

# LEARN ABOUT TECH WITH MAKEY MAKEY

Levels 3-4



This unit of work was created in collaboration with teachers

from Mackay Christian College, Queensland.

## Unit Overview

This unit explores digital systems and algorithms using Makey Makey. Students will identify and explain peripheral device in the context of Makey Makey and connecting the Makey Makey to explore and investigate the transmission of data. The unit will move onto students developing their coding skills by completing a range of Makey Makey activities. These activities focus on developing knowledge with the coding commands of user input and branching. Students will use this knowledge to help them complete a range of Makey Makey activities.

## Other Curriculum Targeted Areas

Other curriculum areas can be targeted and assessed within this unit. Areas of interest may include:

- Design and Technologies

Further investigation into these areas is required to ensure they align with the following activities. Activities may need to be modified to ensure Content Descriptions and Achievement Standards are met.

## Australian Curriculum Alignment

The following sessions have been created using the Australian Curriculum: Digital Technologies Curriculum. Activities may need to be modified to ensure state Digital Technologies Curriculum Standards/Syllabus are met. ACS has support and documents to help align this unit to other Digital Technology Curricular.

## Session

'Session' has been used to define the order of tasks to complete the unit. It does not define a set time required to complete the task. Time allocated to complete a session is the teacher's discretion. This allows for flexibility for to drive the duration of the task and make modifications if necessary. Sessions can be merged into one allocated class period or may run over multiple periods.

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## Key Preparation

### Digital Devices

This unit of work has been created with a focus of using Makey Makey as the main device. The lessons and resources do focus around the functions and features of Makey Makey. Preparation for using Makey Makey kits is required.

### ACS Resources

Resources have been created to help teachers and students unpack and understand topics found within the Digital Technologies Curriculum. These give brief explanations of the topic and the expectations to teach the topic at the curriculum year level. It is intended the information is presented in a way that will set the foundation for further research. ACS has resources to support the teaching of the Digital Technologies Curriculum from Foundation to Year 10. Access resources via: <https://www.acs.org.au/ict-educators.html>

## Key Understandings

Students will:

- Identify and explain common peripheral devices that are used with a Chromebook and extend to include Makey Makey kits.
- Follow a sequence of steps to complete Makey makey projects to explain and use the user input commands when coding the Makey Makey.

## Key Questions

- What are the common peripheral devices you use with your Chromebook?
- What happens when we connect a Makey Makey kit?
- What is user input and how do we code user input into our Makey Makey project?
- What is branching and how do we code branching into our Makey Makey projects?

## Key Vocabulary

Digital systems, peripheral devices, transmission of data, sequence of steps, algorithms, decision making, branching, user input, visual programming,

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher instruction	Whole class activity
1.	Collaboratively working online	<p><b>Learning Intention</b> Create and follow a set of protocols when completing the timeline online with their class.</p> <p><b>Success Criteria</b> Create a set of protocols and abide by these protocols when I am working online with my class.</p>	Commence a discussion on the type of behaviours that are important when working in groups. Transfer that knowledge and behaviours to working in online spaces. Discuss with the students if the behaviours are different or the same.	<p>Students break into small groups and identify the top five (5) protocols (rules) that they consider to be the most important. They group the protocols as either social or ethical.</p> <p>Each group presents their top 5 protocols. Together as a class decide on a what the top 5 protocols and consequences are when working in the online space. Students write out the rules and sign the agreement.</p>
<b>Session Resource</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li>ACS Student Resource: Online Collaboration</li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Online Collaboration</li> </ul>	
2.	Peripheral Devices	<p><b>Learning Intention</b> Students will explain the functions of different peripheral devices.</p> <p><b>Success Criteria</b> I can identify and categorise common peripheral devices.</p>	Revisit their laptop and identify the parts of the laptop. Once a list of parts has been created discuss the terms peripheral devices, input devices and output devices.	Students create a diagram that focuses on the different components of their Chromebook. Students look at the different peripheral devices and create a Venn Diagram to include categories of input devices and output devices.
<b>Session Resource</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li>ACS Student Resource: Peripheral Devices</li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Peripheral Devices</li> <li>ACS Teacher Resource: Peripheral Devices Image</li> </ul>	

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher instruction	Whole class activity
3.	Peripheral devices	<p><b>Learning Intention</b> Students will explain How Makey Makey is a peripheral device.</p> <p><b>Success Criteria</b> I can explain how Makey Makey is a peripheral device.</p>	Introduce to Makey Makey to the class. Discuss how Makey Makey is a peripheral device once it is connected to the laptop. In a group look at how the Makey Makey connects to the laptop.	Students add the Makey Makey components to their peripheral diagram created in the previous session. They explain the different features and components of Makey Makey.
<b>Session Resources</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li>ACS Student Resource: Peripheral Devices</li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Peripheral Devices</li> <li>ACS Teacher Resource: Peripheral Devices Image</li> </ul>	
4.	Visual Programming	<p><b>Learning Intention</b> Students will connect the Makey Makey to Scratch and code Makey Makey to complete a set of tasks.</p> <p><b>Success Criteria</b> I can follow a sequence of steps to connect and code the Makey Makey.</p>	Introduce the visual programming platform Scratch and the concept sequence of steps. Share with students the sequence of steps used to connect the Makey Makey and code with Scratch.	They complete the following activities to familiarise themselves with Makey Makey: <ol style="list-style-type: none"> <li>Control the Sprite with Makey Makey</li> <li>Make a sound with Makey Makey</li> </ol>
<b>Session Resources</b>	<p><b>Student Resources</b> ACS Student Resource:</p>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Visual Programming</li> <li><a href="#">Makey Makey – 3 Ways to Program Click with Scratch!</a></li> <li><a href="#">Digital Technologies Hub Scratch and Makey Makey Webinar</a></li> <li><a href="#">Makey Makey – First time set up</a></li> <li><a href="#">Makey Makey – Getting Started with Scratch</a></li> </ul>	

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher instruction	Whole class activity
5.	Sequence of steps - User input	<p><b>Learning Intention</b> Students will explore the term user input through completing the Makey Makey project of creating marshmallow piano.</p> <p><b>Success Criteria</b> I can use algorithmic term 'user input' and create a marshmallow piano.</p>	<p>Introduce students to user input concept. Discuss the definition and discuss with students how user input relates to the activity making a Makey Makey marshmallow piano.</p> <p>*User input occurs when the user will make the choice to press a key, only then will the marshmallow make a sound. The user also chooses which sound to play because each sound will be different.</p>	<p>In small groups students will create a marshmallow piano. Before they commence coding, the groups will decide what sound each key will make.</p> <p>Students will follow the instructions to code and create a marshmallow piano.</p>
<b>Session Resources</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li><a href="#">ACS Student Resource: Algorithms</a></li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Algorithms (focus only on user input).</li> <li>Marshmallows</li> <li><a href="https://www.youtube.com/watch?v=SNHOz6Zfu_o">https://www.youtube.com/watch?v=SNHOz6Zfu_o</a></li> <li><a href="https://scratch.mit.edu/projects/83107112/">https://scratch.mit.edu/projects/83107112/</a></li> </ul>	
6.	Sequence of steps - User Input	<p><b>Learning Intention</b> Students will explore the term user input through completing the Makey Makey project of drawing a family portrait and each image says something different.</p> <p><b>Success Criteria</b> I can use algorithmic term 'user input' and create a talking family portrait.</p>	<p>Recap on the term 'user input' and how this relates to coding.</p>	<p>Students draw a simple picture (outline only) of their family. Students create a list of sounds or phrases that their family may say or make.</p> <p>They record different sounds and phrases that each family will say. They connect the Makey Makey to Scratch and code to make each family say something different.</p>
<b>Session Resources</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li>ACS Student Resource: Algorithms (focus only on user input).</li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Algorithms (focus only on user input).</li> <li>Foil and paper</li> <li><a href="#">Instructables teachers – Interactive Art With Scratch and Makey Makey</a></li> <li><a href="https://makeymakey.com/blogs/how-to-instructions/getting-started-with-scratch">https://makeymakey.com/blogs/how-to-instructions/getting-started-with-scratch</a></li> </ul>	



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Session Number	Session Focus	Learning Intention and Success Criteria	Introduction/Teacher instruction	Whole class activity
7.	Sequence of steps - User Input	<p><b>Learning Intention</b> Students will explore the term branching through completing the Makey Makey project to create a switch.</p> <p><b>Success Criteria</b> I can use algorithmic term 'user input' and create a Makey Makey switch.</p>	Brainstorm with students all the different types of switches they use at home and in school (light switch, tv remote, keyboard etc) and identify what they control and discuss the switches as input devices and identify the output.	Students are provided with the materials to create a switch. Students choose between either making a switch from binder clips or a paper clip. Students follow the sequence of steps to create their switch. Once they have created their switch they experiment with Scratch to code different ways to use the switch (examples may include – say hello and make a sound).
<b>Session Resources</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li>ACS Student Resource: Algorithms (focus only on user input).</li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li><a href="#">Makey Makey – Crafting and Design Switches</a> (switches 3 and 4)</li> <li>Binders, paper clips foil and cardboard</li> </ul>	
8.	Sequence of Steps - Branching	<p><b>Learning Intention</b> Students will explore the term branching through completing the Makey Makey project to create a wire maze and when the person touches the wire a sound will be made.</p> <p><b>Success Criteria</b> I can use algorithmic term 'branching' and create a wire maze.</p>	<p>Introduce the concept of branching. Discuss the types of noises that can be made when a user touches the wire and when the user does not.</p> <p>*Branching occurs when there are two options - when the user hits the wire a noise will be made. When the user is not touching it remains quiet.</p>	<p>Students create a wire maze. They create a sound that will be made when they hit the wire maze.</p> <p>For an extension activity, students can create two sounds one sound when they are completing the maze without touch and the other when they hit the wire.</p>
<b>Session Resources</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li>ACS Student Resource: Algorithms (focus only on branching).</li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Algorithms (focus only on branching).</li> <li><a href="#">Instructables living – Make a Makey Makey Wire Maze</a></li> <li>Wire coat hanger (or wire that is easily bendable)</li> </ul>	

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Session Number	Session Focus	Learning Intention and Success Criteria	Introduction/Teacher instruction	Whole class activity
9.	Sequence of Steps - Branching	<p><b>Learning Intention</b> Students will explore the term branching through completing the Makey Makey project to create a tilt sensor. They will identify the different movements and sounds associated when the controller tilts.</p> <p><b>Success Criteria</b> I can use the algorithmic term 'branching' and create a tilt sensor.</p>	Discuss with students how the tilt sensor will complete different commands based on the direction it is pointing/moving. Discuss with students different purposes and coding options.	Students follow the instructions to create the tilt sensor. Students use Scratch to code different options when the sensor is tilted in different directions. This can include sounds/movements/changes in scenes.
<b>Session Resources</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li>ACS Student Resource: Algorithms (focus only on branching).</li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li><a href="#">Makey Makey – Tilt Sensor</a></li> </ul>	
10.	Sequence of Steps - Branching	<p><b>Learning Intention</b> Students will explore the term branching through completing the Makey Makey project of creating a door alarm.</p> <p><b>Success Criteria</b> I can use algorithmic term 'branching' and create a door alarm.</p>	Recap of the term branching and how it relates to coding. Look at how the door alarm will function and discuss the possible options when it is open and closed.	<p>Students create a Makey Makey door alarm. They create a sound that will be made when the door is open and closed.</p> <p>For an extension activity students can explore how to code once the door is closed.</p>
<b>Session Resources</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li>ACS Student Resource: Algorithms (focus only on branching).</li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Algorithms (focus only on branching).</li> <li><a href="#">Design and creating a Makey Makey alarm</a></li> </ul>	

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## Assessment – Australian Digital Technologies Curriculum

Content Description	Session Number	Assessment Piece	Assessment Statement
Identify and explore a range of digital systems with peripheral devices for different purposes, and transmit different types of data (ACTDIK007)	2 & 3	Explanation of Makey Makey	Students explored and explained how Makey Makey connected to the laptop and Scratch.
Recognise different types of data and explore how the same data can be represented in different ways (ACTDIK008)	N/A		
Collect, access and present different types of data using simple software to create information and solve problems (ACTDIP009)	N/A		
Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them (ACTDIP010)	4 – 7	Completion of Makey Makey activities	Students completed a range of Makey Makey activities. They followed sequence of steps to complete each task.
Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011)	7-10	Coding in Scratch	Students created simple programs by using the Makey Kits and using the visual programming platform scratch to complete different projects. They coded noises and movements to coincide with movement and buttons being pressed on the Makey Makey.
Explain how student solutions and existing information systems meet common personal, school or community needs (ACTDIP012)	N/A		
Plan, create and communicate ideas and information independently and with others, applying agreed ethical and social protocols (ACTDIP013)	1	Throughout the unit	Students created a set of protocols and abide by these protocols when working online with their peers to use and complete tasks using Makey Makey kits.



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## Assessment – Victorian Digital Technologies Curriculum

Content Description	Session Number	Assessment Piece	Assessment Statement
Explore a range of digital systems with peripheral devices for different purposes, and transmit different types of data (VCDTDS019)	2 & 3	Explanation of Makey Makey	Students explored and explained how Makey Makey connected to the laptop and Scratch.
Recognise different types of data and explore how the same data can be represented in different ways (VCDTDI020)	N/A		
Collect, access and present different types of data using simple software to create information and solve problems (VCDTDI021)	N/A		
Individually and with others, plan, create and communicate ideas and information safely, applying agreed ethical and social protocols (VCDTDI022)	1	Throughout the unit	Students created a set of protocols and abide by these protocols when working online with their peers to use and complete tasks using Makey Makey kits.
Define simple problems, and describe and follow a sequence of steps and decisions involving branching and user input (algorithms) needed to solve them (VCDTCD023)	4 – 7	Completion of Makey Makey activities	Students completed a range of Makey Makey activities. They followed sequence of steps to complete each task.
Develop simple solutions as visual programs (VCDTCD024)	7-10	Coding in Scratch	Students created simple programs by using the Makey Kits and using the visual programming platform scratch to complete different projects. They coded noises and movements to coincide with movement and buttons being pressed on the Makey Makey.
Explain how student-developed solutions and existing information systems meet common personal, school or community needs (VCDTCD025)	N/A		

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## Assessment – Western Australian Digital Technologies Syllabus

### Year 3

Content Description	Session Number	Assessment Piece	Assessment Statement
Digital systems and peripheral devices are used for different purposes (ACTDIK007)	2 & 3	Explanation of Makey Makey	Students explored and explained how Makey Maey connected to the laptop and Scratch.
Different types of data can be represented in different ways (ACTDIK008)	N/A		
Collect and present different types of data using simple software to create useful information (ACTDIP009)	N/A		
Use visually represented sequenced steps (algorithms), including steps with decisions made by the user (branching) (ACTDIP011)	7-10	Coding in Scratch	Students created simple programs by using the Makey Kits and using the visual programming platform scratch to complete different projects. They coded noises and movements to coincide with movement and buttons being pressed on the Makey Makey.
Create and communicate ideas and information safely (ACTDIP013)	N/A		
Create a sequence of steps to solve a given task (WATPPS16)	4 – 7	Completion of Makey Makey activities	Students completed a range of Makey Makey activities. They followed sequence of steps to complete each task.
Develop and communicate ideas using labelled drawings and appropriate technical terms (WATPPS17)	N/A		
Select, and safely use, appropriate components with given equipment to make a solution (WATPPS18)	7-10	Coding in Scratch	Students appropriately used the Makey Makey kits and Scratch to develop a programmable solution.

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## Assessment – Western Australian Digital Technologies Syllabus

### Year 4

Content Description	Session Number	Assessment Piece	Assessment Statement
Digital systems and peripheral devices are used for different purposes and can store and transmit different types of data (ACTDIK007)	2 & 3	Explanation of Makey Makey	Students explored and explained how Makey Maey connected to the laptop and Scratch.
Data can be represented in different ways (ACTDIK008)	N/A		
Collect and present different types of data for a specific purpose using software (ACTDIP009)	N/A		
Use simple visual programming environments that include a sequence of steps (algorithm) involving decisions made by the user (branching) (ACTDIP011)	7-10	Coding in Scratch	Students created simple programs by using the Makey Kits and using the visual programming platform scratch to complete different projects. They coded noises and movements to coincide with movement and buttons being pressed on the Makey Makey.
Create and communicate ideas and information safely, using agreed protocols (netiquette) (ACTDIP013)	1	Throughout the unit	Students created a set of protocols and abide by these protocols when working online with their peers to use and complete tasks using Makey Makey kits.
Define a sequence of steps to design a solution for a given task (WATPPS21)	4 – 7	Completion of Makey Makey activities	Students completed a range of Makey Makey activities. They followed sequence of steps to complete each task.
Identify and choose the appropriate resources from a given set (WATPPS22)	7-10	Coding in Scratch	Students appropriately used the Makey Makey kits and Scratch to develop a programmable solution.
Develop and communicate design ideas and decisions using annotated drawings and appropriate technical terms (WATPPS23)	N/A		
Select, and safely use, appropriate components and equipment to make solutions (WATPPS24)	7-10	Coding in Scratch	Students appropriately used the Makey Makey kits and Scratch to develop a programmable solution.
Use criteria to evaluate and justify simple design processes and solutions (WATPPS25)	N/A		
Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions (WATPPS26)			

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