital Technologies						
	Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems (ACTDIP004) Recognise and explore patterns in data and represent data as pictures, symbols and diagrams (ACTDIK002)						
	English						
	Listen for specific purposes and information, including instructions, and extend students' own and others' ideas in discussions (ACELY1666)						

Element	Summary of tasks



Learning hook Achievement Standards	<ul> <li>Introduce students to a Tangram puzzle and show them how the individual puzzle shapes can be used in sequence to create an algorithm.</li> <li>Students will cut out shapes for their own puzzle pieces and follow teacher algorithms to make interesting shapes.</li> <li>They will then create their own algorithms.</li> <li>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.</li> <li>Students design solutions to simple problems using a sequence of steps</li> </ul>					
	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)	<ul> <li>Students cut out their own shapes to create algorithms.</li> <li>Students use their shapes as markers for navigating their BlueBot along a horizontal or vertical line.</li> <li>Students use printable directional cards to provide a written list of instructions to describe Blue-Bot's movements.</li> <li>Students use these cards to write an algorithm 'in app'.</li> <li>Students repeat the navigation activity using a grid or floor mat using more directions, including 45 degree turns, in their instructions.</li> <li>Students use printable directional cards to provide more explicit instructions for BlueBot navigation and 'in app 'programming.</li> <li>Coordinates and compass directions can also be introduced.</li> </ul>					
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 travel from GO to the red triangle." The teacher uses BeeBot instruction cards to create the correct sequence. Working in pairs. Students create their own written algorithms for programming each other and the BlueBot both physically and in-app.					
Learning construction	<ol> <li>Students cut their tangram puzzle shapes.</li> <li>Students use BlueBot (BeeBot) instruction cards to plan an algorithm to represent the verbal instructions. Test on a partner and de-bug.</li> <li>Students use BlueBot buttons to recreate the program manually for BlueBot to execute.</li> <li>Using the BlueBot App, they will create a similar algorithm and execute. They will test and de-bug as necessary.</li> <li>The teacher can introduce 45 degree turns when appropriate.</li> </ol>					
Learning demo	Students demonstrate their BlueBot moving to and around their shapes. As an extension, students are invited to consider:					



	Could we create the algorithm another way to navigate to the shape? Can we make 'cleaner' code? How?	
Learning reflection	Students reflect on: Did the BlueBot follow the most direct path to the shape? Were they successful when programming the app with the same instructions? What did they need to fix or debug their program?	
	Students could record a video of their BlueBot moving around the shape. As an extension activity, they could put the BlueBot algorithm to music.	

#### Assessment:

Formative assessment:

Teacher:

- Observes student contributions to discussions.
- Uses questioning to elicit student understanding of the functions of the Blue Bot.
- Observes student contributions to group work.
- Records a video of the students implementing Blue-Bot algorithms.

	Quantity of knowledge			Quality of understanding	
Criteria	Pre-structural	Uni-structu ral	Multi-structu ral	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



## **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: <u>https://csermoocs.adelaide.edu.au</u>

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