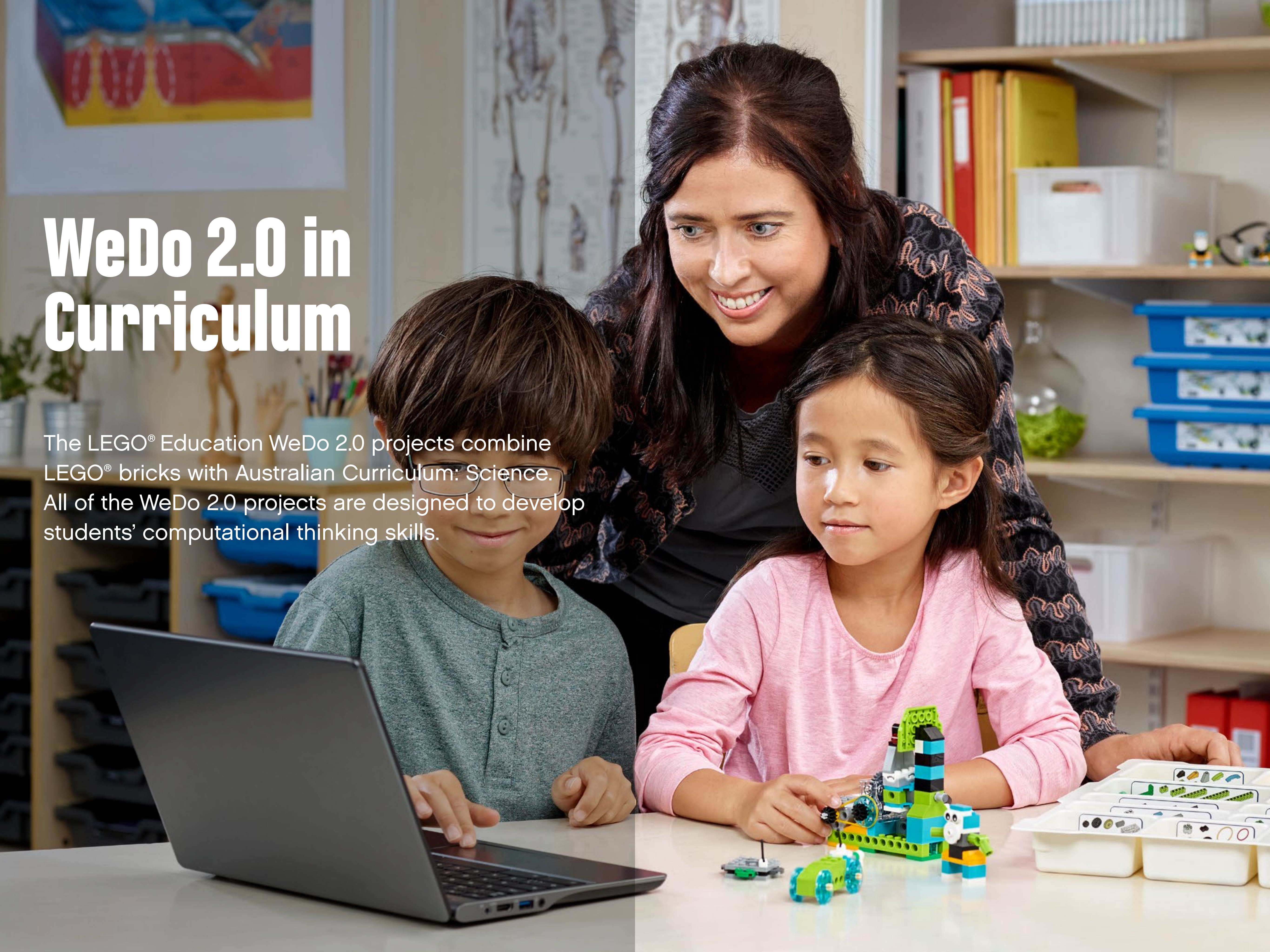


WeDo 2.0 in Curriculum

The LEGO® Education WeDo 2.0 projects combine LEGO® bricks with Australian Curriculum: Science. All of the WeDo 2.0 projects are designed to develop students' computational thinking skills.





Computational Thinking in curriculum

The world is changing, and whether we realise it or not, technology and computer science shape nearly every aspect of our lives. Students are rapidly becoming active citizens, and equipping them with the right set of skills has become one of the nation's first priorities.

Computational thinking is a set of skills that is spreading worldwide, becoming a key practice to develop in relation to technology. Already identified by the Australian Curriculum as a practice essential to the Australian Curriculum: Digital Technologies. Computational thinking has found roots in many other national curriculums around the world with an emphasis on the development of computational thinking skills.

These important skills can be developed through engaging activities or projects that are rooted in real life problem-based situations. To support this development, LEGO® Education is adding a dedicated series of computational thinking projects to the science projects that are already available in WeDo 2.0.



Visual overview of Guided Projects

1. Moon Base

This project is about designing a solution in which a robot would be able to assemble a base on the moon.

2. Grabbing Objects

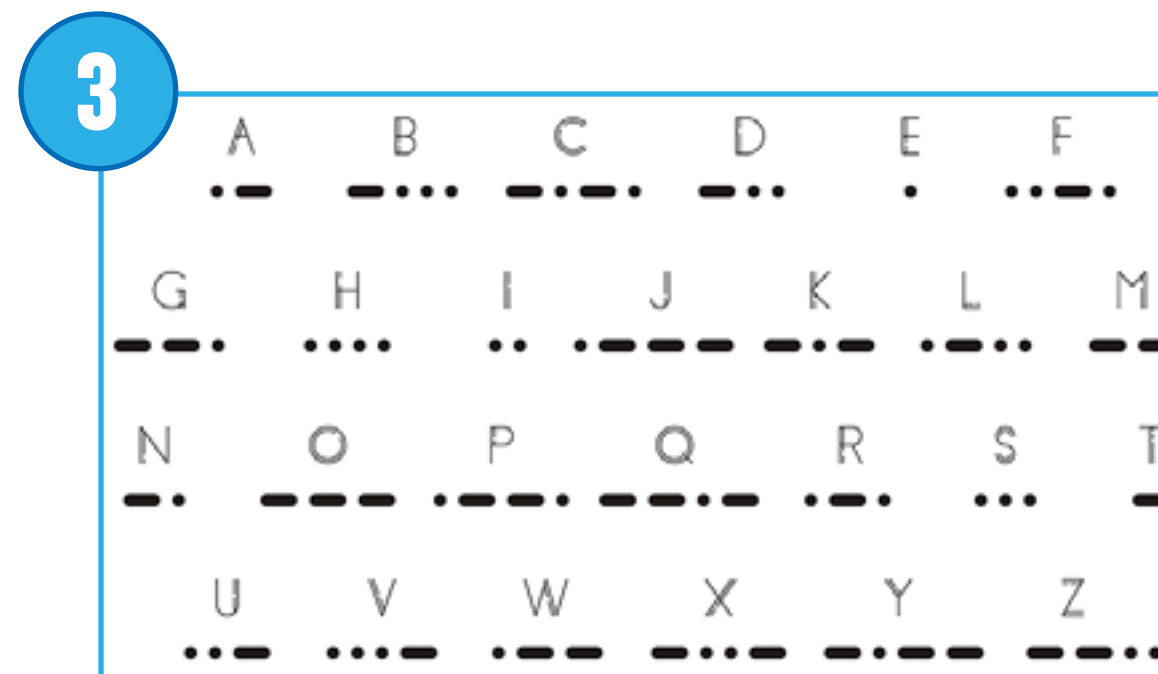
This project is about designing a solution for a prosthetic arm that is able to move small objects around.

3. Send Messages

This project is about designing a solution for exchanging information using a system of signals organised in patterns.

4. Volcano Alert

This project is about designing a device for improving the monitoring of volcanic activity in order to guide scientific exploration.





Visual overview of Open Projects

5. Inspection

This project is about designing a solution in which a robot is able to inspect narrow spaces, guiding its motion with sensors.

6. Emotional Design

This project is about designing a solution in which a robot can display positive emotions when interacting with people.

7. City Safety

This project is about designing a solution to improve safety in a city.

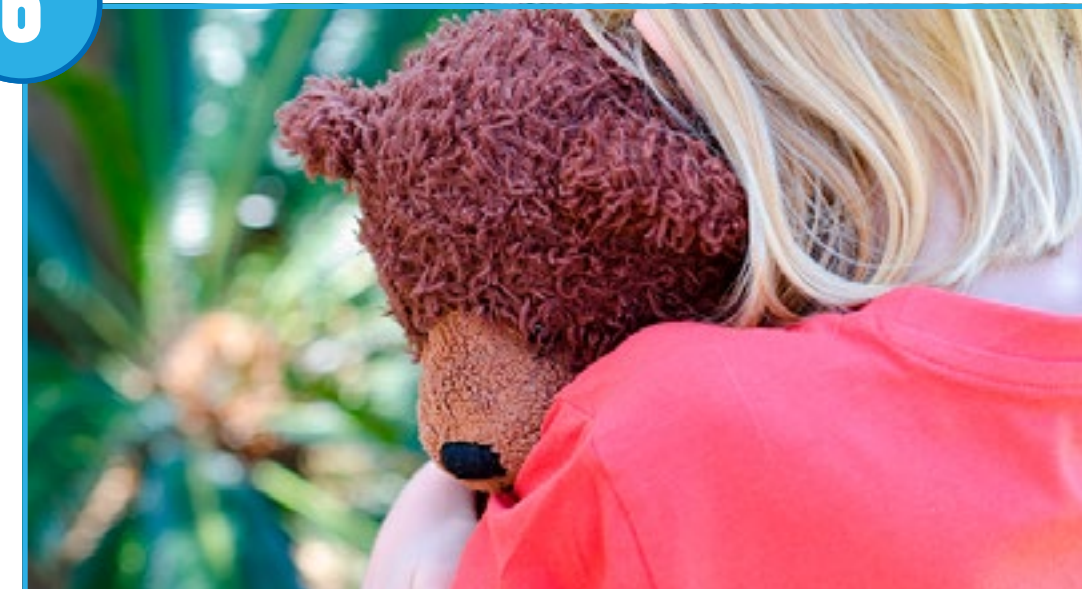
8. Animal Senses

This project is about modelling how animals use their senses to interact with their environment.

5



6



7



8





Potential Flow to develop Computational Thinking skills

You can organise the projects as you wish. Each project highlights opportunities for developing computational thinking skills, and it is up to you to focus on the ones that are most relevant to you and your students. Here is one suggested sequence, which is based on an increasing level of complexity in the programming concepts covered:

Getting Started

Use two lessons of 45 minutes each to introduce your students to WeDo 2.0.

Lesson 1, Milo, the Science Rover

Lesson 2, combine Milo's Motion Sensor, Milo's Tilt Sensor, and Collaborating

Guided Projects

Use two lessons of 45 minutes each, during which students will program a sequence of actions.

Lesson 3, Moon Base (Explore and Create phase)

Lesson 4, Moon Base (Test and Share phase)

Use two lessons of 45 minutes each, during which students will use sensors (inputs).

Lesson 5, Grabbing Objects (Explore and Create phase)

Lesson 6, Grabbing Objects (Test and Share phase)

Use two lessons of 45 minutes each, during which students will use sensors (inputs), loops, and parallel programming.

Lesson 7, Send Messages (Explore and Create phase)

Lesson 8, Send Messages (Test and Share phase)

Use two lessons of 45 minutes each to introduce your students to conditions, and how to integrate all of the other programming principles.

Lesson 9, Volcano Alert (Explore and Create phase)

Lesson 10, Volcano Alert (Test and Share phase)

Open Projects

Use two or three lessons of 45 minutes each to make your own project based on one of the suggested Open Projects. This project should integrate all of the programming principles, as well as the computational thinking skills developed during the Guided Projects.



Potential Flow to develop Computational Thinking skills

Getting Started

Introduce your students to WeDo 2.0



45 minutes

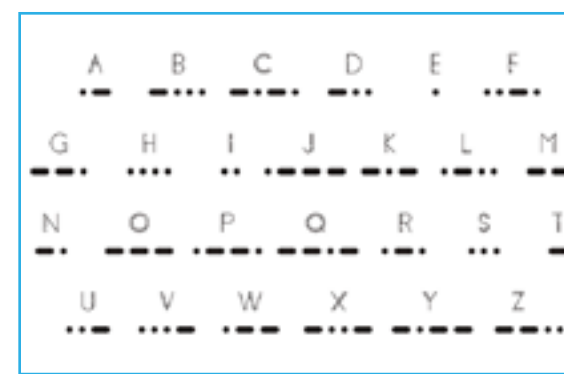


45 minutes



Guided Project - Send Messages

Students will use sensors (inputs), loops, and parallel programming.



Using a condensed lesson flow
2 x 45 minutes



Guided Project - Moon Base

Students will program sequences of actions.



Using a condensed lesson flow
2 x 45 minutes



Guided Project - Volcano Alert

Students will be introduced to conditions, and to other programming principles.



Using a condensed lesson flow
2 x 45 minutes



Guided Project - Grabbing Objects

Students will use sensors (inputs).



Using a condensed lesson flow
2 x 45 minutes



Open Projects





Curriculum Overview of Guided Projects organised by Australian Curriculum: Science Content Descriptors

Guided Projects											
	Science Inquiry Skills					Science Understanding				Science as a Human Endeavour	
	■ Year 2 ■ Year 3 ■ Year 4 ■ Year 5 ■ Year 6										
Project	Questioning and predicting	Planning and conducting	Processing and analysing data and information	Evaluating	Communicating	Biological sciences	Chemical sciences	Earth and space sciences	Physical sciences	Nature and development of science	Use & influence of science
1. Moon Base		■ ACSIS038 ■ ACSIS054 ■ ACSIS065 ■ ACSIS086 ■ ACSIS103			■ ACSIS042 ■ ACSIS060 ■ ACSIS071 ■ ACSIS093 ■ ACSIS110					■ ACSHE050 ■ ACSHE061 ■ ACSHE081 ■ ACSHE098	
2. Grabbing Objects		■ ACSIS054 ■ ACSIS065 ■ ACSIS086 ■ ACSIS103			■ ACSIS060 ■ ACSIS071 ■ ACSIS093 ■ ACSIS110						
3. Send Messages		■ ACSIS038 ■ ACSIS054 ■ ACSIS065 ■ ACSIS086 ■ ACSIS103			■ ACSIS042 ■ ACSIS060 ■ ACSIS071 ■ ACSIS093 ■ ACSIS110						
4. Volcano Alert		■ ACSIS038 ■ ACSIS054 ■ ACSIS065 ■ ACSIS086 ■ ACSIS103			■ ACSIS042 ■ ACSIS060 ■ ACSIS071 ■ ACSIS093 ■ ACSIS110			■ ACSSU096		■ ACSHE034 ■ ACSHE050 ■ ACSHE061 ■ ACSHE081 ■ ACSHE098	■ ACSHE100



Curriculum Overview of Open Projects organised by Australian Curriculum: Science Content Descriptors

Open Projects											
	Science Inquiry Skills					Science Understanding				Science as a Human Endeavour	
	■ Year 2 ■ Year 3 ■ Year 4 ■ Year 5 ■ Year 6										
Project	Questioning and predicting	Planning and conducting	Processing and analysing data and information	Evaluating	Communicating	Biological sciences	Chemical sciences	Earth and space sciences	Physical sciences	Nature and development of science	Use & influence of science
5. Inspection		■ ACSIS038 ■ ACSIS054 ■ ACSIS065 ■ ACSIS086 ■ ACSIS103			■ ACSIS042 ■ ACSIS060 ■ ACSIS071 ■ ACSIS093 ■ ACSIS110						
6. Emotional Design		■ ACSIS038 ■ ACSIS054 ■ ACSIS065 ■ ACSIS086 ■ ACSIS103			■ ACSIS042 ■ ACSIS060 ■ ACSIS071 ■ ACSIS093 ■ ACSIS110						
7. City Safety		■ ACSIS038 ■ ACSIS054 ■ ACSIS065 ■ ACSIS086 ■ ACSIS103			■ ACSIS042 ■ ACSIS060 ■ ACSIS071 ■ ACSIS093 ■ ACSIS110						
8. Animal Senses		■ ACSIS038 ■ ACSIS054 ■ ACSIS065 ■ ACSIS086 ■ ACSIS103			■ ACSIS042 ■ ACSIS060 ■ ACSIS071 ■ ACSIS093 ■ ACSIS110	■ ACSSU043					



Australian Curriculum: Science Content Descriptors

Year 2

Science Inquiry Skills

Planning and conducting

- **ACSIS038** Participate in guided investigations to explore and answer questions

Communicating

- **ACSIS042** Represent and communicate observations and ideas in a variety of ways

Science as a Human Endeavour

Nature and development of science

- **ACSHE034** Science involves asking questions about, and describing changes in, objects and events

Year 3

Science Inquiry Skills

Planning and conducting

- **ACSIS054** With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment

Communicating

- **ACSIS060** Represent and communicate observations, ideas and findings using formal and informal representations

Science as a Human Endeavour

Nature and development of science

- **ACSHE050** Science involves making predictions and describing patterns and relationships

Year 4

Science Inquiry Skills

Planning and conducting

- **ACSIS065** With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment

Communicating

- **ACSIS071** Represent and communicate observations, ideas and findings using formal and informal representations

Science as a Human Endeavour

Nature and development of science

- **ACSHE061** Science involves making predictions and describing patterns and relationships

Year 5

Biological sciences

- **ACSSU043** Living things have structural features and adaptations that help them to survive in their environment

Science Inquiry Skills

Planning and conducting

- **ACSIS086**

Communicating

- **ACSIS093**

Science as a Human Endeavour

Nature and development of science

- **ACSHE081** Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions

Year 6

Science Inquiry Skills

Earth and space sciences

- **ACSSU096** Sudden geological changes or extreme weather conditions can affect Earth's surface

Planning and conducting

- **ACSIS103**

Communicating

- **ACSIS110**

Science as a Human Endeavour

Nature and development of science

- **ACSHE098** Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions

Use & influence of science

- **ACSHE100** Scientific knowledge is used to solve problems and inform personal and community decisions



Overview of Guided Projects organised by Science and Engineering Practices

	1 Moon Base	2 Grabbing Objects	3 Send Messages	4 Volcano Alert
Practice One: Ask questions and define problems	●	●	●	●
Practice Two: Develop and use models				
Practice Three: Plan and carry out investigations				
Practice Four: Analyse and interpret data				
Practice Five: Use mathematics and computational thinking	●	●	●	●
Practice Six: Construct explanations and design solutions	●	●	●	●
Practice Seven: Engage in argument from evidence	●	●	●	●
Practice Eight: Obtain, evaluate, and communicate information	●	●	●	●



Overview of Open Projects organised by Science and Engineering Practices

	5 Inspection	6 Emotional Design	7 City Safety	8 Animal Senses
Practice One: Ask questions and define problems	●	●	●	●
Practice Two: Develop and use models				●
Practice Three: Plan and carry out investigations				
Practice Four: Analyse and interpret data				
Practice Five: Use mathematics and computational thinking	●	●	●	●
Practice Six: Construct explanations and design solutions	●	●	●	
Practice Seven: Engage in argument from evidence	●	●	●	●
Practice Eight: Obtain, evaluate, and communicate information	●	●	●	●



Curriculum Overview of Projects organised by Australian Curriculum: Digital Technologies Content Descriptors

	Knowledge and Understanding				Process and Production Skills			
	Digital Systems	Representation of data	Collecting, managing and analysing data	Investigating and defining	Generating and designing	Producing and implementing	Evaluating	Collaborating and managing
	■ Year F-2 ■ Year 3-4 ■ Year 5-6							
1. Moon Base	■ ACTDIK001 ■ ACTDIK007 ■ ACTDIK014			■ ACTDIP004 ■ ACTDIP010 ■ ACTDIP017	■ ACTDIP019	■ ACTDIP011 ■ ACTDIP020		
2. Grabbing Objects	■ ACTDIK001 ■ ACTDIK007 ■ ACTDIK014			■ ACTDIP004 ■ ACTDIP010 ■ ACTDIP017	■ ACTDIP019	■ ACTDIP011 ■ ACTDIP020		
3. Send Messages	■ ACTDIK001 ■ ACTDIK007 ■ ACTDIK014	■ ACTDIK008 ■ ACTDIK015		■ ACTDIP004 ■ ACTDIP010 ■ ACTDIP017	■ ACTDIP019	■ ACTDIP011 ■ ACTDIP020		
4. Volcano Alert	■ ACTDIK001 ■ ACTDIK007 ■ ACTDIK014	■ ACTDIK008		■ ACTDIP004 ■ ACTDIP010 ■ ACTDIP017	■ ACTDIP019	■ ACTDIP011 ■ ACTDIP020		
5. Inspection	■ ACTDIK001 ■ ACTDIK007 ■ ACTDIK014			■ ACTDIP004 ■ ACTDIP010 ■ ACTDIP017	■ ACTDIP019	■ ACTDIP011 ■ ACTDIP020		
6. Emotional Design	■ ACTDIK001 ■ ACTDIK007 ■ ACTDIK014			■ ACTDIP004 ■ ACTDIP010 ■ ACTDIP017	■ ACTDIP019	■ ACTDIP011 ■ ACTDIP020		
7. City Safety	■ ACTDIK001 ■ ACTDIK007 ■ ACTDIK014			■ ACTDIP004 ■ ACTDIP010 ■ ACTDIP017	■ ACTDIP019	■ ACTDIP011 ■ ACTDIP020		
8. Animal Senses	■ ACTDIK001 ■ ACTDIK007 ■ ACTDIK014			■ ACTDIP004 ■ ACTDIP010 ■ ACTDIP017	■ ACTDIP019	■ ACTDIP011 ■ ACTDIP020		



Australian Curriculum: Digital Technologies Content Descriptors

Year F-2

Knowledge and Understanding

Digital Systems

ACTDIK001 Recognise and explore digital systems (hardware and software components) for a purpose

Process and Production Skills

Investigating and defining

ACTDIP004 Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems

Year 3-4

Knowledge and Understanding

Digital Systems

ACTDIK007 Identify and explore a range of digital systems with peripheral devices for different purposes, and transmit different types of data

Representation of data

ACTDIK008 Recognise different types of data and explore how the same data can be represented in different ways

Process and Production Skills

Investigating and defining

ACTDIP010 Define simple problems, and describe and follow a sequence of steps and decisions (algorithms) needed to solve them

Producing and implementing

ACTDIP011 Implement simple digital solutions as visual programs with algorithms involving branching (decisions) and user input

Year 5-6

Knowledge and Understanding

Digital Systems

ACTDIK014 Examine the main components of common digital systems and how they may connect together to form networks to transmit data

Representation of data

ACTDIK015 Examine how whole numbers are used to represent all data in digital systems

Process and Production Skills

Investigating and defining

ACTDIP017 Define problems in terms of data and functional requirements drawing on previously solved problems

Generating and designing

ACTDIP019 Design, modify and follow simple algorithms involving sequences of steps, branching, and iteration (repetition)

Producing and implementing

ACTDIP020 Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input