Science Curriculum
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1. COMMUNITY PROFILE

Mission Statement
Our mission at St Teresa’s School is to develop a community of faith, based on belief in God and a Christian way of Life. These values are taught by and experienced through the commitment of a caring staff. Together in partnership, the family and the school nurture the overall development of the child, encouraging him/her to attain his/her highest potential. Positive relationships are encouraged through respect for one another, a sense of kindness and fairness and concern for others.

Relationships are further reinforced through promoting self-discipline and personal responsibility in an atmosphere of trust and forgiveness. It is always remembered that strong family values and close communication between home and school, create an atmosphere where God’s presence is treasured.

In establishing the Science Curriculum at St Teresa’s School, the input of all the staff was considered and valued. The Diocesan Science Sequence and Scope Document has been produced as a resource by the Cairns Catholic Education Services (CES) to support the design of school programs. The Science Sequence and Scope document is used by teachers to plan, teach and assess science. This document has been compiled using National Statements of Learning (NSLs) for Years 3, 5, 7 Science. Professional Learning for staff in the Primary Connections has been ongoing over the past 3 years at St Teresa’s provided by the Diocesan Education Services. Located on ‘My Classes’ is a document called: Primary Connections - alignment with the draft Australian Curriculum: Science.

St Teresa’s School was opened in 1950. It was staffed by the Sisters of Mercy until 1978. Now it is staffed entirely by lay teachers. It has 123 students from prep to year 7. The school consists of 6 classrooms, an office area, library, a tuck-shop, a playing field, an adventure playground and a sports court.

Ravenshoe is a farming community producing beef, dairy, corn, peanuts, avocados and vegetables. It has a timber mill which now only produces plywood, after a history of timber cutting for many years. This large industry was lost after world heritage decisions were made around 1990.

Ravenshoe is a rural community in a remote location. Because of changes in the timber industry and other factors, employment opportunities have become more limited. Travel out of town is common for permanent employment. For the most part, any activities in which children participate after school require transportation to surrounding towns.

Up until this year, Priority Country Area Program (PCAP) has funded the school for many academic and social emotional programs which would otherwise be unavailable to the school. From 2010, because of new Regional Council boundary changes, St Teresa’s may no longer be eligible for PCAP funding. The impact of this decision will be high. Negotiations are still occurring regarding this.
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St Teresa’s recognizes the role of parents in the education process of the child and desires a high correlation between home and school values. The goal of the school is to work with parents to develop each child academically, emotionally, socially, physically and spiritually.

It is our goal to create an atmosphere inspired by love, a concern for one another and a relationship with God. We are fortunate that our small numbers promotes the achievement of this goal.

2. LEARNING AREA RATIONALE

Science provides an empirical way of answering interesting and important questions about the biological, physical and technological world. The knowledge it produces has proved to be a reliable basis for action in our personal, social and economic lives. Science is a dynamic, collaborative and creative human endeavour arising from our desire to make sense of our world through exploring the unknown, investigating universal mysteries, making predictions and solving problems. Science aims to understand a large number of observations in terms of a much smaller number of broad principles. Science knowledge is contestable and is revised, refined and extended as new evidence arises.

The Australian Curriculum: Science provides opportunities for students to develop an understanding of important science concepts and processes, the practices used to develop scientific knowledge, of science’s contribution to our culture and society, and its applications in our lives. The curriculum supports students to develop the scientific knowledge, understandings and skills to make informed decisions about local, national and global issues and to participate, if they so wish, in science-related careers.

In addition to its practical applications, learning science is a valuable pursuit in its own right. Students can experience the joy of scientific discovery and nurture their natural curiosity about the world around them. In doing this, they develop critical and creative thinking skills and challenge themselves to identify questions and draw evidence-based conclusions using scientific methods. The wider benefits of this “scientific literacy” are well established, including giving students the capability to investigate the natural world and changes made to it through human activity.

The science curriculum promotes six overarching ideas that highlight certain common approaches to a scientific view of the world and which can be applied to many of the areas of science understanding. These overarching ideas are patterns, order and organisation; form and function; stability and change; systems; scale and measurement; and matter and energy.
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The teaching of Science allows our students to access and understand critical information which will enable them to make informed decisions and to participate fully as scientifically literate citizens in their everyday lives. To achieve this aim, St Teresa’s staff believes that the Diocesan Learning framework is reflected in how we teach science in the following ways by:

- Engaging and encouraging student participation in scientific activities
- Generating scientific questions
- Individually and collaboratively planning with students and teachers in conducting simple investigations
- Promote reflection of their learning and understanding of science in everyday situations.

Ref: Diocese of Cairns Learning Framework (2007)

3. BROAD SUBJECT AIMS:

The Australian Curriculum: Science aims to ensure that students develop:

- an interest in science as a means of expanding their curiosity and willingness to explore, ask questions about and speculate on the changing world in which they live
- an understanding of the vision that science provides of the nature of living things, of the Earth and its place in the cosmos, and of the physical and chemical processes that explain the behaviour of all material things
- an understanding of the nature of scientific inquiry and the ability to use a range of scientific inquiry methods, including questioning; planning and conducting experiments and investigations based on ethical principles; collecting and analysing data; evaluating results; and drawing critical, evidence-based conclusions
- an ability to communicate scientific understanding and findings to a range of audiences, to justify ideas on the basis of evidence, and to evaluate and debate scientific arguments and claims
- an ability to solve problems and make informed, evidence-based decisions about current and future applications of science while taking into account ethical and social implications of decisions
- an understanding of historical and cultural contributions to science as well as contemporary science issues and activities and an understanding of the diversity of careers related to science
- a solid foundation of knowledge of the biological, chemical, physical, Earth and space sciences, including being able to select and integrate the scientific knowledge and methods needed to explain and predict phenomena, to apply that understanding to new situations and events, and to appreciate the dynamic nature of science knowledge
YEARS K – 2 (TYPICALLY FROM 5 TO 8 YEARS OF AGE)

Curriculum focus: awareness of self and the local world

Young children have an intrinsic curiosity about their immediate world and a desire to explore and investigate things around them. Asking questions leads to speculation and the testing of ideas. Exploratory, purposeful play is a central feature of their investigations. Observation, using the senses in dynamic ways, is an important skill to be developed in these years. Observation leads into the idea of order that involves describing, comparing and sorting.

<table>
<thead>
<tr>
<th>Science understanding</th>
<th>comparing sorting and classifying objects and materials</th>
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<tbody>
<tr>
<td></td>
<td>pushes, pulls, position and motion of objects</td>
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<tr>
<td></td>
<td>living and non-living things</td>
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<td></td>
<td>needs, structures and growth of organisms</td>
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<td></td>
<td>objects in the sky</td>
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<td>changes on earth and the effects of living things.</td>
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<table>
<thead>
<tr>
<th>Science inquiry skills</th>
<th>explore, be curious and wonder</th>
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<tbody>
<tr>
<td></td>
<td>ask questions and begin to investigate</td>
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<tr>
<td></td>
<td>describe what has happened</td>
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<td></td>
<td>make and share observations</td>
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<td></td>
<td>use evidence to support ideas.</td>
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<tr>
<th>Science as a human endeavour</th>
<th>recognize aspects of science in everyday life</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>identify work associated with science in the community</td>
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<tr>
<td></td>
<td>care for the environment.</td>
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Unifying ideas for students in this age range are:

- **Exploration**: Investigation of objects and things around them as a precursor to more directed inquiry in later years.
- **Observation**: Using the senses to observe and gather information about the environment, looking for what is the same and what is different.
- **Order**: Observing similarities and differences and comparing, sorting and classifying to create an order that is more meaningful.
- **Change**: There are many changes that occur in the world. Changes occur in materials, the position of objects, and the growth cycles of plants and animals. Some of these changes are reversible, but many are not. These changes vary in their rate and their scale.
- **Questioning and speculating**: Questions and ideas about the world become increasingly purposeful; explanatory ideas are developed and tested through further exploration.
YEARS 3 – 6 (TYPICALLY FROM 8 TO 12 YEARS OF AGE)

Curriculum focus: recognising questions that can be investigated scientifically and investigating them

During these years students will have the opportunity to develop ideas about science that relate to their life and living. A broad range of science concepts will be explored. Within these, the unifying ideas of patterns, systems, cause and effect, and evidence and explanation will be developed.

In the early years of primary school, students will tend to use a trial-and-error approach to their science investigations. As they progress through these years, the expectation is that they will begin to work in a more systematic way. The notion of a ‘fair test’ and the idea of variables will be developed, as well as other forms of science inquiry. Understanding the importance of measurement will also be fostered.

| Science understanding | properties and uses of materials  
|                       | forces and motion  
|                       | forms, use and transfer of energy  
|                       | structures and functions of living things  
|                       | life cycles of organisms  
|                       | living things and the environment  
|                       | changes on earth and in space  
|                       | relationship between earth, moon and sun  
|                       | earth’s resources and their uses.  
| Science inquiry skills | identify questions and predictions for testing  
|                       | plan and conduct simple investigations  
|                       | observe, describe and measure  
|                       | collect, record and present data as tables, diagrams or descriptions  
|                       | analyse data, describe and explain relationships  
|                       | discuss and compare results with predictions  
|                       | draw conclusions and communicate ideas and understandings.  
| Science as a human endeavour | consider how science is used in work and leisure  
|                       | become aware of science related careers  
|                       | recognize the effect of science and technology on our environment  
|                       | be aware of the historical nature of science ideas.  

Building on the unifying ideas of exploration, observation, order, change, questioning and speculating, the unifying ideas of this age range are:

- **Patterns**: Through observation one can detect similarities among objects, living things and events. These similarities form patterns that underlie the idea of regular repetition. By identifying these patterns in nature, explanations can be developed about the reasons for them.

- **Systems**: The world is complex but can be understood by focusing on its smaller components. Understanding develops by examining these smaller components, or parts, and how they are related. Groups of parts that work together as a whole are commonly described as systems. There are also systems within systems, or subsystems. For example, an animal can be regarded as a system and within the animal there can be subsystems, such as the nervous system. There are many types of systems. Some examples are: a pond, a network, a particular machine, a school, the solar system.

- **Cause and effect**: An important aspect of science investigation is the study of relationships between different factors or variables. Cause and effect is an important kind of relationship. Examples of cause and effect questions are: If a plant dies, what are the factors that caused its death? If a person develops a skin rash, what has caused that rash?

- **Evidence and explanations**: Evidence is the driving force of science knowledge. From the data derived from observation, explanations about phenomena can be developed and tested. With new evidence, explanations may be refined or may change.

**YEARS 7 – 10 (TYPICALLY FROM 12 TO 15 YEARS OF AGE)**

Curriculum focus: explaining phenomena involving science and its applications.

During these years, students study science concepts associated with each of the disciplines: biology, physics, chemistry and earth science. It is important to include contemporary contexts in which science can be learned and issues and recent research to enhance understanding of science in the world. It is current research and its human uses and implications that motivates and excites students.

In determining what concepts students should learn, it is important to exercise restraint and avoid overcrowding the curriculum, and so provide time to build the knowledge base that underlies science understanding. The unifying ideas of energy, sustainability of systems, equilibrium and interdependence lead to the ideas of form and function that result in a deeper appreciation of evidence, models, explanations and theories.
<table>
<thead>
<tr>
<th>Science understanding</th>
<th>Physics and chemistry</th>
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<tbody>
<tr>
<td></td>
<td>nature of matter, including particle theory</td>
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<tr>
<td></td>
<td>forms of energy, energy transfer and storage</td>
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<td></td>
<td>forces and motion</td>
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<td></td>
<td>acids and bases</td>
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<td></td>
<td>metals and non-metals</td>
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<tr>
<td></td>
<td>elements, compounds and chemical reactions.</td>
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<tr>
<td>Biology</td>
<td>cells and living things</td>
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<tr>
<td></td>
<td>the human body</td>
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<td></td>
<td>ecosystems</td>
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<td></td>
<td>theory of evolution and the diversity of living things.</td>
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<tr>
<td>Earth science</td>
<td>structure of the earth and geological history</td>
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<tr>
<td></td>
<td>plate tectonics and geological phenomena</td>
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<tr>
<td></td>
<td>stars, galaxies and the universe.</td>
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</tbody>
</table>

| Science inquiry skills | formulate scientific questions or hypotheses for testing |
|                       | design and conduct science investigations involving measurement |
|                       | and repeated trials |
|                       | gather and organise data from a variety of sources |
|                       | analyse and test models and theories based on the evidence |
|                       | available |
|                       | explain and summarise patterns in data using science concepts. |

| Science as a human endeavour | be aware of contemporary issues such as water and its |
|                             | management, climate change, stem cell research, nanotechnology, |
|                             | gene technology |
|                             | apply scientific understandings to make responsible, ethical and |
|                             | informed decisions about issues |
|                             | be aware of the nature of science and research of Australian |
|                             | scientists |
|                             | appreciate that science provides rewarding careers |
|                             | appreciate the diversity of people who have contributed to, and |
|                             | shaped the development of, science. |
Building on the unifying ideas of exploration, observation, order, change, questioning and speculating, patterns, systems, cause and effect, evidence and explanations, the unifying ideas of this age range are:

- **Energy**: Energy is the basis of all activity. There are different forms of energy and energy is transferred between these forms. A guiding principle is that energy is always conserved. A challenge for humans is to use energy wisely.

- **Sustainability**: The idea of sustainability is central to the nature of dynamic systems. A system has inputs, outputs and a variety of internal functions. The interaction of these inputs, functions and outputs determines the degree to which any system can sustain itself. The inputs include resources that may be renewable or non-renewable.

- **Equilibrium and interdependence**: In a system there are forces and changes that act in opposing directions. For a system to be stable, these factors need to be in a state of balance or equilibrium. This equilibrium is based on the interdependence of all the components within the system. A change in one of the components can affect all components of the system because of the interrelationships between the parts.

- **Form and function**: For objects and organisms, form and function are complementary. Form describes the nature or make-up of an aspect of an object or organism, while function represents the use of that aspect. For example, the form of a particular bone in the human body is specifically suited to its use.

- **Evidence, models, explanations and theories**: Just as evidence provides the basis of explanations, explanations are used and refined to form models and theories. Models and theories are more complex; abstract schemes or structures that provide a more detailed but tentative basis for understanding a range of evidence.

Ref: Shape of the Australian Curriculum: Science Commonwealth of Australia 2009

4. CROSS CURRICULUM PRIORITIES

Cross Curriculum Priorities equip young Australians with the skills, knowledge and understanding that will enable them to engage effectively with and prosper in a globalised world. Students will gain personal and social benefits, be better equipped to make sense of the world in which they live and make an important contribution to building the social, intellectual and creative capital of our nation.

Science provides considerable opportunity for students to explore, understand and appreciate the wider world through the integration of across curriculum perspectives. The following statements about cross curriculum content indicate ways in which the following areas are embedded whilst ensuring that subject integrity is maintained.
CATHOLIC ETHOS

The overarching purpose of Catholic schools of the past, as well as the future, is to bring the Good News of Jesus to all who hear it. In the midst of a world of educational, social and economic change the focus on the holistic growth of the individual remains the surest way catholic school can prepare students for the uncertainties of the future.

Defining Features, Diocese of Cairns

The curriculum provides opportunities for young people to connect their curriculum experiences to a living Christian faith.

How does being a Catholic school impact on our teaching of Science?

The teaching styles of our staff should reflect Gospel values. In relation to teaching science, students should be aware of ‘ethical research’. As Christians, science would promote an improved world for the betterment of others. Values of sustainability and stewardship of local, national and world wide environments and a duty of care to our world in general, needs to be expressed in everyday science discussions and lessons. The LA of Science lends itself very well to improving our surroundings for the common good.

ABORIGINAL AND TORRES STRAIT ISLANDER HISTORIES AND CULTURES

Active engagement of inclusive curriculum practices which reflect Aboriginal and Torres Strait Islander perspectives, knowledge, histories, cultures and spirituality. A genuine commitment to Reconciliation, guided by principles of personal dignity, social justice and equity, which reflects the Gospel message and the mission of the Church.

The curriculum provides opportunities to value and respect:

1. traditional knowledge and practices
2. culture and natural heritage
3. spirituality

and to critically examine and/or challenge:

1. social constructs
2. prejudice and racism

To provide quality education for all learners at St Teresa’s it is essential that we ensure active engagement of inclusive curriculum practices which reflect Aboriginal and Torres Strait Islander perspectives, knowledge, histories, cultures and spirituality.

In Science at St Teresa’s we will:
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- Critically choose content and resources which are culturally appropriate and inclusive
- Challenge stereotypes and assumptions based on race
- Provide concrete science experiences which enable students to relate scientific concepts to their own lives
- Encourage and maintain communication and sharing of expertise and resources with Aboriginal and Torres Strait Islander parents, families and community elders.
- Have high expectations for all of our student
- Access CES Education Officer – Indigenous Education (Ms. Lillian Miller);
- Access Local Indigenous Elder: Maisy Barlow; June Mackay.

ASIA AND AUSTRALIA’S ENGAGEMENT WITH ASIA

This perspective requires students to develop skills, knowledge and understandings related to Asia and Australia’s engagement with Asia.

The curriculum provides opportunities to know, understand and be able to:

1. Understand ‘Asia’
2. Develop informed attitudes and values
3. Know about contemporary and traditional Asia
4. Connect Australia and Asia
5. Communicate effectively with people of the Asian region both within and outside Australia confidently

Through the teaching of science students will experience opportunities to

- Recognize the influence of the Asian region in respect to globalization e.g. global warming
- Value the significance of traditional and modern Asian scientific practices and skills e.g. technology, space travel, medicine
- Identify the impact of the Asian populations’ continuing contributions to scientific knowledge, research and practice supporting future scientific developments.

SUSTAINABILITY

Education for sustainability develops the knowledge, skills and values necessary for people to act in ways that contribute to more sustainable patterns of living. It is futures-oriented, focusing on protecting environments and creating a more ecologically and socially just world through action that recognises the relevance and interdependence of environmental, social, cultural and economic considerations. The curriculum provides opportunities to reflect upon:
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- the gift of creation
- an attitude of responsible stewardship and to critically examine and/or challenge:
  - the impact of human interaction with the natural, built and social environment
  - current environmental issues

In Science St Teresa’s will support this perspective by:

- Including current data about environmental issues where possible.
- Collecting our own data relating to sustainability and how it relates to our use of resources and energy in our school and town

SOCIAL EMOTIONAL LEARNING

Social and emotional competencies are integral to academic and work success and are the basis of resilience, relational quality and social capital.

The curriculum provides opportunities to develop:

1. Self Awareness
2. Social Awareness
3. Responsible Decision Making
4. Self-Management
5. Relationship Management

The You Can Do It program is an important element of the whole school approach to social emotional learning at St Teresa’s School. SEL teaches the skills children need to handle themselves, their relationships and their work, effectively and ethically.

Reinforce the ‘Keys to Success’ (Emotional Resilience, Confidence, Organisation, Persistence and Getting Along) and ‘Habits of Mind’ within the context of Science on a regular basis

Refer to ‘Keys to Success’ and ‘Habits of Mind’ whenever relevant in class e.g. a student is struggling with a difficult science concept or difficulty in working cooperatively in a group which is a major way of working in this KLA.

INCLUSIVE EDUCATION

It is by the quality of interactions and relationships that all students learn to understand and appreciate difference, to value diversity and learn to respond with dignity and respect to all through mutually enriching interactions.

The curriculum provides equitable access for and/or positive interactions with students from different backgrounds and with diverse needs and abilities.
Inclusive Education means providing equitable access to the curriculum for students with physical or intellectual disabilities: those with learning difficulties; students who experience poverty, abuse, neglect or isolation; those who have emotional or behavioural difficulties; and those who experience social alienation. This perspective also encompasses students with particular gifts and talents.

When planning at St Teresa’s School, teachers identify educational adjustments required to accommodate students identified either from the Learning Support Teacher, culturally different, gifted/talented or someone who is known to have a very different learning style to the majority.

At St Teresa’s teachers keep community context in mind in planning investigations and applying scientific explanations to various contexts e.g. agricultural, rural, green energy (windmills); hydro (Tully-Millstream) etc

5. GENERAL CAPABILITIES

General capabilities encompass skills, behaviours and dispositions that students develop and apply to content knowledge and that support them in becoming successful learners, confident and creative individuals and active and informed citizens.

Throughout their schooling students develop and use these capabilities in their learning across the curriculum, in co-curricular programs and in their lives outside school.

LITERACY

Students become literate as they develop the skills to learn and communicate confidently at school and to become effective individuals, community members, workers and citizens. These skills include listening, reading, viewing, writing, speaking and creating print, visual and digital materials accurately and purposefully within and across all learning areas.

Literacy involves students engaging with the language and literacy demands of each learning area.

As they become literate students learn to:

- interpret, analyse, evaluate, respond to and construct increasingly complex texts (Comprehension and composition)
- understand, use, write and produce different types of text (Texts)
- manage and produce grammatical patterns and structures in texts (Grammar)
- make appropriate word selections and decode and comprehend new (basic, specialised and technical) vocabulary (Vocabulary)
- use and produce a range of visual materials to learn and demonstrate learning (Visual information)
NUMERACY

Students become numerate as they develop the capacity to recognise and understand the role of mathematics in the world around them and the confidence, willingness and ability to apply mathematics to their lives in ways that are constructive and meaningful.

As they become numerate, students develop and use mathematical skills related to:

- Calculation and number
- Patterns and relationships
- Proportional reasoning
- Spatial reasoning
- Statistical literacy
- Measurement

INFORMATION AND COMMUNICATION TECHNOLOGY

Students develop ICT competence when they learn to:

- Investigate with ICT: using ICT to plan and refine information searches; to locate and access different types of data and information and to verify the integrity of data when investigating questions, topics or problems
- Create with ICT: using ICT to generate ideas, plans, processes and products to create solutions to challenges or learning area tasks
- Communicate with ICT: using ICT to communicate ideas and information with others adhering to social protocols appropriate to the communicative context (purpose, audience and technology)
- Operate ICT: applying technical knowledge and skills to use ICT efficiently and to manage data and information when and as needed
- Apply appropriate social and ethical protocols and practices to operate and manage ICT.

CRITICAL AND CREATIVE THINKING

Students develop critical and creative thinking as they learn to generate and evaluate knowledge, ideas and possibilities, and use them when seeking new pathways or solutions. In learning to think broadly and deeply students learn to use reason and imagination to direct their thinking for different purposes. In the context of schooling, critical and creative thinking are integral to activities that require reason, logic, imagination and innovation.

As they develop critical and creative thinking students learn to:
• pose insightful and purposeful questions
• apply logic and strategies to uncover meaning and make reasoned judgments
• think beyond the immediate situation to consider the ‘big picture’ before focusing on the detail
• suspend judgment about a situation to consider alternative pathways
• reflect on thinking, actions and processes
• generate and develop ideas and possibilities
• analyse information logically and make reasoned judgments
• evaluate ideas and create solutions and draw conclusions
• assess the feasibility, possible risks and benefits in the implementation of their ideas
• transfer their knowledge to new situations

ETHICAL BEHAVIOUR

Students develop ethical behaviour as they learn to understand and act in accordance with ethical principles. This includes understanding the role of ethical principles, values and virtues in human life; acting with moral integrity; acting with regard for others; and having a desire and capacity to work for the common good.

As they develop ethical behaviour students learn to:

• recognise that everyday life involves consideration of competing values, rights, interests and social norms
• identify and investigate moral dimensions in issues
• develop an increasingly complex understanding of ethical concepts, the status of moral knowledge and accepted values and ethical principles
• explore questions such as:
  o What is the meaning of right and wrong and can I be sure that I am right?
  o Why should I act morally?
  o Is it ever morally justifiable to lie?
  o What role should intuition, reason, emotion, duty or self-interest have in ethical decision making?

PERSONAL AND SOCIAL COMPETENCE

Students develop personal and social competence as they learn to understand and manage themselves, their relationships, lives, work and learning more effectively. This involves recognising and regulating their emotions, developing concern for and understanding of others, establishing positive relationships, making responsible decisions, working effectively in teams and handling challenging situations constructively.
As they develop personal and social competence students learn to:

- recognise and understand their own emotions, values and strengths, have a realistic assessment of their own abilities and a well-grounded sense of self-esteem and self-confidence (Self-awareness)
- manage their emotions and behaviour, persevere in overcoming obstacles, set personal and academic goals, develop self-discipline, resilience, adaptability and initiative (Self-management)
- perceive and understand other people’s emotions and viewpoints, show understanding and empathy for others, identify the strengths of team members, define and accept individual and group roles and responsibilities, be of service to others (Social awareness)
- form positive relationships, manage and influence the emotions and moods of others, cooperate and communicate effectively with others, work in teams, build leadership skills, make decisions, resolve conflict and resist inappropriate social pressure (Social management).

INTERCULTURAL UNDERSTANDING

Students develop intercultural understanding as they learn to understand themselves in relation to others. This involves students valuing their own cultures and beliefs and those of others, and engaging with people of diverse cultures in ways that recognise commonalities and differences, create connections and cultivate respect between people.

As they develop intercultural understanding students learn to:

- identify increasingly sophisticated characteristics of their own cultures and the cultures of others
- recognise that their own and others’ behaviours, attitudes and values are influenced by their languages and cultures
- consider what it might be like to ‘walk in another’s shoes’
- compare the experiences of others with their own, looking for commonalities and differences between their lives and seeking to understand these
- reflect on how intercultural encounters have affected their thoughts, feelings and actions
- accept that there are different ways of seeing the world and live with that diversity
- stand between cultures to facilitate understanding
- take responsibility for developing and improving relationships between people from different cultures in Australia and in the wider world
- contribute to and benefit from reconciliation between Indigenous and non-Indigenous Australians.
6. SEQUENCE AND SCOPE

Ref: separate document or download from http://www.australiancurriculum.edu.au/Science/Curriculum/F-10

School Sequence and Scope can also be found on the school server.

7. LEARNING AND TEACHING

At St Teresa’s School, we encourage teachers to use and inquiry pedagogical approach.

Three of the current staff are 2 day Academy trained science facilitators. Resources and information are located in the science planning folder in the teacher reference library. Appendix B shows a table including explanation of the 5E’s

Learning has always been one of the most natural of all human activities. It is fundamental to achievement and self-esteem in later life, and in partnership with parents is the core responsibility of our school staff and schools leadership.

Pedagogy is the art of teaching. Effective teachers use a variety of strategies to meet the diverse needs of the students and to improve learning outcomes. Good pedagogy engages students, helps students to link curriculum with their life experiences and contributes to positive classroom experiences for students and teachers.

Students currently inhabit a highly technological and information rich world that has experienced an information explosion. There are significant and rapid changes to society and changes in national and international economic structures. Young people increasingly live, socialise, create and work in a digital environment.

At St Teresa’s Science is taught for 1.5 hours per week and is integrated across a variety of Key Learning areas. Teachers plan units of work using the school based planning proformas that meet the requirements stipulated in the Diocesan “A Way Forward” document and align with the Diocesan Learning and Teaching Policy.

When planning Science, teachers are required to complete the following:

- Unit planner (Appendix A)
- Weekly planner
- Assessment task sheets (Appendix C)
At St Teresa’s School, when teaching Science teachers should:

- Provide 'hands on’ activities
- Provide real life contexts and inquiry based learning opportunities that are relevant to the context of St Teresa's students e.g. timber, farming, rural, school, playground...
- Provide explicit teaching of scientific concepts and skills
- Provide lessons that suit different learning styles (Multiple Intelligences)
- Provide opportunities for the development of scientific literacy skills
- Use digital resources to engage students and bring the worldviews into the classroom
- Use internet based resources to engage students and consolidate concepts (see ‘Websites to assist with the Teaching of Science’ space on “my classes”)
- Describe, interpret, instruct, explain and encourage participation
- Use open-ended investigative approaches

Teachers should:

- Investigate students’ prior knowledge through discussion or pre-assessment to inform planning
- Collect information about students at the beginning of the school year using a Student Interest Inventory to assist them with planning engaging and relevant units of work.

### 8. RESOURCES

**Diocesan Science Documents and Resources**

Teachers will find documents and resources for science produced by the CES on ‘My Classes’. These include Units planned by other teachers throughout the diocese, the sequence and scope science document, the National Curriculum Draft Document and the Science Curriculum Shaping Paper.

- School Resources and Documents
- ICT and classroom resources
- St Teresa’s Unit Planner pro-forma and suggested planning outline.
- Professional Readings
- Primary Connections Program in the teacher reference library
- 4 x Large Plastic Storage boxes containing equipment (as listed below)
- Books located in the teacher reference
- Measurement equipment located in the Mathematics Resource cupboard

The following table contains a list of resources in the above mentioned science resource boxes:
<table>
<thead>
<tr>
<th>Items</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Balls:</strong></td>
<td></td>
</tr>
<tr>
<td>basketball</td>
<td></td>
</tr>
<tr>
<td>basketball or netball</td>
<td></td>
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<tr>
<td>tennis ball (in sports’ room)</td>
<td></td>
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<tr>
<td>Batteries</td>
<td></td>
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<tr>
<td>Cardboard tube</td>
<td></td>
</tr>
<tr>
<td>Paper for labels (classroom)</td>
<td></td>
</tr>
<tr>
<td>Paper for name tags, labelled Sydney, Adelaide and Perth (classroom)</td>
<td></td>
</tr>
<tr>
<td>Chalk (classroom)</td>
<td></td>
</tr>
<tr>
<td>Compass, magnetic</td>
<td></td>
</tr>
<tr>
<td>Map of Australia (classroom or library)</td>
<td></td>
</tr>
<tr>
<td>Objects – different sized spherical objects</td>
<td></td>
</tr>
<tr>
<td>Paddle pop sticks</td>
<td></td>
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<tr>
<td>Plasticine</td>
<td></td>
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<tr>
<td>Tape measure</td>
<td></td>
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<tr>
<td>Self adhesive notes</td>
<td></td>
</tr>
<tr>
<td>Torches</td>
<td></td>
</tr>
<tr>
<td>Bucket (classroom)</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td></td>
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<tr>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Containers and cups (Maths resources)</td>
<td></td>
</tr>
<tr>
<td>Container, transparent</td>
<td></td>
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<tr>
<td>Containers, jugs, bottles, etc</td>
<td></td>
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<tr>
<td>Containers, small (plastic cup)</td>
<td></td>
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<tr>
<td>Cup, (paper, polystyrene)</td>
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<tr>
<td>Eye droppers</td>
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<tr>
<td>Food colouring</td>
<td></td>
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<tr>
<td>Gravel</td>
<td></td>
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<tr>
<td>Paper or cardboard (classroom)</td>
<td></td>
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<tr>
<td>Toothpicks</td>
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<tr>
<td>Water bottle, small</td>
<td></td>
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<tr>
<td>Balloons</td>
<td></td>
</tr>
<tr>
<td>bags</td>
<td></td>
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<tr>
<td>Funnel</td>
<td></td>
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<tr>
<td>Jug</td>
<td></td>
</tr>
<tr>
<td>Magnifying glass X 6</td>
<td></td>
</tr>
<tr>
<td>Masking tape</td>
<td></td>
</tr>
<tr>
<td>Measures – half cup, quarter cup, half teaspoon X 6</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td></td>
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<tr>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td>Paper towel</td>
<td></td>
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<tr>
<td>Plastic bags, resealable</td>
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<tr>
<td>Shallow containers</td>
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<tr>
<td>Sugar</td>
<td></td>
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<tr>
<td>Thermometer</td>
<td></td>
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<tr>
<td>Timer</td>
<td></td>
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<tr>
<td>Tongs X 6</td>
<td></td>
</tr>
<tr>
<td>Bucket (classroom)</td>
<td></td>
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<tr>
<td>Plastic tub (Prep)</td>
<td></td>
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<tr>
<td>Transparent cup</td>
<td></td>
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<tr>
<td>Transparent plastic container</td>
<td></td>
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<tr>
<td>Light objects</td>
<td></td>
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<tr>
<td>Heavy objects - metal tools, rock, nuts, bolts</td>
<td></td>
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<tr>
<td>Self adhesive notes</td>
<td></td>
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<tr>
<td>Paper towel</td>
<td></td>
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<tr>
<td>Plastic bags</td>
<td></td>
</tr>
<tr>
<td>Plasticine</td>
<td></td>
</tr>
<tr>
<td>Scissors (classroom)</td>
<td></td>
</tr>
</tbody>
</table>
Purchasing Resources

Classroom teachers have opportunity to purchase resources through the school. Teachers are encouraged to discuss resource needs with the other teachers privately and at staff meetings. St Teresa’s has an allocated resource budget which generally meets the needs of curriculum and which is continually assessed and monitored.

Discussion with principal and school administration officers about the ordering of books and other resources is generally all that is required. In the instance where teachers purchase agreed resources with their own money, invoices must be handed to the staff in charge of accounts in the office. New resources must be catalogued by the library staff and added to the school resource list when they arrive.

9. ASSESSMENT AND REPORTING

ASSESSMENT

Assessment is the process of gathering and interpreting information about student progress for a variety of purposes including:

- To direct future planning and teaching
- To inform teachers, students and parents about current understandings or misconceptions
- To identify strengths and weaknesses
- To create a ‘point in time’ snapshot of a student’s performance
- To create a record of a student’s learning
- To enable teachers to report

At St Teresa’s School planning for assessment is a vital part of the teaching process. Therefore:

- Teachers should plan their assessment for each term before they plan their lessons.
- Teachers must include a variety of assessment techniques (at least one investigative task per term) and include details about the use of these techniques e.g. approximate dates for assessment items, conditions for the assessment (individual work, pairs or groups) and marking rubrics. A rubric outline is included –Appendix D
- Assessment criteria included in rubrics should use descriptive and comparative words that enable teachers to make clear judgements about the standard of a student’s work
At St Teresa’s School, we believe that the following assessment techniques are appropriate for assessing student progress in the area of science:

- Observation
- Anecdotal records
- Student reflections/hypotheses
- Investigations
- Written tests
- Book work (setting out shows thinking)
- Rubrics (Appendix D)
- Oral presentations and explanations (Appendix C)
- Performance Tasks e.g. QCATs for science
- Peer assessments
- Model building
- Experimentation and reporting of findings.

Assessment will be recorded in the following ways:

- Observation checklists
- Anecdotal records
- Rubrics
- Tests
- Report card
- Photo or other digital evidence
- Student written records using pre selected scientific genre.

Record Keeping of Science Assessment

For record keeping purposes and accountability teachers need to file selected work samples - tests, 1 rubric/criteria sheet per term, annual performance task for science (such as QCAT task) where appropriate, student-written scientific texts, photos of constructions or experiments (process and presentation). These files are stored in filing cabinets in classrooms and are passed along when students progress through the years. When students leave the school at the end of Year 7 these files will be archived.

Teachers should also store photos or other digital evidence, class checklists and anecdotal records along with their planning.
Reporting

Reporting the progress of students to parents occurs on a formal basis in the following ways at St Teresa’s School:

- Per semester – Written CES format (Term 2 and 4)
- Term 1 and 3 – Oral Interview
- QCATS – internet upload as required
- Assessment rubric / criteria sheet on major assessment tasks (Appendix C & D)
- Parent invitation to oral presentations or displays of major assessment tasks (including technology)

The information provided in these reports should be constructive and should encourage parents and students to reflect on progress and areas of strength and weakness, and encourage students to set future goals for their learning.

Teachers are encouraged to communicate frequently on an informal basis with parents about concerns or to praise student achievements. This may be done through notes on homework, class notes, awards, informal discussions etc...

If teachers have serious concerns about a student’s progress in science, they should arrange a formal meeting with parents to discuss their concerns. They should also discuss these concerns with Learning Support staff. Included in this group of students would be gifted and talented, those needing support and those requiring amendments for individual learning programs.

Teachers should ensure that parents are kept up to date with what students are currently working on in science lessons. This may be done in a variety of ways e.g. sending home a term overview for science at the start of the term, including weekly snippets of information on homework sheets or through science updates on the ‘my classes’ class page. Parents may be invited to watch presentations in class, on parade and in the community.

Written and Oral Reports

Reporting the progress of students to parents occurs on a formal basis in the following ways at St Teresa’s School:

- Per semester – Written CES format (Term 2 and 4)
- Term 1 and 3 – Oral Interview
- QCATS – internet upload as required
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- Assessment rubric / criteria sheet on major assessment tasks (Appendix C & D)
- Parent invitation to oral presentations or displays of major assessment tasks (including technology)

### 10. EVALUATION

Evaluation occurs in three ways:

- Evaluation of planning by the teacher/learning area coordinator
- Evaluation of learning and teaching strategies/resources etc
- Evaluation of the school curriculum document to ensure it reflects current understandings and practices.

Evaluation is the process of making judgements about the effectiveness of curriculum documents, teaching programs, procedures and resources. Evaluation is an inherent part of our professional lives as teachers and as a school.

#### EVALUATION OF PLANNING BY THE TEACHER/LEARNING AREA COORDINATOR

Classroom science unit planning and weekly overviews will be discussed on a one to one basis between the principal and the class teacher. This communication may include the curriculum support person at St Teresa’s School. The aim of this contact is to unify planning expectations on a school level, ensure all scientific strands are covered consistently at every year level and that adequate resources are provided to enhance varied and engaging learning experiences at every stage. Usually a planning conference occurs twice a year, with new and inexperienced teachers receiving more frequent and detailed help as required. At St Teresa’s School we are very lucky to have a small and supportive staff, who communicate at meetings as well as informally around the lunch table.

#### EVALUATION OF LEARNING AND TEACHING STRATEGIES/RESOURCES ETC

This evaluation is done by teachers and is an on-going process. Teachers should record notes on their planning to show:

- Modifications to planning (differentiation)
- Reflections on teaching strategies, resources, student achievement etc…
- Completed work (date to show when completed) and unfinished work
- Teachers may also use student reflection and evaluation to help to determine the success of units of work.

Professional development for teachers in Primary Connections has been provided to some and the school has an ongoing commitment to provision of science professional development as required.
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Purchasing and use of resources is encouraged and individual assistance for targeted students is available through learning support and other funded intervention programs.

**EVALUATION OF THE SCHOOL CURRICULUM DOCUMENT TO ENSURE IT REFLECTS CURRENT UNDERSTANDINGS AND PRACTICES.**

Evaluation of St Teresa’s Science Curriculum Plan

St Teresa’s School endeavours to work collaboratively with the Tablelands Curriculum Cluster and CES staff at present and as LA curriculum documents evolve over the coming years. Decisions may be necessary as our science planning progresses. A school copy of the Sequence and Scope is also available on the school server.

This document will be formally reviewed in 2014.