Truganina College

Inspiring Excellence in Learning to Believe, Achieve and Succeed.

Years F-6 STEM Overview
2022

Our school community is one with high expectations.
We are collaborative and inclusive of all.
We deliver a 21st century guaranteed and viable curriculum that results in outstanding student achievement.

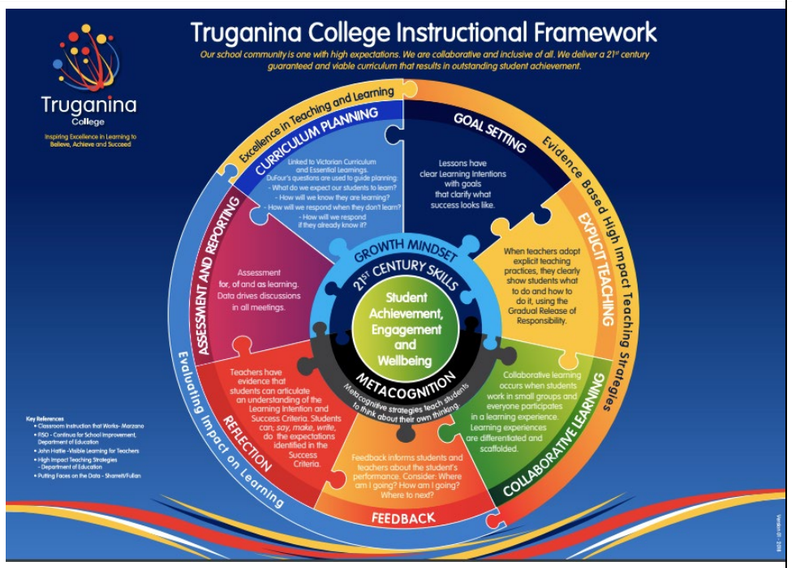
The STEM Curriculum links directly to:

HIGH IMPACT TEACHING STRATEGIES (HITS)

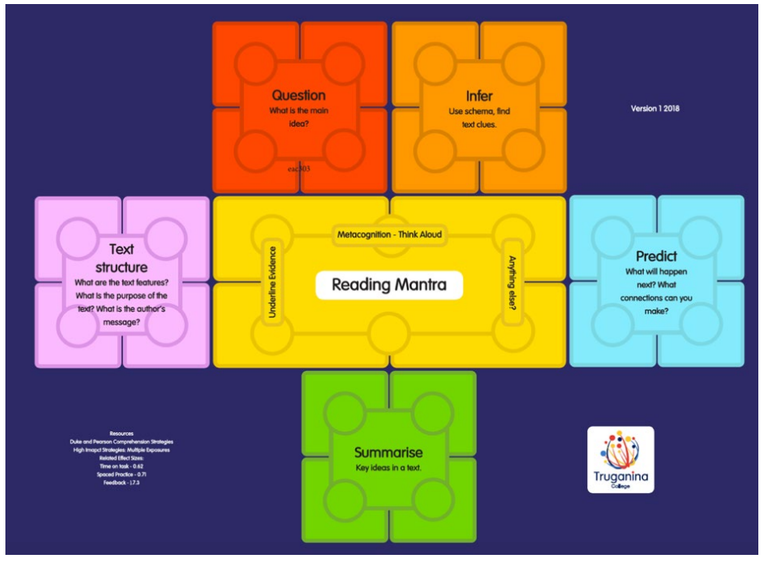
2020
2021
2022

The planning, teaching and learning of the STEM Curriculum link directly to the College's Strategic Plan goals:
Goal 1: To improve student learning outcomes in literacy and numeracy.
Goal 2: To empower students to become independent and self-regulating learners.
Goal 3: To enhance the health and wellbeing of all students.

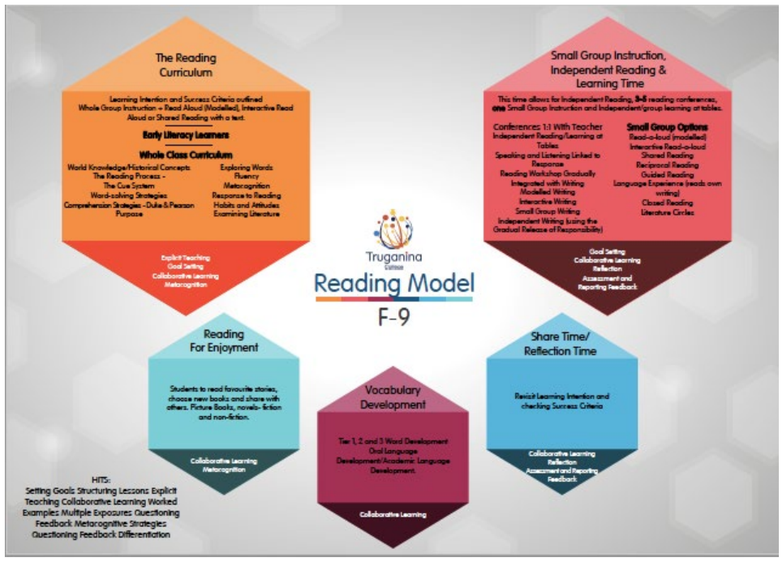
Instructional Framework



Reading Mantra



Reading Model



Curriculum Planning - Refer to DuFour's questions
What do we need our students to learn?
How will we know they are learning?
What will we do if they have already learned it?
What will we do if they have not learned?

Assessment & Reporting - Data drives discussion in all meetings

21st century learning

- Ways of Thinking: Creativity & Innovation, Critical Thinking, Problem Solving & Decision Making, Learning to Learn
- Ways of Working: Communication & Collaboration
- Ways of Living in the World: Local & Global Citizenship, Personal & Social Responsibility, Life & Career
- Tools for Working: Information Literacy, Information & Communication Technology (ICT) Literacy

Duke & Pearson Comprehension Strategies
Critical & Creative Thinking

	Term 1 - Biological Sciences	Term 2 - Chemical Sciences	Term 3 - Physical Sciences	Term 4 - Earth and Space Sciences
	IGNITE [Inquiry of Goals, New Ideas & Truganina's Expectations] CURRICULUM			
Foundation	**Science Understanding** (VCSSU042) - Living things have a variety of external features and live in different places where their basic needs, including food, water and shelter, are met (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS051) - Participate in guided investigations, including making observations using the senses, to explore and answer questions **Digital Technologies** (VCDTDI015) - Collect, explore and sort data, and use digital systems to present the data creatively **Design and Technologies** (VCDSTS013) - Identify how people create familiar designed solutions and consider sustainability to meet personal and local community needs **Critical and Creative Thinking** (VCCCTM007) - Consider ways to express and describe thinking activity, including the expression of feelings about learning, both to others and self **Duke and Pearson Comprehension Strategies** Questioning & Visualising	**Science Understanding** (VCSSU044) - Objects are made of materials that have observable properties (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS054) - Compare observations and predictions with those of others **Digital Technologies** (VCDTDS013) - Identify and explore digital systems (hardware and software components) for a purpose **Design and Technologies** (VCDSTC016) - Explore how food is selected and prepared for healthy eating **Critical and Creative Thinking** (VCCCTM009) - Investigate ways to problem-solve, using egocentric and experiential language **Duke and Pearson Comprehension Strategies** Questioning & Metacognition	**Science Understanding** (VCSSU048) - The way objects move depends on a variety of factors including their size and shape: a push or a pull affects how an object moves or changes shape (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS053) - Use a range of methods, including drawings and provided tables, to sort information **Digital Technologies** (VCDTDI014) - Recognise and explore patterns in data and represent data as pictures, symbols and diagrams **Design and Technologies** (VCDSTC014) - Explore how technologies use forces to create movement in designed solutions **Critical and Creative Thinking** (VCCCTR006) - Consider how reasons and examples are used to support a point of view and illustrate meaning **Duke and Pearson Comprehension Strategies** Questioning & Predicting	**Science Understanding** (VCSSU046) - Observable changes occur in the sky and landscape; daily and seasonal changes affect everyday life (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS050) - Respond to and pose questions, and make predictions about familiar objects and events **Digital Technologies** (VCDTDI014) - Recognise and explore patterns in data and represent data as pictures, symbols and diagrams **Design and Technologies** (VCDSCD018) - Explore needs or opportunities for designing, and the technologies needed to realise designed solutions **Critical and Creative Thinking** (VCCCTM008) - Explore some learning strategies, including planning, repetition, rewording, memorisation and use of mnemonics **Duke and Pearson Comprehension Strategies** Predicting & Inferring
Year 1	**Science Understanding** (VCSSU042) Living things have a variety of external features and live in different places where their basic needs, including food, water and shelter, are met (VCSSU041) - People use science in their daily lives	**Science Understanding** (VCSSU045) - Everyday materials can be physically changed or combined with other materials in a variety of ways for particular purposes (VCSSU041) - People use science in their daily lives	**Science Understanding** (VCSSU049) - Light and sound are produced by a range of sources and can be sensed People use science in their daily lives (VCSSU041) **Science Inquiry Skills** (VCSIS051) - Participate in guided investigations, including making observations using the senses, to explore and answer questions	**Science Understanding** (VCSSU046) - Observable changes occur in the sky and landscape; daily and seasonal changes affect everyday life (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS055) - Represent and communicate observations and ideas about changes in objects and events in a variety of ways

	Science Inquiry Skills (VCSIS052) - Use informal measurements in the collection and recording of observations **Digital Technologies** (VCDTDI016) - Independently and with others create and organise ideas and information using information systems, and share these with known people in safe online environments **Design and Technologies** (VCDSCD021) - Use personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment **Critical and Creative Thinking** (VCCCTR006) - Consider how reasons and examples are used to support a point of view and illustrate meaning **Duke and Pearson Comprehension Strategies** Questioning & Metacognition	**Science Inquiry Skills** (VCSIS053) - Use a range of methods, including drawings and provided tables, to sort information **Digital Technologies** (VCDTDI015) - Collect, explore and sort data, and use digital systems to present the data creatively **Design and Technologies** (VCDSCD022) - Sequence steps for making designed solutions **Critical and Creative Thinking** (VCCCTQ002) - Consider personal reactions to situations or problems and how these reactions may influence thinking **Duke and Pearson Comprehension Strategies** Predicting & Visualising	**Digital Technologies** (VCDTDI014) - Recognise and explore patterns in data and represent data as pictures, symbols and diagrams **Design and Technologies** (VCDSTC014) - Explore how technologies use forces to create movement in designed solutions **Critical and Creative Thinking** (VCCCTQ002) - Consider personal reactions to situations or problems and how these reactions may influence thinking **Duke and Pearson Comprehension Strategies** Questioning & Inferring	**Digital Technologies** (VCDTDI015) - Collect, explore and sort data, and use digital systems to present the data creatively **Design and Technologies** (VCDSCD019) - Visualise, generate, and communicate design ideas through describing, drawing and modelling **Critical and Creative Thinking** (VCCCTR004) - Examine words that show reasons and words that show conclusions **Duke and Pearson Comprehension Strategies** Visualising & Monitoring Comprehension
Year 2	**Science Understanding** (VCSSU043) - Living things grow, change and have offspring similar to themselves (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS055) - Represent and communicate observations and ideas about changes in objects and events in a variety of ways **Digital Technologies** (VCDTDS013) - Identify and explore digital systems (hardware and software components) for a purpose **Design and Technologies** (VCDSCD020) - Use materials, components, tools, equipment and techniques to produce designed solutions safely	**Science Understanding** (VCSSU045) - Everyday materials can be physically changed or combined with other materials in a variety of ways for particular purposes (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS054) - Compare observations and predictions with those of others (VCSIS051) - Participate in guided investigations, including making observations using the senses, to explore and answer questions **Digital Technologies** (VCDTCD017) - Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems	**Science Understanding** (VCSSU048) - The way objects move depends on a variety of factors including their size and shape: a push or a pull affects how an object moves or changes shape (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS052) - Use informal measurements in the collection and recording of observations (VCSIS054) - Compare observations and predictions with those of others **Digital Technologies** (VCDTCD017) - Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems	**Science Understanding** (VCSSU047) - Earth's resources are used in a variety of ways (VCSSU041) - People use science in their daily lives **Science Inquiry Skills** (VCSIS051) - Participate in guided investigations, including making observations using the senses, to explore and answer questions **Digital Technologies** (VCDTDS013) - Identify and explore digital systems (hardware and software components) for a purpose **Design and Technologies** (VCDSCD019) - Visualise, generate, and communicate design ideas through describing, drawing and modelling

	Critical and Creative Thinking (VCCCTR005) - Compare and contrast information and ideas in own and others reasoning **Duke and Pearson Comprehension Strategies** Questioning & Inferring	**Design and Technologies** (VCDSTC017) - Explore the characteristics and properties of materials and components that are used to create designed solutions **Critical and Creative Thinking** (VCCCTQ001) - Identify, describe and use different kinds of question stems to gather information and ideas **Duke and Pearson Comprehension Strategies** Predicting & Summarising	**Design and Technologies** (VCDSTC017) - Explore the characteristics and properties of materials and components that are used to create designed solutions **Critical and Creative Thinking** (VCCCTQ003) - Make simple modifications to known ideas and routine solutions to generate some different ideas and possibilities **Duke and Pearson Comprehension Strategies** Predicting & Questioning	**Critical and Creative Thinking** (VCCCTQ002) - Consider personal reactions to situations or problems and how these reactions may influence thinking **Duke and Pearson Comprehension Strategies** Inferring & Monitoring Comprehension
Year 3	**Science Understanding** (VCSSU057) - Living things can be grouped on the basis of observable features and can be distinguished from non-living things (VCSSU056) - Science knowledge helps people to understand the effects of their actions **Science Inquiry Skills** (VCSIS072) - Represent and communicate observations, ideas and findings to show patterns and relationships using formal and informal scientific language **Digital Technologies** (VCDTCD024) - Develop simple solutions as visual programs **Design and Technologies** (VCDSCD028) - Critique needs or opportunities for designing and explore and test a variety of materials, components, tools and equipment and the techniques needed to create designed solutions **Critical and Creative Thinking** (VCCCTQ010) - Construct and use open and closed questions for different purposes (VCCCTR017) - Explore distinctions when organising and sorting information and ideas from a range of sources	**Science Understanding** (VCSSU059) - A change of state between solid and liquid can be caused by adding or removing heat (VCSSU056) - Science knowledge helps people to understand the effects of their actions **Science Inquiry Skills** (VCSIS066) - Suggest ways to plan and conduct investigations to find answers to questions including consideration of the elements of fair tests **Digital Technologies** (VCDTCD023) - Define simple problems, and describe and follow a sequence of steps and decisions involving branching and user input (algorithms) needed to solve them **Design and Technologies** (VCDSTC027) - Investigate the suitability of materials, systems, components, tools and equipment for a range of purposes **Critical and Creative Thinking** (VCCCTQ011) - Explore reactions to a given situation or problem and consider the effect of pre-established preferences (VCCCTM020) - Investigate a range of problem-solving strategies, including brainstorming, identifying, comparing and selecting options, and developing and testing hypotheses	**Science Understanding** (VCSSU063) - Heat can be produced in many ways and can move from one object to another; a change in the temperature of an object is related to the gain or loss of heat by the object (VCSSU056) - Science knowledge helps people to understand the effects of their actions **Science Inquiry Skills** (VCSIS067) - Safely use appropriate materials, tools, equipment and technologies **Digital Technologies** (VCDTCD025) - Explain how student-developed solutions and existing information systems meet common personal, school or community needs **Design and Technologies** (VCDSTC025) - Investigate food and fibre production used in modern or traditional societies (VCDSTC026) - Investigate food preparation techniques used in modern or traditional societies **Critical and Creative Thinking** (VCCCTM019) - Examine an increased range of learning strategies, including visualisation, note-taking, peer instruction and incubation, and reflect on how these can be applied to different tasks to reach a goal	**Science Understanding** (VCSSU061) - Earth's rotation on its axis causes regular changes, including night and day (VCSSU056) - Science knowledge helps people to understand the effects of their actions **Science Inquiry Skills** (VCSIS069) - Use a range of methods including tables and column graphs to represent data and to identify patterns and trends **Digital Technologies** (VCDTDI020) - Recognise different types of data and explore how the same data can be represented in different ways **Design and Technologies** (VCDSCD029) - Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques **Critical and Creative Thinking** (VCCCTR016) - Identify and use 'If, then…' and 'what if…' reasoning **Duke and Pearson Comprehension Strategies** Inferring & Questioning

	Duke and Pearson Comprehension Strategies Inferring & Questioning	**Duke and Pearson Comprehension Strategies** Predicting & Metacognition	**Duke and Pearson Comprehension Strategies** Predicting & Inferring	
Year 4	**Science Understanding** (VCSSU058) - Different living things have different life cycles and depend on each other and the environment to survive (VCSSU056) - Science knowledge helps people to understand the effects of their actions **Science Inquiry Skills** (VCSIS070) - Compare results with predictions, suggesting possible reasons for findings **Digital Technologies** (VCDTDS019) - Explore a range of digital systems with peripheral devices for different purposes, and transmit different **Design and Technologies** (VCDSCD030) - Select and use materials, components, tools and equipment using safe work practices to produce designed solutions t **Critical and Creative Thinking** (VCCCTR013) - Examine and use the structure of a basic argument, with an aim, reasons and conclusion to present a point of view (VCCCTM018) - Consider concrete and pictorial models to facilitate thinking, including a range of visualisation strategies **Duke and Pearson Comprehension Strategies** Visualising & Summarising	**Science Understanding** (VCSSU060) - Natural and processed materials have a range of physical properties; these properties can influence their use (VCSSU056) - Science knowledge helps people to understand the effects of their actions **Science Inquiry Skills** (VCSIS068) - Use formal measurements in the collection and recording of observations **Digital Technologies** (VCDTDI021) - Collect, access and present different types of data using simple software to create information and solve problems **Design and Technologies** (VCDSTC024) - Investigate how forces and the properties of materials affect the behaviour of a designed solution **Critical and Creative Thinking** (VCCCTQ012) - Investigate different techniques to sort facts and extend known ideas to generate novel and imaginative ideas **Duke and Pearson Comprehension Strategies** Monitoring Comprehension & Inferring	**Science Understanding** (VCSSU064) - Forces can be exerted by one object on another through direct contact or from a distance (VCSSU056) - Science knowledge helps people to understand the effects of their actions **Science Inquiry Skills** (VCSIS071) - Reflect on an investigation, including whether a test was fair or not **Digital Technologies** (VCDTCD023) - Define simple problems, and describe and follow a sequence of steps and decisions involving branching and user input (algorithms) needed to solve them **Design and Technologies** (VCDSCD032) - Plan a sequence of production steps when making designed solutions **Critical and Creative Thinking** (VCCCTR015) - Investigate why and when the consequences of a point of view should be considered **Duke and Pearson Comprehension Strategies** Predicting & Metacognition	**Science Understanding** (VCSSU062) - Earth's surface changes over time as a result of natural processes and human activity (VCSSU056) - Science knowledge helps people to understand the effects of their actions **Science Inquiry Skills** (VCSIS065) - With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge **Digital Technologies** (VCDTDI022) - Individually and with others, plan, create and communicate ideas and information safely, applying agreed ethical and social protocols **Design and Technologies** (VCDSTS023) - Recognise the role of people in design and technologies occupations and explore factors, including sustainability, that impact on the design of solutions to meet community needs (VCDSCD031) - Evaluate design ideas, processes and solutions based on criteria for success developed with guidance and including care for the environment and communities **Critical and Creative Thinking** (VCCCTR014) - Distinguish between main and peripheral ideas in own and others information and points of view **Duke and Pearson Comprehension Strategies** Inferring & Questioning
Year 5	**Science Understanding** (VCSSU074) - Living things have structural features and adaptations that help them to survive in their environment	**Science Understanding** (VCSSU076) - Solids, liquids and gases behave in different ways and have observable properties that help to classify them	**Science Understanding** (VCSSU080) - Light from a source forms shadows and can be absorbed, reflected and refracted	**Science Understanding** (VCSSU078) - Earth is part of a system of planets orbiting around a star (the Sun)

	(VCSSU073) - Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives **Science Inquiry Skills** (VCSIS088) - Communicate ideas and processes using evidence to develop explanations of events and phenomena and to identify simple cause-and-effect relationships **Digital Technologies** (VCDTCD031) - Design a user interface for a digital system, generating and considering alternative design ideas **Design and Technologies** (VCDSCD038) - Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended designed solutions **Critical and Creative Thinking** (VCCCTR025) - Consider the importance of giving reasons and evidence and how the strength of these can be evaluated **Duke and Pearson Comprehension Strategies** Inferring & Summarising	(VCSSU073) - Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives **Science Inquiry Skills** (VCSIS082) - With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be based on previous experiences or general rules **Digital Technologies** (VCDTCD030) - Define problems in terms of data and functional requirements, drawing on previously solved problems to identify similarities **Design and Technologies** (VCDSCD039) - Generate, develop, communicate and document design ideas and processes for audiences using appropriate technical terms and graphical representation techniques **Critical and Creative Thinking** (VCCCTQ022) - Experiment with alternative ideas and actions by setting preconceptions to one side (VCCCTQ023) - Identify and form links and patterns from multiple information sources to generate non-routine ideas and possibilities **Duke and Pearson Comprehension Strategies** Predicting, Visualising & Text Structure	(VCSSU073) - Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives **Science Inquiry Skills** (VCSIS083) - With guidance, plan appropriate investigation types to answer questions or solve problems and use equipment, technologies and materials safely, identifying potential risks **Design and Technologies** (VCDSTC037) - Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use **Critical and Creative Thinking** (VCCCTR024) - Investigate common reasoning errors including contradiction and inconsistency, and the influence of context **Duke and Pearson Comprehension Strategies** Inferring & Summarising	(VCSSU073) - Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives **Science Inquiry Skills** (VCSIS087) - Suggest improvements to the methods used to investigate a question or solve a problem **Digital Technologies** (VCDTCD033) - Develop digital solutions as simple visual programs (VCDTDI029) - Plan, create and communicate ideas, information and online collaborative projects, applying agreed ethical, social and technical protocols **Design and Technologies** (VCDSCD040) - Apply safe procedures when using a variety of materials, components, tools, equipment and techniques to produce designed solutions **Critical and Creative Thinking** (VCCCTM030) - Examine learning strategies, including constructing analogies, visualising ideas, summarising and paraphrasing information and reflect on the application of these strategies in different situations **Duke and Pearson Comprehension Strategies** Visualising & Summarising
Year 6	**Science Understanding** (VCSSU075) - The growth and survival of living things are affected by the physical conditions of their environment (VCSSU073) - Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives	**Science Understanding** (VCSSU077) - Changes to materials can be reversible, including melting, freezing, evaporating, or irreversible, including burning and rusting (VCSSU073)- Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives	**Science Understanding** (VCSSU081) - Energy from a variety of sources can be used to generate electricity; electric circuits enable this energy to be transferred to another place and then to be transformed into another form of energy (VCSSU073) - Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives	**Science Understanding** (VCSSU079) - Sudden geological changes or extreme weather conditions can affect Earth's surface (VCSSU073) - Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives

	Science Inquiry Skills (VCSIS086) - Compare data with predictions and use as evidence in developing explanations **Digital Technologies** (VCDTCD032) - Design, modify and follow simple algorithms represented diagrammatically and in English, involving sequences of steps, branching, and iteration **Design and Technologies** (VCDSTC035) - Investigate how and why food and fibre are produced in managed environments **Critical and Creative Thinking** (VCCCTR026) - Consider when analogies might be used in expressing a point of view and how they should be expressed and evaluated **Duke and Pearson Comprehension Strategies** Inferring & Text Structure	**Science Inquiry Skills** (VCSIS084) - Decide which variables should be changed, measured and controlled in fair tests and accurately observe, measure and record data **Digital Technologies** (VCDTDI028) - Acquire, store and validate different types of data and use a range of software to interpret and visualise data to create information **Design and Technologies** (VCDSTC036) - Investigate the role of food preparation in maintaining good health and the importance of food safety and hygiene **Critical and Creative Thinking** (VCCCTR027) - Examine the difference between valid and sound arguments and between inductive and deductive reasoning, and their degrees of certainty **Duke and Pearson Comprehension Strategies** Predicting & Questioning	**Science Inquiry Skills** (VCSIS085) - Construct and use a range of representations, including tables and graphs, to record, represent and describe observations, patterns or relationships in data **Digital Technologies** (VCDTDS026) - Examine the main components of common digital systems, and how such digital systems may connect together to form networks to transmit data (VCDTDI027) - Examine how whole numbers are used as the basis for representing all types of data in digital systems **Design and Technologies** (VCDSTC034) - Investigate how forces or electrical energy can control movement, sound or light in a designed product or system (VCDSCD042) - Develop project plans that include consideration of resources when making designed solutions **Critical and Creative Thinking** (VCCCTR028) - Explore what a criterion is, different kinds of criteria, and how to select appropriate criteria for the purposes of filtering information and ideas (VCCCTM029) - Investigate thinking processes using visual models and language strategies **Duke and Pearson Comprehension Strategies** Visualising & Predicting	**Science Inquiry Skills** (VCSIS087) - Suggest improvements to the methods used to investigate a question or solve a problem **Digital Technologies** (VCDTCD034) - Explain how student-developed solutions and existing information systems meet current and future community and sustainability needs **Design and Technologies** (VCDSTS033) - Investigate how people in design and technologies occupations address competing considerations, including sustainability, in the design of solutions for current and future use (VCDSCD041) - Negotiate criteria for success that include consideration of environmental and social sustainability to evaluate design ideas, processes and solutions **Critical and Creative Thinking** (VCCCTQ021) - Examine how different kinds of questions can be used to identify and clarify information, ideas and possibilities (VCCCTM031) - Investigate how ideas and problems can be disaggregated into smaller elements or ideas, how criteria can be used to identify gaps in existing knowledge, and assess and test ideas and proposals **Duke and Pearson Comprehension Strategies** Monitoring Comprehension & Inferring

Last Updated: 22nd February 2022