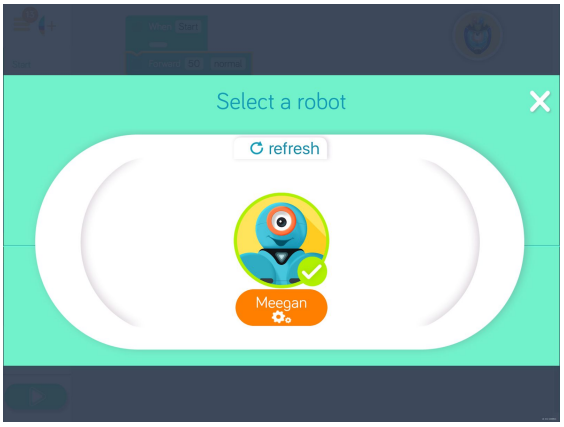
Title: Hide and Seek with Dash

Year level band: 3-4

Description: In this learning activity students use coordinates to help them program the Dash robot and play a game similar to Battleships (but without the bombing!). They learn some basic programming instructions using the Blockly App by Make Wonder.

Resources:
Dash Robot
One iPad or tablet per group with the MakeWonder Blockly App Downloaded
5 X 5 grid in 20 cm intervals
Masking tape
playing cards
Desks
Student names on card
Student worksheet here.

Prior Student Learning: Some experience playing with the Dash Robot and naming their robots prior to the lesson. (named Dash robots allows multiple robots to be paired with devices - open the cog symbol and rename). Some understanding of grids and coordinates.



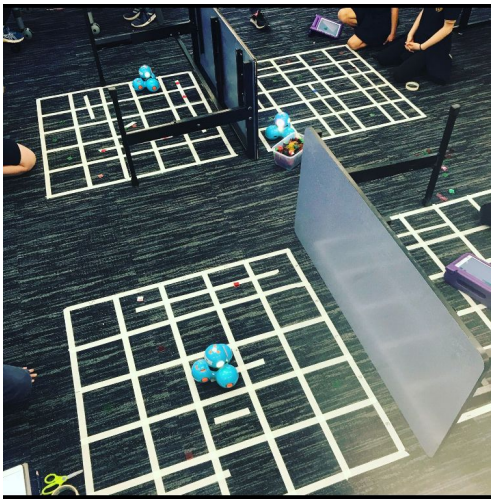
Australian Curriculum alignment summary

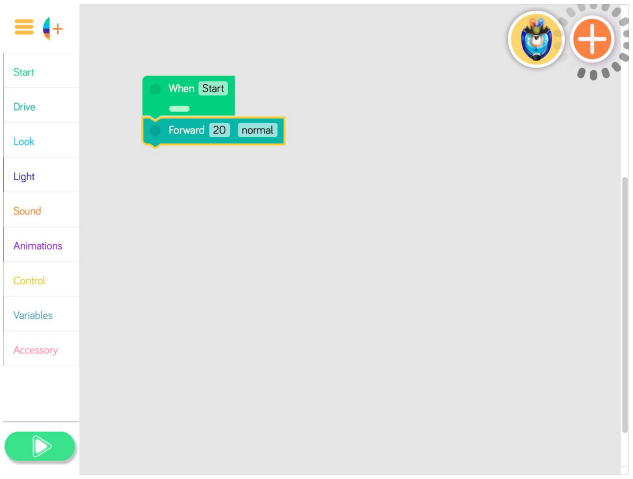
Digital Technologies: Students develop solutions to coordinate problems using appropriate software including visual programming languages that use graphical elements rather than text instructions.
Mathematics: Students are involved in interpreting maps and communicating positions.

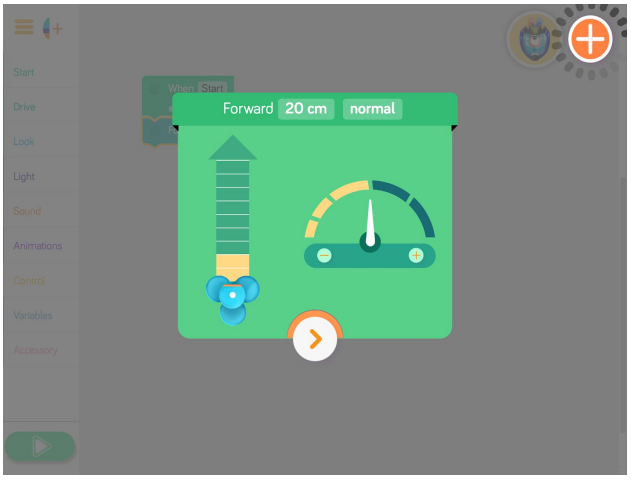
Year	Content Descriptors
3/4	**Digital technologies:** By the end of year 4: Students implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011). **Mathematics:** Year 3: Create and interpret simple grid maps to show position and pathways Year 4: Use simple scales, legends and directions to interpret information contained in basic maps **Proficiencies:** **Reasoning:** includes using generalising from number properties and results of calculations, deriving strategies for unfamiliar multiplication and division

	tasks, comparing angles, communicating information using graphical displays and evaluating the appropriateness of different displays.
	Capabilities **Numeracy** Interpret maps and diagrams interpret information, locate positions and describe routes on maps and diagrams using simple scales, legends and directional language

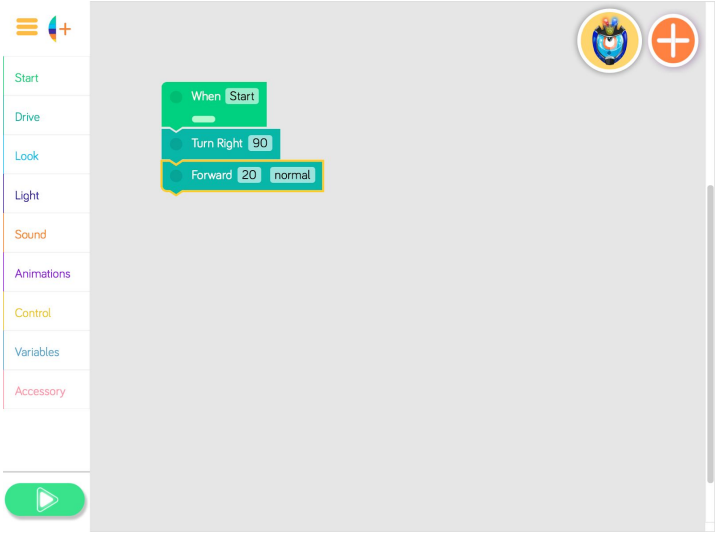
Element	**Summary of tasks**
Learning hook	Play a pen and paper game of hide and seek using grid paper to mark coordinates and in a whole class discussion, invite students to share the strategies they used. Find a worksheet here. ● The teacher explains and models to the whole class the game and how to locate a position on a five by five grid. ● The teacher draws attention to X and Y axis ● Students practice using pen and paper in partners.
Achievement Standards	**Digital Technologies** By the end of year 4: Students define simple problems, design and implement digital solutions using algorithms that involve decision-making and user input. **Mathematics** Year 3 They match positions on maps with given information. Students recognise angles in real situations. Year 4 They interpret information contained in maps. They classify angles in relation to a right angle.
Learning Map (Sequence)	● Students develop an understanding of coordinates used to map movement and location and position. ● Students begin to play with angles to try and get Dash to the correct location. ● Students use a simple visual block programming environment to get Dash to the correct location.
Learning input	How could we use a robot to play this game? Teacher explains how we will play the same game with a Dash Robot. Tape out a five by five grid on the floor and play a giant version of the game with Dash. This photo shows a game of Battleships but if you prefer not to introduce bombing you could write names across the tape, put name cards in boxes or have the collection of items (such as fruit and vegetables, animals, playing cards or sight words). Use desks for barriers.

	
Learning construction	After the teacher has modelled coordinates on a 5X5 grid they can then move onto demonstrating how to program the Dash Robot using Blockly on the App. Using a 5X5 grid on the floor the teacher places playing cards in each of the squares. Students take turns in calling out the card they want Dash to land on. Then the students have a turn themselves, modelling in front of the whole group and troubleshooting together. This could be modelled using a whiteboard reflection of the tablet screen how to move the robot to a certain square on the grid. Students get to know the commands, noting: ● When Start (is conditional statement) ● Forward (if altering the number to 20cm, the teacher could explain that because we can change the value here it is a “variable”).





Students calculate the number of spaces they want to move by skip counting with 20 or by one lot of 20 at a time. (Different access points for different levels of numeracy)

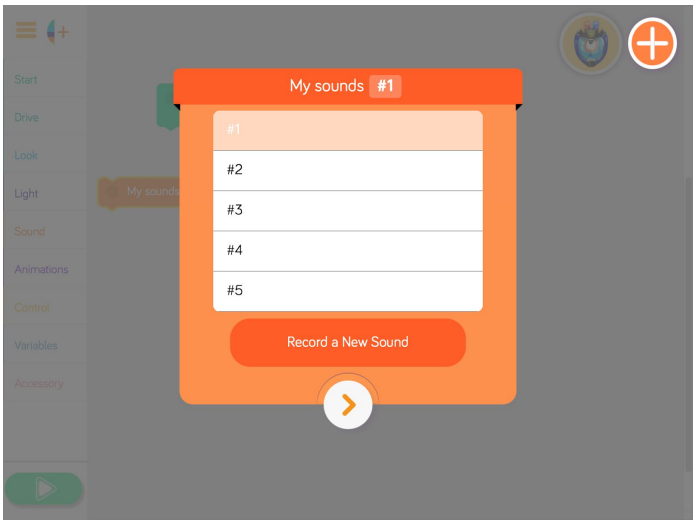


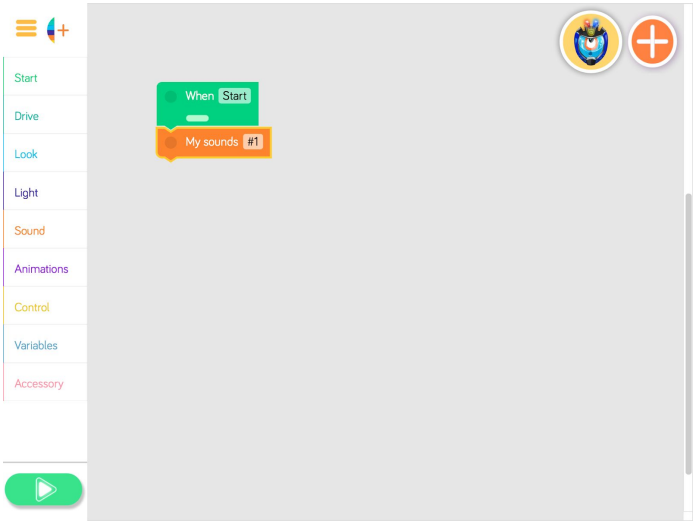
Students play with the angles to see that the right angle is the best choice when working in grids.

Once students are confident they can move onto playing hide and seek in teams using the battleships type game.

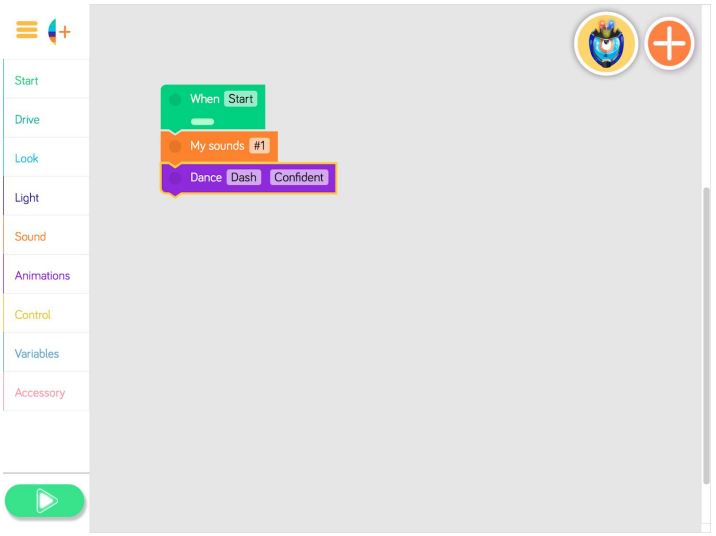
They pair a robot with their tablet and the other team places it on their grid at 1:1.

They take turns moving the robot to different squares and asking if they found anyone, as in the paper version. Students could experiment with recording a victory sound when they successfully find a name.





….or by doing a victory dance!

	
Learning demo	Students demonstrate their understanding by each taking a turn to program the robot to arrive at a certain square. The teacher observes and notes the students troubleshooting and programming skills.
Learning reflection	The teacher takes photos of the floor game of Hide and Seek and displays them. The students add comments to the photos with post-its reflecting on what they learned.

Assessment:

- Teacher takes photos of students undertaking activities.
- Student reflections on what they have learned (content knowledge and skills).

	Quantity of knowledge			**Quality of understanding**	
Criteria	**Pre-structural**	**Uni-structural**	**Multi-structural**	**Relational**	**Extended abstract**
Visual Programming	Places visual blocks in the work space without considering how this will affect the robot	Places visual blocks in the work space and tests them out on the robot. Through trial and error moves the robot to a space.	Places visual blocks intentionally within the workspace to create an algorithm. Uses conditional statements Algorithm is designed to	Visual program (algorithm) uses two or more blocks in the correct sequence to achieve the task. Uses conditional statements to support the robot to decide what to	Visual program uses a complex sequence of commands (algorithm) to achieve the task efficiently. Student innovates on the program to develop their own more efficient algorithm. Uses

			move the robot to a specific grid location. Algorithm could be refined to use fewer blocks.	when it comes to an obstacle. Algorithm is efficiently designed with the least amount of blocks to move the robot to a specific grid location.	conditional statements to support the robot to decide what to when it comes to an obstacle. Algorithm is efficiently designed with the least amount of blocks to move the robot to a specific grid location.
Coordinates	Uses verbal description instead of coordinates to identify spaces	Uses coordinates to identify spaces.	Uses coordinates and angles to identify a place for the robot to land.	Able to identify spaces on a grid using coordinates.	Able to plot a path using multiple coordinate locations.

Teacher/Student Instructions:

Practising with Dash using the Make Wonder sequences of learning would be useful.

https://www.ednology.com/resource/download/dash-dot-00-blockly.pdf

CSER Professional Learning:

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

F-6 Digital Technologies: Foundations

https://csermoocs.adelaide.edu.au/moocs/

Unit 7: Visual programming

Further Resources:

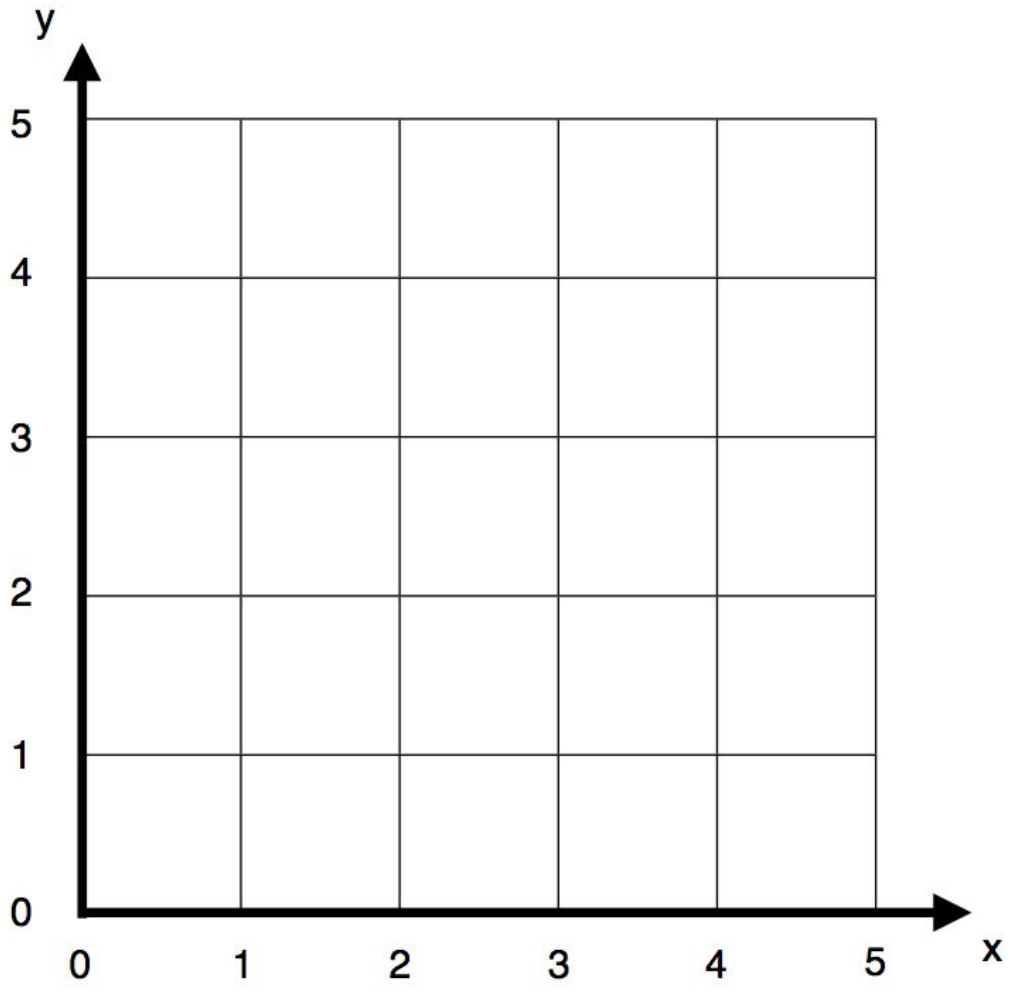
Lesson adapted from Meg McLeod - Kilkenny Primary School, SA

Make Wonder Website: https://education.makewonder.com/curriculum/learn-to-code

Where am I hiding?

Game play
2 Players
5X5 grid

Create a barrier between the two players. Each player records the names of five friends in random boxes. Don't let anyone see! Player one calls out coordinates and says "have I found someone?" Player 2 looks to see if there is a name in the box. Answer with "Yes you found ....." or "No, nobody here!" Then swap over.



Author: Karen Butler