

Shell Cove Public School

Science and Technology Scope & Sequence

Stage Two

Science ODD Year – Term 1 and 2			Stage 2	
	Outcomes + Thinking Skills	Inquiry Questions	Content	Assessment
1	<ul style="list-style-type: none"> - ST2-5LW-T - Describes how agricultural processes are used to grow plants and raise animals for food, clothing, shelter <p>Working Scientifically</p> <ul style="list-style-type: none"> - ST2-1WS-S - Questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations <ul style="list-style-type: none"> • Processing and Analysing data • Communicating - Scientific Thinking – SciT - Systems Thinking- SysT - Design Thinking – DesT 	<ul style="list-style-type: none"> - How do we create food and fibre products from animals and plants? 	<p>Living World Unit: Investigating Food and Fibre (Focus - Pig/Cow/Sheep/Corn)</p> <ul style="list-style-type: none"> - Investigates and compares advancing technologies used in food and fibre production in Australian agriculture and those used in traditional agriculture. - Investigates food technologies and techniques used to produce healthy food. - Designs, plans and produces a greenhouse to support the growth of a plant and/or animal. 	<ul style="list-style-type: none"> - Week 3 Pre-Test - Week 10 Post-Test <p>Phase/Assessment Focus:</p> <ul style="list-style-type: none"> - Engage- Diagnostic - Explore/ Explain – Formative - Elaborate – Summative of Science Inquiry Skills - Evaluate - Summative of Science Understanding - See specific details in the unit.
2	<ul style="list-style-type: none"> - ST2-10ES-S - Investigates regular changes caused by interactions between the Earth and the Sun, and changes to the Earth’s surface <p>Working Scientifically</p> <ul style="list-style-type: none"> - ST2-1WS-S - Questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations <ul style="list-style-type: none"> • Processing and Analysing data • Communicating - Scientific Thinking – SciT - Systems Thinking- SysT - Design Thinking – DesT 	<ul style="list-style-type: none"> - How do natural processes and human actions change the Earth’s surface over time? 	<p>Earth and Space Unit – No Unit – Unit needs to be written</p> <ul style="list-style-type: none"> - Investigates why the Earth’s surface changes over time as a result of natural processes and human activity. - Identifies evidence of natural changes in landforms, rocks or fossils. 	<ul style="list-style-type: none"> - Week 1 Pre-Test - Week 5 Post-Test (Reports) - Week 10 <p>Phase/Assessment Focus:</p> <ul style="list-style-type: none"> - Engage- Diagnostic - Explore/ Explain – Formative - Elaborate – Summative of Science Inquiry Skills - Evaluate - Summative of Science Understanding - See specific details in the unit.

Working Scientifically

Term 1 and Term 2

- Makes predictions based on prior knowledge and plan scientific investigations with guidance.
- Considers and applies the elements of fair tests.
- Collects and records accurate, honest observations.
- Uses labelled observational drawings, basic formal measurements and digital technologies as appropriate.

All	ST2-2DP-T ST2-3DP-T ST2-11DI-T	Digital Technologies Design and Production and Technology Skills and Understanding	See Technology Scope and Sequence
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Science ODD Year – Term 3 and 4		Stage 2		
	Outcomes + Thinking Skills	Inquiry Questions	Unit + Content	Assessment
3	<ul style="list-style-type: none"> - ST2-6MW-S - Describes how adding or removing heat causes a change of state. <p>Working Scientifically</p> <ul style="list-style-type: none"> - ST2-1WS-S - Questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations. • Questioning and Predicting • Planning and Conduct Investigations <ul style="list-style-type: none"> - Computational Thinking – ComT - Scientific Thinking- SciT - Systems Thinking – SysT 	<ul style="list-style-type: none"> - How do materials change when heated and cooled? 	<p>Material World Primary Connections Unit – Melting Moments</p> <ul style="list-style-type: none"> - Identifies solids, liquids and gases as states of matter. - Describes examples of changes of state in everyday life. - Predicts and observes the effects of adding or removing heat on a variety of solids and/or liquids. 	<ul style="list-style-type: none"> - Week 1 Pre-Test - Week 10 <p>Phase/Assessment Focus:</p> <ul style="list-style-type: none"> - Engage- Diagnostic - Explore/ Explain – Formative - Elaborate – Summative of Science Inquiry Skills - Evaluate - Summative of Science Understanding - See specific details in the unit.
4	<ul style="list-style-type: none"> - ST2-8PW-ST - Describes the characteristics and effects of common forms of energy, such as light and heat <p>Working Scientifically</p> <ul style="list-style-type: none"> - ST2-1WS-S - Questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations. • Planning and Conducting Investigations • Processing and Analysing data <ul style="list-style-type: none"> - Scientific Thinking- SciT 	<ul style="list-style-type: none"> - How do heat, light and electrical energy make things happen? 	<p>Physical World Primary Connections Unit – Heating Up</p> <ul style="list-style-type: none"> - Investigates how light reflects in a mirror and on a variety of different surfaces. - Investigates how shadows are formed. - Explores some common sources and uses of electrical energy. - Describes different ways electrical energy can be generated sustainably, e.g. solar cells, hydroelectric power, wind turbines, geothermal power generation, wave power. 	<ul style="list-style-type: none"> - Week 1 Pre-Test - Week 5 Post-Test (Reports) <p>Phase/Assessment Focus:</p> <ul style="list-style-type: none"> - Engage- Diagnostic - Explore/ Explain – Formative - Elaborate – Summative of Science Inquiry Skills - Evaluate - Summative of Science Understanding - See specific details in the unit.

Working Scientifically

	<p>Term 3 and Term 4</p> <ul style="list-style-type: none"> - Uses a range of methods to represent data, including tables and column graphs. - Compares results with predictions. - Suggests possible reasons for findings. - Represents and communicates observations, ideas and findings, using formal and informal representations. 		
All	<p>ST2-2DP-T</p> <p>ST2-3DP-T</p> <p>ST2-11DI-T</p>	<p>Digital Technologies</p> <p>Design and Production and</p> <p>Technology Skills and Understanding</p>	<p>See Technology Scope and Sequence</p>

Technology + STEM ODD Year			Stage 2	
	Outcomes + Thinking Skills	Inquiry Questions + Links	Unit + Content	Assessment
1	<p>Digital Technologies</p> <ul style="list-style-type: none"> - ST2-11DI-T – Describes how digital systems represent and transmit data - Scientific Thinking – SciT - Design Thinking – DesT - Systems Thinking – Sys-T 	<ul style="list-style-type: none"> - How do digital systems share information and instructions? - Authentic Link to Living World – Droughts 2019 	<p>Unit – Peripheral Devices and Applying Protocol</p> <ul style="list-style-type: none"> - Identifies and explores a range of digital systems. - Explores how digital systems transmit different types of data. 	<ul style="list-style-type: none"> - Week 3: Pre-test - Week 10: Post-test <p>Ongoing</p> <ul style="list-style-type: none"> - Photos or work samples - Evidence of learning against goals - Diagnostic checklist – ICT Skills) <p>Links to outside agencies</p> <ul style="list-style-type: none"> - UOW Education Students - Young Einstein Day Whole School Event
2	<p>Design and Production 1</p> <ul style="list-style-type: none"> - ST2-3DP-T - Defines problems, describes and follows algorithms to develop solutions - Scientific Thinking – SciT - Design Thinking – DesT - Systems Thinking – Sys-T - Computational Thinking – Com-T 	<ul style="list-style-type: none"> - How are algorithms used to develop digital systems? - Authentic Link to Earth and Space – Changes in the sky and on land 	<p>Unit – Programming Project – Comet Eclipse</p> <ul style="list-style-type: none"> - Uses a series of sequenced images, written instructions and/or flowcharts to present food production instructions. - Creates and follows algorithms using branching. 	<ul style="list-style-type: none"> - Week 1 Pre-test - Week 5 Mid-test (Reports) - Week 10 Post-test <p>Ongoing</p> <ul style="list-style-type: none"> - Photos or worksamples - Evidence of learning against goals - Diagnostic checklist – ICT Skills) <p>Links to outside agencies</p> <ul style="list-style-type: none"> - STEM Share – Augmented Reality Space Kit

<p>3</p>	<p>Design and Production 2</p> <ul style="list-style-type: none"> - ST2-2DP-T - Selects and uses materials, tools and equipment to develop solutions for a need or opportunity - Scientific Thinking – SciT - Design Thinking – DesT 	<ul style="list-style-type: none"> - How can we help to solve real world problems? - Authentic link to Material World – School Playground 	<p>Unit – To be written</p> <ul style="list-style-type: none"> - Investigates and researches materials, components, tools and techniques to produce design solutions. - Defines simple problems by determining and defining a process. - Develops a sequence of steps and decisions to solve a problem. - Generates visual programs using algorithms to create simple digital solutions. 	<ul style="list-style-type: none"> - Week 1 Pre-test - Week 10 Post-test <p>Phase/Assessment Focus:</p> <ul style="list-style-type: none"> - Engage- Diagnostic - Explore/ Explain – Formative - Elaborate – Summative of Science Inquiry Skills - Evaluate - Summative of Science Understanding - See specific details in the unit. <p>Links to outside agencies/competitions</p> <ul style="list-style-type: none"> - Film Making competition Illawarra Schools - Aeroplane Jelly Competition - Sculptures @ Killalea -
<p>4</p>	<p>Digital Technologies</p> <ul style="list-style-type: none"> - ST2-11DI-T – Describes how digital systems represent and transmit data - Scientific Thinking – SciT - Design Thinking – DesT - Systems Thinking – Sys-T 	<ul style="list-style-type: none"> - Why do we represent data in different ways? - Authentic Link to Physical World –How to assist the deaf using sound, electricity etc. 	<p>Unit – Input and Output in a Secret Code</p> <ul style="list-style-type: none"> - Recognises that numbers, text, images, sounds, animations and videos are all forms of data when stored or viewed using a digital system. - Investigates how the same data can be represented in different ways, e.g. codes and symbols. 	<ul style="list-style-type: none"> - Week 1 Pre-test - Week 5 Mid-test (Reports) <p>Phase/Assessment Focus:</p> <ul style="list-style-type: none"> - Engage- Diagnostic - Explore/ Explain – Formative - Elaborate – Summative of Science Inquiry Skills - Evaluate - Summative of Science Understanding - See specific details in the unit. <p>Links to outside agencies/competitions</p> <ul style="list-style-type: none"> - UOW Science Fair - Film Making

Stage Two Learning Continuum

Managing/Operating	Stage 2	
Identify technology equipment	3	4
Keyboard & Mouse		
Monitor		
Printer		
Hard Drive		
Data Projector/IWB		
Laptop		
Digital Camera		
iPad		
Internal Components (RAM/CPU etc)	r	r
Care & use of technology equipment	3	4
Move mouse		
Click & double click mouse		
Identify letters on the keyboard		
Select & move objects		
Use special keys - enter/space bar		
Manage files – name/save/open/delete	r	r
Turn computer on/off		
Correct posture		
Access & exit software/apps		
Print files		
Select a printer		
Understand terms	3	4
Cursor		
Software/Hardware		
Internet		
Menu		
Open/Close program or app		
Login & Password		
Tool bar/scroll bar		
Cell, Row, Column	r	r
Save/save as		
Database	i	r
Spreadsheet	i	r
Software Skills	3	4
Locate software/app		
Select/Open/Close		

Investigating	Stage 2	
Investigating Web 2.0 tools	3	4
Locate/use suitable web 2.0 tools	i	r
Creating & Publishing to blog/Gsuite/O365	3	4
Understands (ethical) responsibilities when publishing on line	r	r
Contributes to blog/seesaw	i	r
Familiar with interface	i	r
Can edit/save text	i	r
Can upload file/image	i	r
Can create a hyperlink	i	r
Can embed object/widget	i	r

Ethics/Cybersafety	Stage 2	
Responsible use of information	3	4
Acknowledging that words & pictures belong to another person	i	r
Understand authors own their work	i	r
Understand you cannot use their work as your own	i	r
Acknowledging anyone whose work you have used in creating your own	i	r
Understand the meaning of copyright	i	r
Understand there are copyright laws to protect ownership of material	i	r
Giving credit to an information source by citing sources		i

Investigating	Stage 2	
Using the internet	3	4
Open browser		
Find a specific location		
Use "back, forward, home, close & refresh."		
Completes a search using key words		
Explores features of web page hyperlink		
Broaden/narrow search	i	r
Uses a bookmark or favourite	i	r
Uses history	i	r
Understands parts of a url	i	r
Evaluate information useful/credible/accurate	i	r
Cites sources in a bibliography		i
Using the school domain	3	4
Log in to computer		
Find a specific programme		
Open; close; minimise; maximise		
Changes Portal password		
Uses Portal for simple email		
Using email	3	4
Open portal		
Open mail program		
Compose & send an email (with help)		
Read an email		
Reply to an email	r	
Forward an email	i	r
Print an email	i	r
Add an attachment	i	r
Know email address	i	r
Use address book	i	r
Delete emails	i	r
Empty trash	i	r

Ethics/Cybersafety	Stage 2	
Shows appropriate ethical conduct	3	4
Follows school computer policy		
Use "safe" habits when using technology to ensure personal safety and security of private information		
Discuss & establish "safe" habits when using technology to ensure personal safety and security of private information	r	r
Uses computer based technologies appropriately	r	
Uses computer netiquette	r	r
Awareness of copyright laws & obligations	r	r
Well being	3	4
Correct posture	r	r
Holding mouse		
Careful use of equipment		
Eye distance from screen,		
Taking a break		
Examines the use of computers in society	3	4
Can identify where computers are being used		
Can identify how computers affect their way of life		
Examines privacy & safety	3	4
Keeping passwords safe	r	
Use of computers/internet	i	r
Privacy & safety concerns	i	r
Avatars & aliases	i	r
Social network sites		i

Communicating – Word Processing	Stage 2	
Manipulate documents	3	4
Use drop down menus		
Open/Close file		
Save file - with help		
Name file - with help		
Use "save" and "save as"		
Select page orientation		
Change line spacing	r	
Add a page border	r	
Indent text/use tab	r	
Use a header/footer/page number	i	r
Change margins	i	r
Use templates	i	r
Enter & modify text	3	4
Enter text		
Select - highlight text		
Delete text (letters, words)		
Modify text - colour; size; font		
Copy text		
Paste text		
Select text		
Change font style e.g. bold		
Change font size		
Change font		
Change text justification		
Use Undo and Redo		
Use columns & tables		
Use spell checker	r	
Use short cuts to edit text	i	r
Use grammar checker	i	r
Use thesaurus	i	r
Use bullets & numbering	i	r
Use find and replace		i

Communicating – Word Processing	Stage 2	
Print documents	3	4
Print completed documents (with help)		
Use print preview		
Print selected parts	i	r
Add graphics	3	4
Insert pictures		
Manipulate pictures - size; position; order		
Insert online pictures		
Insert & manipulate Word Art		
Insert & manipulate Shapes		

Communicating – Typing Skills	Stage 2	
Typing	3	4
Sit straight in chair		
Keep feet flat on the floor		
Have body one outstretched hand width from keyboard		
Have wrists in straight position		
Identify the home row		
Place hands on the home row		
Locate new key on the keyboard		
Make correct reach to new key		
Type the new key in simple words		
Use correct fingering for alphabet keys		
Use quick gentle stroke for keys		
Keep eyes on the copy		
Key in simple paragraphs		
Use punctuation keys		

Creating -Multimedia (using software/iPad/ Wacom/online programs)	Stage 2	
Use Peripherals	3	4
Use an iPad		
Use a Wacom tablet		
Use digital camera (still/movie)		
Use a microphone		
Use a digital camera	3	4
Learns basic functions	r	
Uses to create digital image	r	
Uploads image to computer	r	
Use a Wacom tablet	3	4
Parts of the Wacom		
usb plug & plugging into computer		
Operating the Wacom		
Removal & storage of Wacom		

Creating -Robotics	Stage 2	
Describe different sorts of robots	3	4
Real & fictional		
Discuss some uses for robots & robotic technology in our society		
Research famous robots	i	
Program a Robot	3	4
Become familiar with program interface		
Program robotic to move; fwd/bwd/left/ right		
Program robot to complete a set of challenges		
Test & modify program		
* BeeBot		
* Code-A-Pillar		
* Ozobots		
Build & Programme a Robot	3	4
Construct a robot		
Familiarity with the programme/interface		
Program robot to follow a series of instructions		
Test & modify program		
* Edisons	3	4
* Lego Boost	3	4
* Microbit	3	4
Build a Robot	3	4
Use materials provided to build a robot		
Test robot		
Modify build		
Observe & discuss function		
*ArtBots		
*BrushBots		
*WiggleBot		
Unplugged Robotics	3	4
Create symbols	r	
Program "robot" to follow your instructions	r	
Test & modify programme	r	

Creating -Multimedia (using software/iPad/ Wacom/online programs)	Stage 2	
Use a paint/draw program	3	4
Identify tool bar		
Use tools e.g. fill, brush, pencil		
Use colour palette		
Delete an object		
Print a drawing		
Resize an object		
Rotate an object		
Save a picture as a file		
Insert drawing into a document		
Create a slide show	3	4
Insert a slide		
Design layout		
Add shapes		
Import picture		
Add animation		
Show slide show		
Format design layout	r	
Add a sound	r	
Add a variety of transitions	r	
Print slide show	r	
Add a video clip (if required)	r	
Use and edit preset themes	r	
Insert hyperlinks	r	
Save show as wmv	r	

i – introduced ■ r – reinforced ■ used independently ■ Continue development ■

Creating -Animations	Stage 2	
Introduce simple animation – Power Point	3	4
Use Power Point to animate an item		
Create slide		
Insert shapes	r	
Group shapes	r	
Import images	r	
Manipulate images	r	
Create a background		
Import background	r	
Insert clip art		
Ordering objects and perspective	r	
Adding duplicate slides	r	
Moving objects consistent distance	r	
Use animation tools	r	
Apply transitions	r	
Use loops & timing	r	
Save as ppt/pptx/wmv	r	
Animation - Dolnk	3	4
Become familiar with interface		
Draw images		
Import images	r	
Animate images using onion skin technique (1)	i	r
Save in gallery		
Create background	r	
Create a composition	r	
Animate images using key frames (2)	i	r
Save/export		
Rendering as a movie	i	r

Creating -Animations	Stage 2	
Animation - Pivot	3	4
Investigate interface		
Investigate creating backgrounds	i	r
Manipulate figures		
Create figures/objects		
Create movement – using onion skin technique		
Manage speed	i	r
Saving as .piv		
Saving as .gif	i	r
Rendering as a movie	i	r
Animation – online programs	3	4
Creates an animation using picasion	i	r
Creates an animation using abcya		

Communicating - Spreadsheets	Stage 2	
Using a spreadsheet	3	4
Understand uses of spreadsheet	i	r
Understand such terms as cell, column...	i	r
Gather information	i	r
Creating a spreadsheet	3	4
Enter & edit data in cells	i	r
Identify a cell	i	r
Identify the formula bar	i	r
Change column width & height	i	r
Insert a row or column	i	r
Delete row or column	i	r
Insert graphics	i	r
Retrieving data	3	4
Sort data	i	r
Create charts/graphs	i	r
Print spreadsheets	i	r

Creating - Coding	Stage 2	
What is Coding?	3	4
Introduction to coding – what is it?		
Simple examples of coding		
Examples -looking at script (page source code)	i	
SYMBOL BASED CODING		
Understanding symbol commands	3	4
Recognising Fwd, bwd, turn left, turn right		
Create Coding – Symbol based	3	4
Planning		
Program robot to move - fwd,/bwd, left/right		
Developing a sequence		
Running a sequence		
Modify coding - Problem solving		
Symbol Based Applications	3	4
<ul style="list-style-type: none"> • iPad apps (BeeBot/CodeAPillar/LightBox/ALEX/Kodable) • online software • BeeBots • Edisons • Code-A-Pillar • Ozobots 		
BLOCK BASED CODING	3	4
Planning (may be hands on for juniors)		
Developing a sequence		
Using code blocks		
Adding an “if” variation		
Adding “if/else”	r	
Include a repeat block		
Include a repeat “times” block		
Functions		
Parameters		
Create actions – simple		
Create actions – moderate	r	
Create actions – advanced		i

Communicating - Database	Stage 2	
Using databases	3	4
Use database for research		i
Understand terms such as “field”		i
Create a database	3	4
Cell, row, column	i	r

Creating -Multimedia	Stage 2	
Create a movie – iMovie	3	4
Become familiar with interface	i	r
Import & edit photos	i	r
Add text & recorded voice	i	r
Add transitions & effects	i	r
Add music	i	r
Add title screen & credits	i	r
Render & save	i	r
Create a movie – green screen/Dolnk	3	4
Become familiar with interface		i
Take, import & edit photos		i
Add text & recorded voice		i
Add transitions & effects		i
Add music		i
Render & save		i
Add title screen & credits		i
Create a movie – Movie Maker	3	4
Introduce Movie Maker interface	i	r
Import & edit photos/videos	i	r
Add text & recorded voice	i	r
Add transitions & effects	i	r
Add music	i	r
Render & save	i	r
Add title screen & credits	i	r
Use Notebook 10	3	4
Identify parts of interface	i	r
Use gallery/animations/special features	i	r

Creating - iPads	Stage 2	
Use an iPad	3	4
On/Off; Use slide wake		
Slide to change screens		
Opening apps		
Operating apps		
Closing apps		
Looking after iPod/Pad		
Printing from iPad	i	r
Transferring from an iPad	i	r

Creating - Coding	Stage 2	
Block Based Applications	3	4
iPad apps (Tynker; Daisy; Hopscotch)		
web based (Scratch; Hour of Code/code.org)		

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