Science Curriculum Document

The Science Curriculum document was last reviewed in 2003. It will be reviewed again in 2008. Areas requiring attention include separating Objectives from the Science strands. The Agreed Practice on Teaching and Learning also needs to be updated in line with more recent curriculum documentation updates.

The reporting section includes our new rubrics and some minor editing has been done on this document.

Contents

Context

The staff at St Thomas Aquinas have been using the 'Primary Investigations' program as the core document. However teachers felt that this program was too prescriptive and was not allowing them to teach units of work from which they felt the children would benefit. After discussion it was agreed that the school would trial a variety units of work from various Science resources in 2003. These units of work had to conform with the NSW K-6 outcomes. The Science curriculum would then be written and documented for term 4 2003 when it would be reviewed.

As a key resource the staff decided to use the Primary Science resource published by RIC Publications. This resource is aligned with the NSW Science curriculum. The staff has used units from this text as a basis for units of work across all stages. Each stage has developed eight units of work which they may decide to use over the next two years- odd and even cycle.

Future Development

The current Science Policy was reviewed and approved in November 2003. Future development will entail teachers using the school developed stage units within this document. Teachers may then choose to modify or develop other units provided that these units are in keeping with the NSW Stage Outcomes and Indicators which are included in this document. As the Science document is based on a two year cycle the document may be reviewed in two years time. The following year (2006) it will be ready to be the subject of an external curriculum review.

VISION STATEMENT

To encourage the growth of each person through friendship with Jesus.

MISSION STATEMENT

At St Thomas Aquinas we live out our Vision in four main ways: through Faith, People, Education and Innovation.

FAITH
- We live out our Gospel values in a Christ-centred community.
- We believe in an education in Catholic faith where all members of the Parish/School community lead by example.

PEOPLE
- We value the uniqueness of all members of our community and encourage them to share their gifts.
- We respond to the needs of others.
- We build compassionate and caring relationships.

EDUCATION
- We believe achievement has its own intrinsic rewards.
- We provide an exciting and challenging environment in which each individual is encouraged.
- We celebrate the joy of discovery and appreciate that mistakes and risk taking are steps to learning.
- We develop each person: intellectually, spiritually, emotionally, spiritually and socially in an atmosphere of love and respect.

INNOVATION
- We believe that our community will continue to grow and change and we must meet and welcome these challenges.
- We renew our mission through reflection and education.
- We search for new ways to proclaim the Gospel.

SCHOOL EXIT OUTCOMES

As a school community we will work towards children leaving St Thomas Aquinas with the following qualities that we believe are enhanced by involvement education in Science.

Spirituality
We want the children to strive to be optimistic, fair, just and truthful.
At St Thomas Aquinas School we strive to recognise the individual differences of students and accordingly provide them with learning experiences, which further develop their scientific and technological understanding and skills. We teach Science in an optimistic, just and fair manner, which allows the children to have hope in the future.

Character
We want children to grow in initiative, tolerance and confidence.
Providing children with work at an appropriate stage level will help children to develop into confident problem solvers. Thus, they will be able to understand their world more fully. They will learn that they can take actions that will have a positive outcome for their environment.

Thinking
We want the children to think critically, solve problems and reflect on their learning.
Science is concerned with finding out about the world in a systematic way. It provides opportunities for students to gain a better understanding of the world through the process of investigation. Because Science will play an increasingly important role in the future wellbeing of our world's peoples and their environment students need to be able to make informed, rational and responsible decisions.

Citizenship
We want the children to value themselves, their families, others and their history.
In Science the children will explore how human needs can be met through the designing and making process. As they grow in scientific knowledge and understanding, the children will be able to participate as responsible citizens in maintaining and improving the quality of their lives and those of others in our world.

Communication
We want children to listen effectively, use technology and develop interpersonal skills.
Through the use of Information and Communications Technologies the children will be taught to communicate, access, evaluate and present information. These skills will aid them in the problem solving process. In small groups, children are given opportunity to work cooperatively and improve their interpersonal skills.

RATIONALE

At St Thomas Aquinas we believe that through the study of Science our students will develop the skills, knowledge and understanding, values and attitudes that will enable them to become active participants in our dynamic society.

St Thomas Aquinas students will engage in learning experiences, which involve scientific content and processes. The curriculum content and teaching methodology is designed to encourage students to be active and flexible learners.

We believe that Science provides an opportunity for students to develop an appreciation of the wonder of God's creation.

Science promotes skills such as critical thinking, problem solving, reflection, analysis and discernment- all of which promote the search for truth and meaning. (Treasures New and Old p.24)

AIM

The aim of Science is to develop in students competence, confidence and responsibility in their interactions with Science leading to:
• An enriched view of themselves, society, the environment and the future and
• An enthusiasm for further learning of Science.

OBJECTIVES

Students will develop their knowledge and understanding of:
• Built Environments
• Information and Communication
• Living Things
• Physical Phenomena
• Products and Services
• Earth and its Surroundings
• The process of investigation that people use in order to develop reliable understanding of the natural and made environments
• The process of designing and making that people use in order to satisfy their wants and needs
• The technologies people select and use, and how these technologies affect other people, the environment and the future.

Built Environments

People create, construct, modify and adapt structures and spaces for a wide range of purposes. The environments they build are an important part of our communities and cultures.
The Built Environment strand is concerned with:
• Buildings and the spaces within and surrounding these buildings, e.g. homes, schools, community facilities and factories, parks and gardens
• Natural environments that have been modified to suit particular needs, e.g. land cleared for farming and altered waterways
• Transport systems, e.g. railways, roads, shipping ports and airports
• The people and organizations that change environments
• The effects of change on made and natural environments
• Services provided to communities, e.g. electricity, water, etc
• Aesthetic and functional qualities of built environments
• Systems used to control conditions in built environments
• Methods used to construct buildings and environments
• The variety of characteristics of refined and processed materials and how these affect their uses.

Information and Communications

Information and communications are fundamental to most human activity. They can be used to collect, store and organize data and so assist in solving problems.
The Information and Communications strand is concerned with:
• The nature of communications
• Methods of communicating between individuals, groups and communities, e.g. personal conversation, telephones, satellite link-ups

• Systems of information storage and transfer, e.g. databases, computer systems, videotape libraries, microfiche
• The people and organizations that produce, use, consume or are affected by information and communications technologies
• Structures and products that exist to access, promote and distribute information, e.g. magazines, television, films, computer networking, telecommunications
• Changes to information and communication technology over time.

Living Things

Living things interact with each other and affect their environments in complex ways. Understanding of people, other animals and plants are fundamental to a wide range of human activity.

The Living Things strand is concerned with:
• The similarities and differences between living things
• The way that living things interact with one another
• The processes that occur within living things
• The way living things adapt to their environments
• The human body as a complex system that needs to be understood and cared for
• The ways people use and manipulate other living things to address their own needs and wants
• How living things change over a lifetime
• How groups of living things change over long periods of time
• How natural environments are affected by technological activities
• The beneficial and detrimental effects of technology on living things
• How environments provide for the needs of living things.[1]

Physical Phenomena

Energy can exist in various forms and can be used to meet specific needs. A considerable proportion of human activity depends on understanding of physical phenomena
related to energy, space and time.

The Physical Phenomena strand is concerned with:
• Relationships between time, space and movement
• How physical phenomena are used by people to address particular needs
• Forces and their effects
• Sources of energy
• Light and some of its characteristics
• Sound and some of its characteristics
• Heat and some of its characteristics
• Electricity and some of its characteristics
• Magnetism and some of its characteristics
• Availability of energy resources and the uses people make of the various forms of energy, e.g. solar and wind
• Electrical circuits and their uses
• the systems that exist and the environmental cost of supplying different forms of energy.

[1] Source: adapted from NSW Science and Technology Syllabus K-6

Products and Services
People make, distribute, use and consume an enormous quantity and variety of goods and commodities. A considerable proportion of human activity is aimed at providing these products and services.
The Products and Services strand is concerned with:
• The processes people use to produce goods, commodities and services
• Products people make, process or grow
• The organisations people develop to produce goods or products
• Means of delivery and distribution
• Systems designed to provide particular services, e.g. transport, health, education
• The effect of various products and services on people and organizations
• The management of materials and resources including waste disposal and recycling
• The means by which products are marketed
• The materials and resources used to produce goods and commodities
• The way in which the characteristics of naturally occurring materials affect their use
• How production technologies have changed over time
• How materials are shaped, joined, formed and finished
• The environmental consequences of production and consumption.

Earth and its Surroundings
The Earth is part of a changing system. It is also itself a changing system. In order to preserve life on Earth, there is a growing need to develop understanding of the Earth's characteristics and how people interact with their environments.
The Earth and its Surroundings strand is
concerned with:
• The solar system, planets, Earth, moon and stars
• Aspects of the physical environment, eg the Earth's crust, its oceans and atmosphere
• Natural changes that occur, such as soil erosion, volcanic eruption, climatic changes and movement of water
• The passing of time and the natural events that make people aware of this passing, e.g. daily cycles, lunar cycles and seasons
• The variety and characteristics of naturally occurring materials
• The methods people use to obtain and process materials
• The methods people use to manage natural resources
• Limitations to resources available on Earth
• Renewable resources.

Learning processes (skills)
Science education requires that students learn about and engage in:
• The process of investigating
• The process of designing and making
• The use of technology.

Investigating
All people engage in the activity of investigating. It is an activity that capitalizes on and develops curiosity. It is a core process whereby students develop understanding about natural and made environments. Children will develop investigative skills by:

• Exploring and discovering phenomena and events
• Proposing explanations
• Predicting outcomes
• Testing and modifying understanding
• Explaining and applying understanding

Designing and making
Designing is an activity in which all people engage. It is a core process through which students try to identify needs and propose practical means by which these needs can be addressed. Children will develop design skills by:
• Identifying needs and wants and defining a design task
• Generating and selecting ideas to best meet the design task objectives
• Using resources to assemble or construct products, systems or environments

Using Technology
• Understand the nature of the task
• Develop the necessary skills to use the technology
• Evaluate the possible benefits of technology in relation to the personal, social and economic effects of its use

Values and attitudes
Students will engage in learning experiences that will enable them to develop positive and informed values and attitudes:
• Towards themselves
• Towards others
• Towards science.

Toward Themselves
VA 1 Demonstrates confidence in their own ability and a willingness to make decisions when investigating, making and/or using technology
VA 4 Gain satisfaction from their efforts to investigate, design, make and use technology

Toward Others
VA 2 Exhibits curiosity and responsiveness to science ideas and evidence
VA 5 Works cooperatively with others in groups on scientific tasks and challenges

Toward Science
VA 3 Initiates scientific and Technological tasks and challenges and perseveres with them to their completion
VA 6 Shows informed commitment to improving the quality of society and the environment through Science activities
VA 7 Appreciates contributions made by individuals, groups, cultures and communities to scientific understanding
VA 8 Appreciates the significance of Australian scientific expertise across gender and cultural groups.

Source: adapted from Science and Technology K-6 Syllabus (1991)

BROAD OUTCOMES

Early Stage 1
Students who have achieved Early Stage 1 show a growing awareness of, and interest in, the natural and made environment. They demonstrate confidence in proposing ideas for designs they develop through play and modeling. They demonstrate curiosity about artifacts, events, phenomena, places and living things around them.

Early Stage 1 students will:
• Use play to explore ideas
• Manipulate materials and trial solutions
• Develop and begin to refine their understanding of environments, materials, equipment and other resources through trial and error
• Ask questions, suggest ideas, propose their own explanations and are able to report verbally and graphically on their actions and observations.
• Observe features of their immediate environment
• Explore the properties of a range of common materials
• Identify and group living and non-living things according to some common characteristics.
• Explore and identify the needs of people and other living things.
• Recognize the use of some forms of energy and their ideas about energy are beginning to develop as they experience energy in different contexts.
• Generate their own ideas, using make-believe,
• Recognize that information can come from a variety of sources, including other people and from different media, e.g. books and videos.
• They demonstrate an awareness of a range of uses for computer-based technology as well as showing an emerging confidence in their ability to explore and use computer-based technologies with assistance, to create text, images and play games.
• Develop ideas through the use and manipulation of concrete materials as a means of progressing towards abstract thought.

Stage 1
Students who have achieved Stage 1 are developing an awareness of the wider world and are applying their scientific and technological understanding to new and different situations. They are starting to develop the social skills required to investigate, design and make products and services.

On completing Stage 1 students will:
• Appreciate living things and their environments.
• Recognise that people create products, services and environments to meet their own needs.
• Understand some of the forms of energy.
• Interpret information and make predictions based on their own observations.
• Accept that the result of a test may be different from what was originally expected.

Source: adapted from NSW Science and Technology Syllabus K-6

• Begin to see that an investigation is a series of orderly steps. [2]
• Use their senses to identify similarities and differences.
• Draw plans for a design and can explain some of the features and materials to be used.
• Write labels and simple explanations when creating images
• Recognize and discuss with others, some of the strengths and limitations of what they have done and identify some changes that could be made to improve plans or models, e.g. appearance.
• Make comparisons about what they like and dislike about familiar products, systems or environments.
• Develop an awareness of a range of media and information products.
• Use computer technology to start, open files or applications, save and shut down.
• Use computer-based technologies where appropriate for a given task.
• Identify the different forms of technology in their immediate environments and explain how they help us.
• Safely use, maintain and store equipment such as scissors, magnifying glasses, computers and disks.

Stage 2

Students who have achieved stage 2 are able to initiate their own investigations. They ask perceptive questions and respond to design tasks in innovative ways. They identify ways of improving their own scientific and technological activities by considering such issues as how well something works, its appearance and how it might effect the environment.

On completing Stage 2 students will:
• Develop the capacity to ask questions to clarify understanding.
• predict outcomes by proposing explanations and testing to see if their predicted outcomes eventuate.
• Form understanding about 'fair testing' that takes into account the need for consistent conditions except for one variable, in order to ensure accurate results.
• Suggest modifications to improve their initial proposals, including the selection of different solutions to arrive at a suitable outcome.
• Explore the properties, capabilities and working characteristics of both natural and manufactured materials and components.
• Recognize that materials are varied and have different properties that affect their use.
• Select, maintain and safely use classroom tools and equipment, hardware and software and justify their selection for particular tasks.
• Develop plans that show some consideration of the types and quantities of materials required and an awareness of the need for accuracy in a plan for production purposes.
• Identify and describe some aspects of the structure and function of living things and some of the ways living things interact.
• identify and describe some of the interactions of the Earth with other parts of the solar system.
• Devise systems that inform or utilize their understanding of some forms of energy.
• Demonstrate a greater understanding of and control over a design process.

[2] Source: adapted from NSW Science and Technology Syllabus K-6

• Recognize the importance of evaluation throughout a design cycle.
• Recognize the function of some hardware and software and are able to select and use these to meet the requirements of a task.
• Discuss the possibilities and limitations of using a range of technology including computer-based technology.

Stage 3
Students who have achieved stage 3 are able to undertake investigations independently in order to satisfy their curiosity. They initiate investigations, select and use appropriate language and demonstrate skills critically.

During and on the completion of stage three students will:
• Undertake investigations independently in order to satisfy their own curiosity.
• Select and use appropriate language, structures and media and demonstrate skills in
• Critically examining and communicating scientific and technological ideas and issues.
• Relate their scientific and technological understanding to new tasks or different situations.
• Research and investigate to identify phenomena and processes that have influenced Earth over time.
• Be are aware of the skills and processes involved in designing and making, investigating and using technology.
• Manage the design process including aspects of time management, design constraints and needs of the target audience.
• Use two- and three-dimensional drawings and models
• Observe the form and detail of objects carefully in order to produce accurate drawings from different views and they reflect on their drawings, sketches or computer models.
• Acquire information from a variety of sources and experiment with new techniques and skills as technologies change.
• Use data, diagrams and a range of tools and equipment.
• Recognize that computer-based technologies have a wide range of applications in society and can identify and describe some of the effects of such technologies on individuals and communities.
• Confidently and competently use a range of computer-based hardware and applications.
• Identify alternative uses and can be creative in adapting available software to the requirements of a task.
• Reflect on the methods used and positive and negative results of technological and scientific activity both throughout their own projects and in personal, local and global contexts.

Source: adapted from NSW Science and Technology Syllabus K-6

ACROSS CURRICULUM PERSPECTIVES

Catholic Ethos

At St Thomas Aquinas we believe that 'Catholic Ethos' is an integral part of our school community and the curriculum.
Science contributes to the religious aims of St Thomas Aquinas because it fosters skills such as: reflection, critical thinking, problem solving, analysis and discernment – all of which promote the search for truth and meaning.
(Treasures New and Old p.24) Through the integration of Gospel values such as: justice, respect for others and a responsibility to care for our environment into the teaching of Science, children see that Science has an important role to play in their lives. Children will gain a global understanding as "Australian society is being transformed in response to increasing globalisation and accelerated technological change" (Treasures New and Old p 33) Science assists children in being able to begin to critically examine their place in this changing world.

Aboriginal and Torres Strait Islander Education

At St Thomas Aquinas we recognise and value the contributions made by the Aboriginal and Torres Strait Islander cultures to Australia's identity. We believe that all students must have the opportunity to experience their cultural and natural heritage. This will enhance our sense of identity and pride in our cultures and ensure a greater knowledge and understanding of our cultural heritage. Through the Science curriculum children at St Thomas Aquinas will be provided with opportunities to gain accurate knowledge about Aboriginal and Torres Straight Islander societies. It is important that all Australian students develop an awareness of the effects of the European invasion and settlement on Aboriginal and Torres Strait Islander people.

Australian Education

At St Thomas Aquinas we recognise and value Australia's rich heritage. Through Science we explore Australian achievements in local, national and international arenas. We encourage an understanding of Australian history, society, economic and political structures. We recognise the importance of our students experiencing the diversity of Australian life as it has developed.

Environment Education

At St Thomas Aquinas we believe that each and every person has a role to play in protecting and sustaining the environment. Science is a key learning area in providing children with the knowledge, awareness, attitudes, values and skills that will assist them in protecting and sustaining their environment. Through various units the children will come to understand the impact of people on environments and the inter-related nature of ecosystems.

Gender Equity

Gender equity is the right of all students to have equal access to learning and resources. At St Thomas Aquinas we model skills and behaviours that will assist students in developing equal and respectful relationships with each other - regardless of gender.
In Science the children will be provided with opportunities to learn:
• About the voices, viewpoints and achievements of women and men

• How gender biases have at times excluded women or men from cultural activities.
• That Science has no gender bias, all children are encouraged to participate fully.

Information Access
At St Thomas Aquinas there is opportunity for all children to gain equal access to information. Internet access in each classroom ensures all children have the opportunity to access up to date information. By extending collaborative work practices between teachers and teacher librarians the children's information targeting and retrieval skills will increase.

Literacy
Science offers all students the chance to develop the scientific literacy that they need to play a full part in a modern democratic society where science plays a key role in shaping our lives - as active and informed citizens.
Through the use of the literacy skills of reading and writing, speaking and listening children will complete such tasks as:

Problem solving	Clarifying and articulating
Synthesising and gathering data	Communicating

Multicultural Education
At St Thomas Aquinas we value the richness of cultural and ethnic diversity, which exists, within our community. In Science staff and students are provided with opportunities to explore the traditions, beliefs and practices of other cultures. Where possible we use student's own experiences as a starting point in our investigations of other cultures and we ensure that all content values the backgrounds of all students.

Equality of Education (including all groups of students)
This perspective emphasises the ability of children with a wide range of individual differences to participate and succeed in many aspects of learning.
Children in Science are supported in their learning by participating in activities that cater for their educational needs and styles of learning. Where research work is given the scope of questions will allow for children of varying degrees of ability to be able to respond at their own level. Inclusive approaches which value student diversity and build upon self-esteem will be used wherever possible. Attention will be paid to the needs and learning outcomes of students with special needs, ESL students and of gifted and talented students.

Work Education
At St Thomas Aquinas the children will explore the roles played by people in different societies and how Science affects a variety occupations. The children will investigate the connection between Science and the development of knowledge and skills for and about the world of work.

Global Perspectives
The children at St Thomas Aquinas explore the role of Science in global systems and Australia's position in the world. They examine Australian contributions to the world of Science. They look at rights and responsibilities of users and producers of goods and services worldwide and what is required of a responsible 'global citizen.'

Social Justice

Through the integration the Gospel value of justice the children at St Thomas Aquinas will be encouraged (at an appropriate level) to critically examine the way in which Science is used in our world. Key questions which the children may address include: What is the purpose of Science? Is Science used in a way that offers hope and freedom from oppression for the disadvantaged? Is science practiced ethically? Does the 'digital divide' really exist? What is my accessibility to scientific knowledge?

Futures Perspectives

The future of our planet in large part will be determined by the way in which we use Science and the Technologies which are available to us. We encourage the children's understanding of, and concern for, stewardship of the natural environment, and the knowledge and skills to contribute to ecologically sustainable development. We promote confident, creative and productive users of new technologies, particularly information and communication technologies.

NSW K-6 Science Outcomes

Strands and substrands	Early Stage 1	Stage 1	Stage 2	Stage 3
Content				
Built Environments	BEES1.1 Explores and identifies ways in which built environments suit their users.	BES1.1 Creates, modifies or models built environments to suit the needs of users.	BES2.1 Creates, models and evaluates built environments, reflecting consideration of functional and aesthetic factors.	BES3.1 Creates and evaluates built environments, demonstrating consideration of sustainability and aesthetic, cultural, safety and functional issues.
Information and Communication	ICES1.2 Recognises and uses various means of communication.	ICS1.2 Creates a range of information products and communicates using a variety of media.	ICS2.2 Creates and evaluates information products demonstrating an understanding of the needs of particular audiences.	ICS3.2 Creates and evaluates information products and processes, demonstrating consideration of the type of media, form, audience and ethical issues.
Living Things	LTES1.3 Identifies ways in which living things are different and have different needs.	LTS1.3 Identifies and describes ways in which living things grow and change.	LTS2.3 Identifies and describes the structure and function of living things and ways in which living things interact with other living things and their environment.	LTS3.3 Identifies, describes and evaluates the interactions between living things and their effects on the environment.
Physical Phenomena	PPES1.4 Explores and identifies ways some forms of energy are used in their daily lives.	PPS1.4 Identifies and describes different ways some forms of energy are used in the community.	PPS2.4 Identifies various forms and sources of energy and devises systems that use energy.	PPS3.4 Identifies and applies processes involved in manipulating, using and changing the form of energy.
Products and Services	PSES1.5 Recognises the relationship between everyday products and people's needs.	PSS1.5 Grows, makes or processes some products using a range of techniques and materials.	PSS2.5 Creates and evaluates products and services, considering aesthetic and functional factors.	PSS3.5 Creates and evaluates products and services, demonstrating consideration of sustainability, aesthetic, cultural, safety and functional issues.
Earth and Its Surroundings	ESES1.6 Explores and identifies ways the environment influences their daily lives.	ESS1.6 Identifies and describes ways in which people and other living things depend upon the earth and its environments.	ESS2.6 Identifies some of the features of the solar system and describes interactions that affect conditions on earth.	ESS3.6 Recognises that the earth is the source of most materials and resources, and describes phenomena and processes, both natural and human, that form and change the earth over time.

NSW K-6 Science Outcomes

Strands and substrands	Early Stage 1	Stage 1	Stage 2	Stage 3
Processes				
Investigating	INVES1.7 Investigates their surroundings by observing, questioning, exploring and reporting.	INVS1.7 Conducts guided investigations by observing, questioning, predicting, collecting and recording data, and suggesting possible explanations.	INVS2.7 Conducts investigations by observing, questioning, predicting, testing, collecting, recording and analysing data, and drawing conclusions.	INVS3.7 Conducts their own investigations and makes judgements based on the results of observing, questioning, planning, predicting, testing, collecting, recording and analysing data, and drawing conclusions.
Designing and Making	DMES1.8 Generates own ideas and designs through trial and error, play, modelling and making.	DMS1.8 Develops and implements own design ideas in response to an investigation of needs and wants.	DMS2.8 Develops, implements and evaluates ideas using drawings, models and prototypes at appropriate stages of the design process.	DMS3.8 Develops and resolves a design task by planning, implementing managing and evaluating design processes.
Using Technology	UTES1.9 Identifies and uses a limited range of equipment, computer-based technology, materials and other resources when undertaking exploration and production.	UTS1.9 Selects and uses a range of equipment, computer-based technology, materials and other resources to undertake an investigation or design task.	UTS2.9 Selects and uses a range of equipment, computer-based technology, materials and other resources with developing skill to enhance investigation and design tasks.	UTS3.9 Evaluates, selects and uses a range of equipment, computer-based technology, materials and other resources to meet the requirements and constraints of investigation and design tasks.

SCIENCE (odd and even years)
Scope and Sequence

Early Stage 1 All topics based on units from **Primary Science Book A**	About Me (LT) (IC)	Weather (ES) (PP)	Sorting Materials (PS) (BE)	On the Move (PP) (LT)
	Plants and animals (LT)	Time (ES)	Water (PP)	Sound (PP) (IC)
Stage 1 Topics based on units from **Primary Science Books B & C**	Science Magic (PS) (BE) -Book B	Night and Day (ES) -Book B	Growing Plants (LT) -Book B	Fossils (ES) -Book C
	My Environment (ES) (IC) -Book B	Insects (LT) -Book C	Colour (PP) -Book B	Push and Pull (PP) -Book B
Stage 2 Topics based on units from **Primary Science Books D & E**	Flight (PP) -Book D	Magnets (ES) -Book D	Changes to the Local Environment (IC) (ES) (BE) - Book D	What do you Eat? (PS) (LT) -Book E
	Investigating Sound (LT) (PP) -Book E	Life Cycles (BE) (IC) (LT) -Book D	Structures (BE) (PP) -Book D	Investigating Weather (BE) (ES) (LT) -Book D
Stage 3 Topics based on units from **Primary Science Books F & G**	A Restless Earth (ES) -Book G	Energy and its Uses. (PP) -Book G	Conservation (ES) -Book F	Kitchen Science (BE) (LT) (PS) (PP) -Book G
	Flowering Plants (LT) -Book F	Simple Machines (PP) Or Light and Animation (PP) -Book F	Ecosystems (LT) (ES) -Book G	Space (ES) (IC) -Book F

AGREED PRACTICE TEACHING AND LEARNING

Beliefs
At St Thomas Aquinas we believe:

- Children's learning progress is enhanced when they are valued and accepted as a part of a safe learning community.
- Children learn individually and through interaction with others.
- Each child learns at his/her own pace.
- Learning is a lifelong process.
- Children learn through a variety of teaching styles within a child centred, inclusive classroom environment.
- Children are encouraged to experiment in their attempts to solve problems.
- Mistakes are viewed as a natural part of the learning process.
- Learning is a 'cumulative process' whereby previous knowledge and skills are built upon.
- Children need time to reflect on their learnings.
- Children need time to revise and consolidate and put their learnings into practice.
- Children should be involved in decision making in regard to their learning.
- Teaching and learning activities should take into account the varied backgrounds of the learners.
- Children should use technology to enhance learning.

Practices
In Science we encourage the following teaching practices:

- Involving parents in the education of their children
- Co-operative learning
- Choice of content which is appropriate to the child's age and stage of development
- Inclusive curriculum
- Providing a forum in which children can express their thoughts and ideas
- Clearly stated expectations
- Affirmation of the children
- 'Hands on' activities
- Real life, meaningful experiences
- Catering for children with special needs
- Bloom's taxonomy

  Knowledge — Synthesis
  Comprehension — Evaluation
  Application
  Analysis
- Gardner's Multiple intelligences

  Logical mathematical — Musical/Rhythmic
  Interpersonal — Verbal/Linguistic

- Whole school focuses (when appropriate)
- Involving community experts to visit the children
- Displays of the children's learning
- Excursions
- Integration of ICT
- Constructivist learning whereby the learner has responsibility for his/her learning (relative to age)
- Gender equity
- Use of simple equipment and recycled materials- when possible.

ASSESSMENT

At St Thomas Aquinas we believe that we should pursue assessment that is meaningful, child centred and task related. We believe that assessment can be both summative and formative. We believe that assessment is an integral part of the learning process. The assessment undertaken by the teachers may inform teaching practice or may provide information for teachers, children and parents on the attainment of outcomes.

The principles below underpin effective assessment in Science.

- A distinction needs to be made between knowledge and understandings, skills, values and attitudes. Teachers need to make judgments about what students know rather than their level of enthusiasm.
- Assessment is based on achievement of specific outcomes and indicators.
- The assessment process should be clear in the mind of the child.
- Judgments about achievement should not be based entirely on one piece of evidence.

Choosing Assessment Tasks.

Area of Assessment	Examples of Tasks
Knowledge and understandings	Quizzes, multiple choice, true/false tests, matching questions and answers, labelling diagrams, written and spoken texts.
Skills Acquiring information Using an inquiry process	 Data collection, graphing, concept maps, timelines, assignments and projects. Research projects, problem solving, critical dialogue (student –teacher, student-student)
Values and attitudes	Actions, spoken and visual texts.

REPORTING

At St Thomas Aquinas written reports are sent home to parents during Term 2 and again towards the end of Term 4. Reports are in the A-E format of reporting and students are assessed according to these criteria.

Formal parent teacher interviews are held following the Term 2 report and before the Term 4 report. Informal interviews are held whenever requested by teachers or parents.

Science Assessment Rubric Kindergarten

Score	Summary / Description	Descriptors
Experiencing Difficulty- Is yet to display knowledge, understanding and application of the content, processes and skills in this area.	• Understanding not yet evident	Unable to communicate ideas and knowledge
Developing - Is beginning to display knowledge, understanding and application of the content, processes and skills in this area.	• Developing some understanding of central ideas, concepts and skills	Communicates ideas and knowledge in limited situations
Competent Displays a thorough knowledge, understanding and application of the content, processes and skills in this area.	• Understands central ideas, concepts and skills	Communicates effectively in a variety of situations

Science Assessment Rubric Years 1-6

Score	*Summary / Description*	*Descriptors*
A The student has extensive knowledge and understanding of the context and can readily apply this knowledge. In addition the student has achieved a very high level of competence in the processes and skills and can apply these skills to new situations	-Fully accomplishes the task, but uses methods and/or makes interpretations significantly beyond those specified for this level -Independently applies higher order thinking to new situations -Outstanding Achievement	Observing, hypothesizing, investigating, testing, reporting, retesting and reasoning significantly beyond those specified for this level.
B The student has thorough knowledge and understanding of the content and high level of competence in the processes and skills. In addition the student is able to apply this knowledge and these skills to most situations.	-Task accomplished with high level of competence -Comprehension and understanding displayed at a high level -Is beginning to apply higher order thinking strategies to most situations -High Achievement	Clear communication and demonstration of procedures, observations and results
C The student has a sound knowledge and understanding of the main areas of content and has achieved a limited level of competence in the processes and skills.	-Task accomplished -Central ideas demonstrated and understood -Good understanding of relevant knowledge, concepts and skills -Develops and uses some problem solving strategies and applies these to new situations -Sound Achievement	Some demonstration and communication of procedures, observations and results.
D The student has a basic knowledge and understanding of the content and has a limited level of competence in the process and skills.	-Attempts the task -Makes some progress -Partial but limited grasp of the central ideas reveals gaps in knowledge, conceptual understanding and/or relevant skills -Beginning to attempt and apply problem solving strategies -Basic Achievement	Beginning communication and demonstration of procedures, observations and results.
E The student has an elementary knowledge and understanding in few areas of content and has achieved very limited competence in some of the processes and skills.	-Little progress or understanding evident -No task attempted -Shows no attempt to develop or apply simple problem solving strategies -Limited Achievement	Limited demonstration and communication of procedures, observations and results.

Sources

NSW K-6 Syllabus
NSW K-6 Support Material

NSW Board of Studies

Book A – Early Stage 1
Books B and C – Stage 1
Books D and E – Stage 2
Books F and G – Stage 3
Primary Science RIC Publications Pty Ltd
Greenwood Western Australia
Published 2002

EQUIPMENT INVENTORY

Description	Quantity
Rubber bands	3 packets
Cork mats	3
Chopping boards	6
Electric jug	1
Iron	2
Spring balance scales	15
mirrors	7
Mirror holders	7
prism	10
droppers	50
microscopes	5
magnifiers	30
chopsticks	30
torch	2
burner	1
Fish tanks	2
Paint roller holders	2
corks	Bucketful
Plastic bottles	Box
Measuring flasks	Several different types
pulleys	12
Battery holder	1
Bulldog clips	boxful
Iron filings	Container full
Paper	
Thumbtacks	Carton full

EQUIPMENT INVENTORY cont.

Mini circuit boards	15
Plastic hose	1
Tree trunk cross section	1
Grass seeds	
G-clamps	2
Weights	10
Plastic Human skeleton	1
Large fluoroescent light	1
Measuring buckets	5
Magnifying glasses	20
Watering cans	5
sandpaper	10 sheets
Alligator clip ends	3 packets
Lego and meccano sets	2
Bar magnets	12 sets
Compasses (directional)	5
Ball bearings	Consumable items such as those below can be ordered at the beginning of each term from school catalogues. (or collected)
Velcro strips	
Light bulbs	
Batteries AA AAA	
Cardboard	
Safety pins	
Pins	
Nuts	
Bolts	
String	
Aluminium foil	
Candles	
Baking soda	
Vinegar	
Balloons	
Rain gauge	
Steel wool	
toothpicks	
Paddlepop sticks	
Matches	
Match sticks	
Rubber hosing	

EVALUATION PROFORMA

Teachers will complete the following proforma upon the completion of a unit of work and leave the form in their program. These evaluation sheets will then inform future planning.

Unit Title_____

Stage Level _____

Things that worked well

_____
_____
_____
_____

Things that need changing

_____
_____
_____
_____

Resources. Were the resources adequate? _____

Suggestions for next time

_____
_____
_____