

Shell Cove Public School

Science and Technology Scope & Sequence

Stage Two

Science EVEN Year – Term 1 and 2			Stage 2	
	Outcomes + Thinking Skills	Inquiry Questions	Content	Assessment
1	<ul style="list-style-type: none"> - ST2-4LW-S - Compares features and characteristics of living and non- living things. <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"> • Planning and Conducting Investigations • Processing and Analysing data • Communicating - Scientific Thinking – SciT - Systems Thinking – Sys-T 	<ul style="list-style-type: none"> - How can we group living things? - What are the similarities and differences between the life cycles of living things? - How are environments and living things interdependent? 	<p>Living World Primary Connections Unit: Feathers Fur of Leaves</p> <ul style="list-style-type: none"> - Collects data and identifies patterns to group living things according to their external features, and distinguish between from non-living things - Conducts an investigation into the life cycle of plants and/or animals - Describes how living things depend on each other and their environments to survive, for example; - bees and flowers - birds eat and disperse seeds 	<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"> - What occurs as a result of the interactions between the Earth and the sun? 	<p>Earth and Space Primary Connections Unit: Night Day</p> <ul style="list-style-type: none"> - Identifies the Sun as a major source of energy. - Investigates how the Earth’s rotation on its axis causes regular changes including night and day. - Constructs a way of observing and recording changes in the Sun’s position in one day. 	<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 EVEN Year – Term 3 and 4			Stage 2	
	Outcomes + Thinking Skills	Inquiry Questions	Content	Assessment
3	<ul style="list-style-type: none"> - ST2-7MW-T - Investigates the suitability of natural and processed materials for a range of purposes. <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"> • Questioning and Predicting • Planning and Conduct Investigations - Design Thinking – DesT - Scientific Thinking- SciT 	<ul style="list-style-type: none"> - How do you decide upon which material to use for a particular purpose? 	<p>Material World Primary Connections Unit: Package it better</p> <ul style="list-style-type: none"> - Investigates how the properties of natural and processed materials influence their suitability and use in products, services and/or environments, for example: elasticity, thermal conductivity. - Develops a design solution for an identified need or opportunity, using a variety of tools and materials that considers factors such as sustainability and time. - Identifies the roles of people working in science and technology occupations. 	<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.
4	<ul style="list-style-type: none"> - ST2-9PW-ST - Describes how contact and non-contact forces affect an object’s motion. <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"> • Planning and Conducting Investigations • Processing and Analysing data - Computational Thinking – ComT - Scientific Thinking- SciT - Systems Thinking – SysT 	<ul style="list-style-type: none"> - How can objects affect other objects with or without touching them? - How can we use forces and energy in a product or system? 	<p>Physical World Primary Connections Unit: Smooth Moves</p> <ul style="list-style-type: none"> - Observes how contact and non contact forces cause changes in the motion of objects, for example: changes in speed, changes in direction. - Investigates how forces and materials interact in a product or system to perform a function. 	<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

Term 3 and Term 4

- 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	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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Technology + STEM EVEN 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"> - Why do we represent data in different ways? - Authentic Link to Living World – Gardens to entice animals 	<p>Unit: Staying Safe Online + Changes in Technology</p> <ul style="list-style-type: none"> - Investigates digital and information systems, and explore how they meet personal, school or community needs 	<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 – Night and Day – Eclipse 	<p>Unit: To be written</p> <ul style="list-style-type: none"> - Designs and produces digital solutions using a visual programming language - Develops, records and communicates design ideas and decisions using appropriate technical terms. - Produces labelled and annotated drawings including digital graphic representations. 	<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 - Systems Thinking – Sys-T 	<ul style="list-style-type: none"> - What real world problem can we help to solve? - Authentic Link to Material World – Packaging for foods and slime products 	<p>Unit - Making nut free products from food</p> <ul style="list-style-type: none"> - Organises and perform strategic roles within a group to solve a problem - Collects, accesses and presents data, using software to present and communicate information and solve problems - Develops criteria to evaluate the environmental impact of a design with guidance - Explains how existing information systems meet common personal, school or community needs 	<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"> - 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 - Computational Thinking – Com-T 	<ul style="list-style-type: none"> - How do components of digital systems interact with each other to transmit data? - Authentic Link to Physical World – Tools to assist the elderly (push and pull action) 	<p>Unit – Using data to solve problems</p> <ul style="list-style-type: none"> - Collects, accesses and presents different types of data using simple software to create information and solve problems - Selects appropriate formats or layouts for data, depending on its type and audience, e.g. graphs, tables or infographics - Uses software to sort and calculate data when solving problems, e.g. calculations in spreadsheets - Plans, creates and communicates ideas and information, applying agreed ethical and social protocols 	<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 - Warrigal Care

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)		

i – introduced r – reinforced used independently Continue development