

Computational Thinking in Action

A catalyst for growth and extension of Computational Thinking in the classroom.

What is Computational Thinking?

Computational Thinking is a set of skills that underpin learning within the Digital Technologies classroom. These skills allow students to engage with processes, techniques and digital systems to create improved solutions to address specific problems, opportunities or needs.

The six Computational Thinking skills:



DECOMPOSITION

Breaking down data, processes, or problems into smaller, manageable parts.



PATTERN RECOGNITION

Observing patterns, trends, and regularities to make sense of data.



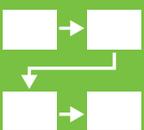
ABSTRACTION

Identifying and extracting relevant information.
The process of ignoring or removing unnecessary information.



MODELLING AND SIMULATION

Developing a model to imitate processes and problems.



ALGORITHMS

Creating an ordered series of instructions for solving similar problems or for doing a task.



EVALUATION

Determining the effectiveness of a solution and generalising.
Applying that information to new problems.

Thinking about Computational Thinking

Sort

Computational Thinking Skills

Not important in the problem or solution

Important but not critical in the problem or solution

Critical in solving the problem or creating the solution

Compare

Strategies



Challenges and successes



Other students' strategies



Wider problems and solutions

Apply

Understanding

Explore real-world examples



Create designs and projects



Present and communicate findings



Rubbish robots



Years 3-4
Years 5-6



Individual



30 minutes



Ozobot
Coloured markers
Extra paper
Rubbish Maze
Ipad

Student Instructions

Write a single algorithm that can move your rubbish robot through the maze to pick up the **maximum** amount of rubbish.

Rubbish robot practice

Rubbish robots receive algorithms by identifying colour pen used as an **input**.

Place the Ozobot on the line

Colour the blank spaces with your colour code

Record the output in the table below

When the Ozobot identifies colour it changes direction or the colour of it's lights as the **Output**.

Rubbish robot Outputs

Describe what the rubbish robot does when it rolls over the different colours.

		COMBO <input type="text"/> <input type="text"/> <input type="text"/> OUTPUT
<input type="text"/>	<input type="text"/>	<input type="text"/>
		COMBO <input type="text"/> <input type="text"/> <input type="text"/> OUTPUT
<input type="text"/>	<input type="text"/>	<input type="text"/>

Rubbish robot maze

Now that you know how to code your rubbish robots, design an algorithm that will pick up the largest amount of rubbish before leaving the maze. The robot can only **enter once** and can only **exit once**. So think carefully about your start and finish points.

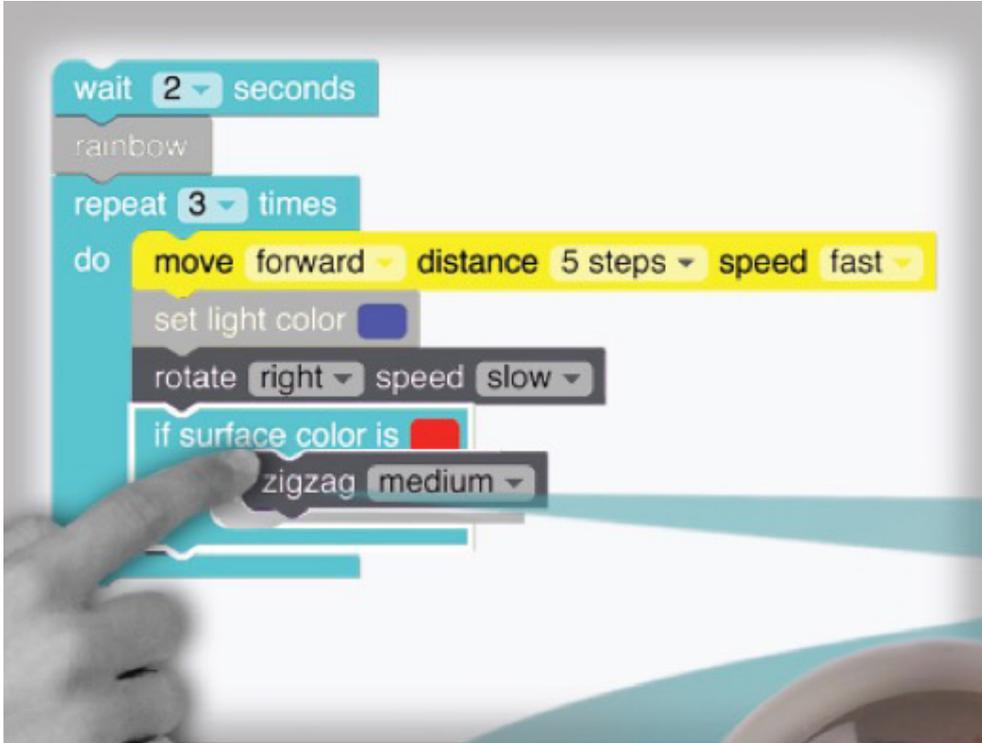


Rubbish robots: extension

Make your algorithm digital

Using the Ipad see if you can code your rubbish robot with a block coding language.

For Ozobot tutorials please go to this link ozoblockly.com



For more information and the latest news on plastic pollution solutions, visit: digitalcareers.csiro.au/links

Design a rubbish robot to tackle plastic waste in your schoolyard.

Use a design thinking process to create your own robot



Submit your design to YICTE!

www.youngictexplorers.net.au