

This unit of work was created in collaboration with teachers from St Francis of Assisi Primary School, Mill Park, Victoria.

### Unit Overview

This unit will complement a unit of work that investigates living things. Prior to this, students should have demonstrated knowledge and understanding of habitats and have inquired into an animal of their choice. They should be equipped with the necessary skills to identify the characteristics of an animal, its habitat and young. To incorporate the Digital Technologies Curriculum, students will evaluate current digital systems that are in place to help animals, especially those that are endangered. They will learn about and explore the digital technologies that are used to track and monitor animals. They will evaluate current technologies focusing on the strengths and weaknesses and use this information to design their own digital system. Students will design a 'new and improved' digital system for their animal. If a digital system does not exist for their chosen animal, they will adapt pre-existing systems. The design is in 2D format that will consist of drawings, labels and written information on how their new systems work through explicit instructions (algorithms).

### Curriculum Targeted Areas

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

- Science (Biological sciences)
- Design and Technology
- Critical and Creative Thinking

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

These activities have been created using the Australia Curriculum – Digital Technologies Curriculum. Activities may need to be modified to ensure state Digital Technologies Curriculum/Syllabus content descriptions and achievement standards are met. ACS have aligned the activities to the different curricula used across Australia, however it is recommended to verify the activities to ensure the targeted standards have been met.

### 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.

# DIGITAL TECHNOLOGY HELPING ANIMALS

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## Key Preparation

### 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.

### Digital Systems Examples to Promote Welfare

[Melbourne Water Frog Census](#)

[Cnet – Helping Save Endangered Species. There’s an App for That](#)

[App: Wild about whales](#)

[App: Fish Smart NSW](#)

[App: Horse Health Tracker app](#)

[Wild Life Act – Monitoring Tracking Technology](#)

[Wild Life Act video: Black Rhino Conservation with WWF](#)

[App: Sharksmart](#)

[Tree Hugger – Slide Show, Species and Habitats](#)

## Key Understandings

Students will:

- Identify the role of digital technology to monitor and help animals.
- Explain and evaluate how the digital system operates (looking at the hardware, software and the transmission of data).
- Design and explain their own digital system that uses current technology to improve the systems that are in place.

## Key Questions

- How is digital technology associated with animals?
- What digital technology is used to help animals?
- How does the digital technology operate?
- How is data collected and interpreted? Why is it important people gather this data?
- Is there a digital system that helps your animal? How does that system work? What parts would you keep and what parts would you change?
- What would your system look like?
- How would your system operate?

## Key Vocabulary

Data, transmit, networks, digital system, systems thinking, computational thinking, design thinking, design solution, hardware, software, algorithms, branching, user input

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
1.	Introduction	<p><b>Learning Intention</b> Students will identify digital technology that is commonly used in society.</p> <p><b>Success Criteria</b> I can identify different technology that I use. I can decide whether technology helps animals.</p>	Students brainstorm different types of technology and how they use that technology. Asking questions like What are your favourite apps? Devices? iPads, drones, go pros etc.	Students reflect and answer the question: Can digital technology help animals? Students record and attempt to explain their answer.
<b>Session Resources</b>	<b>Student Resources</b>		<b>Teacher Resources</b>	
2.	Making a connection with digital technology and animals	<p><b>Learning Intention</b> Students will evaluate current technologies that are used to monitor and assist animals.</p> <p><b>Success Criteria</b> I can identify and explain current technologies that are used to monitor and collect data about animals.</p>	Watch the video about tracking black rhinos and why it is important. Identify together the different type of technology that is used in the video and look at the actions people are doing (writing down data).	<p>Students are given a range of systems that are used to help different animals.</p> <p>They are given 10 minutes to look at the technology and create a table that covers:</p> <ul style="list-style-type: none"> <li>• A summary of the technology</li> <li>• The digital technology it uses</li> <li>• Data that it collects about the animal and how it is presented</li> </ul> <p>After they have filled out the first form, they pair up with another group. Students take in turns to summarise the technology that was used, how it it's used and some of the key components found on the devices. After a selected time, they move onto another group.</p>
<b>Session Resources</b>	<b>Student Resources</b>		<b>Teacher Resources</b>	
			<ul style="list-style-type: none"> <li>• ACS Teacher Resource: Peripheral Devices</li> <li>• Digital Systems Examples to Promote Welfare</li> </ul>	

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
3.	Collecting data	<p><b>Learning Intention</b> Students will use technology to collect data about animals.</p> <p><b>Success Criteria</b> I can collect data about an animal using a digital device.</p>	Why is it important to collect data about animals? What type of data should we collect? What do you think people do with that data?	<p>Explore an app that contains data about an animal. Activity for Frog Census App</p> <p>Students look through the data and begin to collate the data. Break up into groups and look at the data that has been found in each state. They take a small sample and create a tally, graph, Venn diagram to show their data.</p> <p>Students come back together and analyse the data they found in each state. Create a class graph to show the collection of the data including written interpretations.</p>
<b>Session Resources</b>	<p><b>Student Resources</b></p> <ul style="list-style-type: none"> <li></li> </ul>		<p><b>Teacher Resources</b></p> <ul style="list-style-type: none"> <li>ACS Teacher Resource: Data</li> <li>Technology that contains data about a species of animal, E.g. Frog Census App</li> </ul>	
4.	Making a connection with digital technology and animals	<p><b>Learning Intention</b> Students will complete research into the type of technology that is used to monitor their chosen animal.</p> <p><b>Success Criteria</b> Evaluate the current technology by identifying its strengths and weaknesses</p>	Building on from the third session, discuss the benefits of collecting data and using digital technologies for animals.	Student conduct research to see if a digital system is used to track and monitor their animal. They explain how technology is used to help their animal. They include the type of devices that are used and identify the strengths and weaknesses.
<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> </ul>	

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
5.	Designing a solution	<p><b>Learning Intention</b> Students will design a system that would assist people monitor and help a species of animal.</p> <p><b>Success Criteria</b> I can design a new system based on the research I have completed.</p>	Brainstorm together different type of technology that is current and make a list (wearable technology, mobile devices, voice activation, drones, apps, touch screens). Categorise the list into hardware and software. Discuss with the students how they might use this technology to help with their chosen animal and how students could use the technology to make a current system even better.	<p>Students design a system to help their animal. They make a list of the hardware and software they will use and</p> <p>Prompting questions What technology would you use to help your chosen animal? What would it do? How would it work? Why is that type of technology needed? How does it help your animal?</p>
<b>Session Resources</b>	<b>Student Resources</b>		<b>Teacher Resources</b>	
	<ul style="list-style-type: none"> <li>ACS Student Resource: Peripheral Devices</li> </ul>		<ul style="list-style-type: none"> <li>ACS Teacher Resource: Peripheral Devices</li> </ul>	
6.	Explaining the functions through algorithms	<p><b>Learning Intention</b> Students will explain how the digital system operates using algorithms in the form of explicit English statements and drawings.</p> <p><b>Success Criteria</b> I can explain how my design would operate by using explicit sentences and drawings.</p>	<p>Using a system they have previously investigated, complete the following questions:</p> <p>What does the system do? This is a summary/overview of the system and its goals.</p> <p>How does the system work? This is the explicit instructions/drawings (algorithms)</p>	<p>Students answer both questions used in the modelling session. In the first question they will write a brief description of the system. In the second question, they draw what their system will look like at different stages. Then write a short description of what is happening in each drawing.</p> <p>Students use language of user input to show when a person adds data and branching to show different options to give the user. If they are creating an app they draw all the stages of the app and the different screens.</p>
<b>Session Resources</b>	<b>Student Resources</b>		<b>Teacher Resources</b>	
	<ul style="list-style-type: none"> <li>ACS Student Resource: Algorithms</li> </ul>		<ul style="list-style-type: none"> <li>ACS Teacher Resource: Algorithms</li> </ul>	

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Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
7.	Evaluation	<b>Learning Intention</b> Students will evaluate their design focusing on how it will help the wider community.  <b>Success Criteria</b> I can evaluate my design and explain why my design would help a species.	Answer the same question from the beginning of the unit: Can digital technology help animals?	They evaluate their solution by explain by answering the following questions: How does it help your animal? What technology did you use? What is one feature you like about it? Anything you would add or change?
<b>Session Resources</b>	<b>Student Resources</b> <ul style="list-style-type: none"><li>Evaluation questions and prompts</li></ul>		<b>Teacher Resources</b> <ul style="list-style-type: none"><li>ACS Teacher Resource: Systems to Meet Needs</li></ul>	

# DIGITAL TECHNOLOGY HELPING ANIMALS

Levels 3-4



## 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)	4 & 5	Identifying peripheral devices either in current systems or their design.	Students identified digital systems and peripheral devices that are used to monitor animals.
Recognise different types of data and explore how the same data can be represented in different ways (ACTDIK008)	3	Animal data collection	Students gathered a range of data about animals and used different methods to present the data.
Collect, access and present different types of data using simple software to create information and solve problems (ACTDIP009)	3	Animal data collection	Students gathered data about an animal, presented the data using a simple software and made interpretations about the data.
Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them (ACTDIP010)	6	Explanation of their design	Using their new animal design, students created simple algorithms (instructions) to explain how their new system operated.
Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input (ACTDIP011)	N/A		
Explain how student solutions and existing information systems meet common personal, school or community needs (ACTDIP012)	7	Evaluation of their design	Students evaluated their system design to help an animal, focusing on the positive impact it would have.
Plan, create and communicate ideas and information independently and with others, applying agreed ethical and social protocols (ACTDIP013)	N/A		

# DIGITAL TECHNOLOGY HELPING ANIMALS

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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)	4 & 5	Identifying peripheral devices either in current systems or their design.	Students identified digital systems and peripheral devices that are used to monitor animals.
Recognise different types of data and explore how the same data can be represented in different ways (VCDTDI020)	3	Animal data collection	Students gathered a range of data about animals and used different methods to present the data.
Collect, access and present different types of data using simple software to create information and solve problems (VCDTDI021)	3	Animal data collection	Students gathered data about an animal, presented the data using a simple software and made interpretations about the data.
Individually and with others, plan, create and communicate ideas and information safely, applying agreed ethical and social protocols (VCDTDI022)	N/A		
Define simple problems, and describe and follow a sequence of steps and decisions involving branching and user input (algorithms) needed to solve them (VCDTCD023)	6	Explanation of their design	Using their new animal design, students created simple algorithms (instructions) to explain how their new system operated.
Develop simple solutions as visual programs (VCDTCD024)	N/A		
Explain how student-developed solutions and existing information systems meet common personal, school or community needs (VCDTCD025)	7	Evaluation of their design	Students evaluated their system design to help an animal, focusing on the positive impact it would have.



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## Assessment – New South Wales Science and Technology Syllabus

Outcomes and Objectives	Session Number	Assessment Piece	Stage Statement
Describes how digital systems represent and transmit data (ST2-11DI-T)	4 & 5	Identifying peripheral devices either in current systems or their design.	Students identified digital systems and peripheral devices that are used to monitor animals.
Use a range of methods to represent data, including tables and column graphs	3	Animal data collection	Students gathered a range of data about animals and used different methods to present the data.
Collect, access and present data, using software to present and communicate information and solve problems (ACTDIP009)	3	Animal data collection	Students gathered data about an animal, presented the data using a simple software and made interpretations about the data.
Defines problems, describes and follows algorithms to develop solutions (ST2-3DP-T)	N/A		
Develop a sequence of steps and decisions (algorithms) to solve a problem (ACTDIP010)	6	Explanation of their design	Using their new animal design, students created simple algorithms (instructions) to explain how their new system operated.
Generate visual programs using algorithms to create simple digital solutions	N/A		
Explain how existing information systems meet personal, school or community needs (ACTDIP012)	7	Evaluation of their design	Students evaluated their system design to help an animal, focusing on the positive impact it would have.
Participate individually and collaboratively with clear roles and goals	N/A		
Organise and perform strategic roles within a group to solve a problem	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)	4 & 5	Identifying peripheral devices either in current systems or their design.	Students identified digital systems and peripheral devices that are used to monitor animals.
Different types of data can be represented in different ways (ACTDIK008)	3	Animal data collection	Students gathered a range of data about animals and used different methods to present the data.
Collect and present different types of data using simple software to create useful information (ACTDIP009)	3	Animal data collection	Students gathered data about an animal, presented the data using a simple software and made interpretations about the data.
Use visually represented sequenced steps (algorithms), including steps with decisions made by the user (branching) (ACTDIP011)	N/A		
Create and communicate ideas and information safely (ACTDIP013)	N/A		
Create a sequence of steps to solve a given task (WATPPS16)	6	Explanation of their design	Using their new animal design, students created simple algorithms (instructions) to explain how their new system operated.
Develop and communicate ideas using labelled drawings and appropriate technical terms (WATPPS17)	6	Explanation of their design	Using their new animal design, students created simple algorithms (instructions) to explain how their new system operated.
Select, and safely use, appropriate components with given equipment to make a solution (WATPPS18)	N/A		
Use criteria to evaluate design processes and solutions developed (WATPPS19)	7	Evaluation of their design	Students evaluated their system design to help an animal, focusing on the positive impact it would have.
Work independently, or collaboratively when required, to plan, create and communicate sequenced steps (WATPPS20)	N/A		

# DIGITAL TECHNOLOGY HELPING ANIMALS

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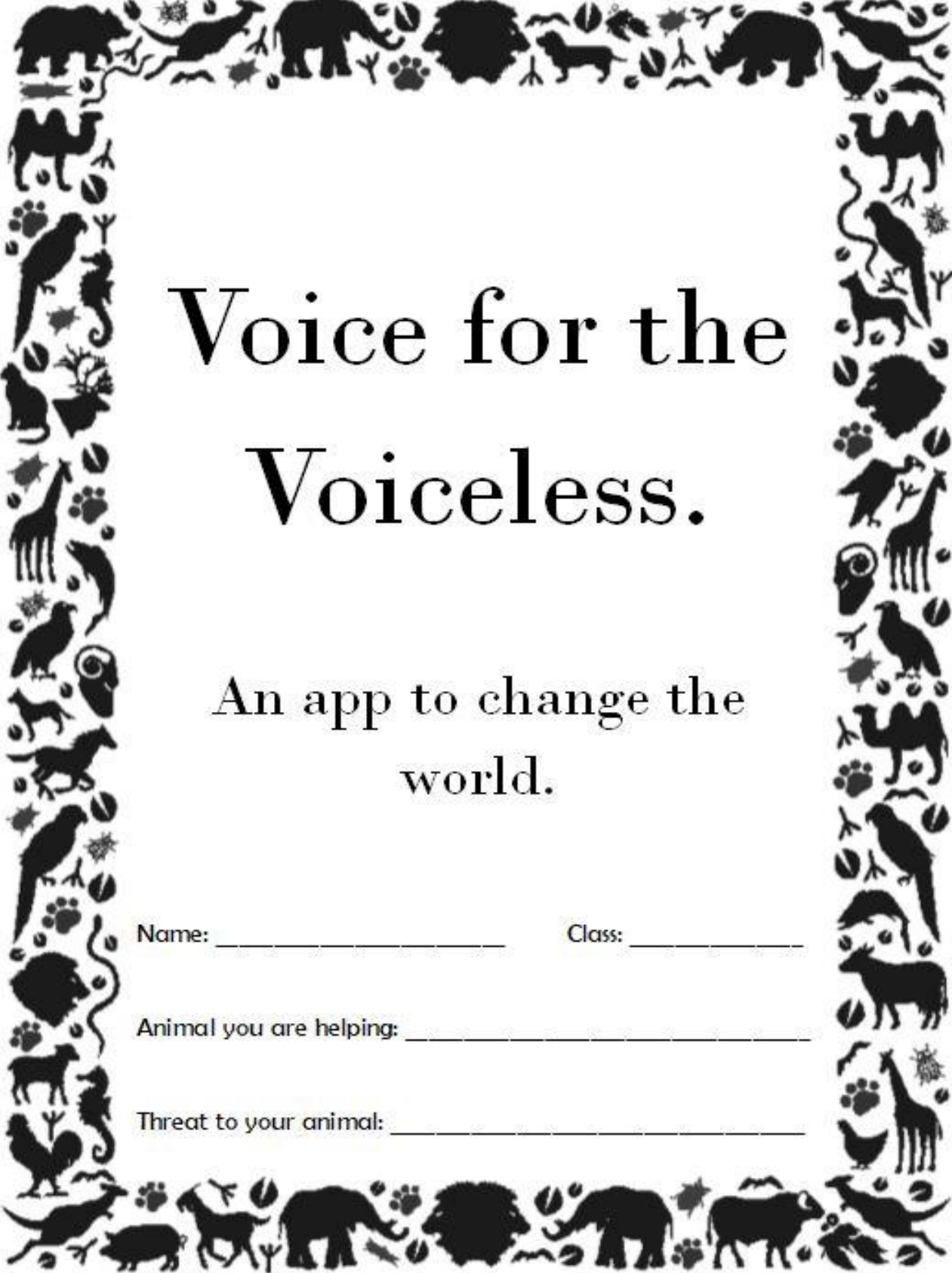


## Assessment – Western Australian Digital Technologies Syllabus

### 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)	4 & 5	Identifying peripheral devices either in current systems or their design.	Students identified digital systems and peripheral devices that are used to monitor animals.
Data can be represented in different ways (ACTDIK008)	3	Animal data collection	Students gathered a range of data about animals and used different methods to present the data.
Collect and present different types of data for a specific purpose using software (ACTDIP009)	3	Animal data collection	Students gathered data about an animal, presented the data using a simple software and made interpretations about the data.
Use simple visual programming environments that include a sequence of steps (algorithm) involving decisions made by the user (branching) (ACTDIP011)	N/A		
Create and communicate ideas and information safely, using agreed protocols (netiquette) (ACTDIP013)	N/A		
Define a sequence of steps to design a solution for a given task (WATPPS21)	6	Explanation of their design	Using their new animal design, students created simple algorithms (instructions) to explain how their new system operated.
Identify and choose the appropriate resources from a given set (WATPPS22)	N/A		
Develop and communicate design ideas and decisions using annotated drawings and appropriate technical terms (WATPPS23)	6	Explanation of their design	Using their new animal design, students created simple algorithms (instructions) to explain how their new system operated.
Select, and safely use, appropriate components and equipment to make solutions (WATPPS24)	N/A		
Use criteria to evaluate and justify simple design processes and solutions (WATPPS25)	7	Evaluation of their design	Students evaluated their system design to help an animal, focusing on the positive impact it would have.
Work independently, or collaboratively when required, to plan, create and communicate ideas and information for solutions (WATPPS26)	N/A		

The following resource booklet was created by the teachers at  
St Francis of Assisi Primary School, Mill Park Victoria



# Voice for the Voiceless.

An app to change the  
world.

Name: \_\_\_\_\_ Class: \_\_\_\_\_

Animal you are helping: \_\_\_\_\_

Threat to your animal: \_\_\_\_\_



## Digital Apps We Know...

Hardware	Software



Which of these technologies would help your animal?

How could you use technology to make a system even better?



Design a system to help your animal including the Hardware and Software you will use.





### Prompting Questions

- What technology would you use to help your chosen animal?
- What would it do?
- How would it work?





Create your own flowchart for your chosen system to help your animal.

Flowchart template 1: A dashed rectangular box containing three horizontal lines for writing.



Flowchart template 2: A dashed rectangular box containing three horizontal lines for writing.



Flowchart template 3: A dashed rectangular box containing three horizontal lines for writing.





Four horizontal lines for writing, enclosed in a dashed rectangular border.



Four horizontal lines for writing, enclosed in a dashed rectangular border.



Four horizontal lines for writing, enclosed in a dashed rectangular border.

### Prompting Questions

- User input.
- Branching (choices)
- Algorithms.
- Description of what is happening at each stage.



## Reflection of your design solution

1) How does it help your animal?

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2) What hardware and software components did you use?

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3) What is one feature you like about it? Why?

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4) Anything you'd love to add? Why?

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5) Why would technology like this be helpful?

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