Year Level Description: Maths

The proficiency strands understanding, fluency, problem-solving and reasoning are an integral part of mathematics content across the three content strands: number and algebra, measurement and geometry, and statistics and probability. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics. The achievement standards reflect the content and encompass the proficiencies.

Year Level Description: Science

The science inquiry skills and science as a human endeavour strands are described across a two-year band. In their planning, schools and teachers refer to the expectations outlined in the achievement standard and also to the content of the science understanding strand for the relevant year level to ensure that these two strands are addressed over the two-year period. The three strands of the curriculum are interrelated and their content is taught in an integrated way. The order and detail in which the content descriptions are organised into teaching and learning programs are decisions to be made by the teacher.

Incorporating the key ideas of science

Over Years 3 to 6, students develop their understanding of a range of systems operating at different time and geographic scales. In Year 5, students are introduced to cause and effect relationships through an exploration of adaptations of living things and how this links to form and function. They explore observable phenomena associated with light and begin to appreciate that phenomena have sets of characteristic behaviours. They broaden their classification of matter to include gases and begin to see how matter structures the world around them. Students consider Earth as a component within a solar system and use models for investigating systems at astronomical scales. Students begin to identify stable and dynamic aspects of systems, and learn how to look for patterns and relationships between components of systems. They develop explanations for the patterns they observe.

Year Level Description: Design Technologies

Learning in Design and Technologies builds on the range of concepts, skills and processes developed in previous years. In Year 5, students have opportunities to learn about technologies in society through different technology contexts as they create solutions in at least one of the following technologies contexts: Engineering principles and systems; Food and fibre production; Food specialisations; and Materials and technologies specialisations. Students are provided with opportunities to produce products and develop an understanding that designs for services and environments meet community needs. Students have opportunities to explore technologies that incorporate materials, components, and equipment used in the home and wider community. They continue to consider society, cultural needs and environmental factors, paying attention to sustainable practices. Students question why and for whom technologies are developed.

Students begin to engage with ideas beyond the familiar, exploring how the people working in a range of technologies contexts contribute to society. They are provided with opportunities to explore innovative design solutions that build on their own design capabilities. Using a range of techniques, students explore how to represent objects and ideas in a variety of forms, such as thumbnail sketches, models, drawings, diagrams and storyboards to communicate the development of designed solutions.

Personal and Social Capability Skills:

Self-awareness

explain how the appropriateness of emotional responses influences behaviour

describe the influence that personal qualities and strengths have on their learning outcomes

identify preferred learning styles and work habits

monitor their progress, seeking and responding to feedback from teachers to assist them in consolidating strengths, addressing weaknesses and fulfilling their potential

Self-management

explain the influence of emotions on behaviour, learning and relationships

analyse factors that influence ability to self-regulate and develop strategies and apply models to monitor own behaviour and set realistic learning goals

assess the value of working independently, and taking initiative to do so where appropriate

contribute to groups and teams, suggesting improvements in methods used for group investigations and projects

factors that influence decision making and consider the usefulness of these in making their own decisions

identify causes and effects of conflict, and practise different strategies to diffuse or resolve conflict situations

Information and Communication Technology Skills

Applying social and ethical protocols and practices when using ICT

identify the legal obligations regarding the ownership and use of digital products and apply some referencing conventions independently apply strategies for determining and protecting the security of digital information and assess the risks associated with online environments

identify the risks to identity, privacy and emotional safety for themselves when using ICT and apply generally accepted social protocols when sharing information in online environments, taking into account different social and cultural contexts

explain the main uses of ICT at school, home and in the local community, and recognise its potential positive and negative impacts on their lives

use a range of ICT to identify and represent patterns in sets of information and to pose questions to guide searching for, or generating, further information

Investigating with ICT

use a range of ICT to identify and represent patterns in sets of information and to pose questions to guide searching for, or generating, further information

locate, retrieve or generate information using search engines and simple search functions and classify information in meaningful ways to assess the suitability of data or information using a range of appropriate given criteria

Creating with ICT

use ICT effectively to record ideas, represent thinking and plan solutions

independently or collaboratively create and modify digital solutions, creative outputs or data representation/ transformation for particular audiences and purposes

Communicating with ICT

select and use appropriate ICT tools safely to share and exchange information and to safely collaborate with others to understand that particular forms of computer mediated communications and tools are suited to synchronous or asynchronous and one-to-one or group communications

Managing and operating ICT

select from, and safely operate, a range of devices to undertake specific tasks and use basic troubleshooting procedures to solve routine malfunctions

identify, compare and classify basic ICT system components

manage and maintain data on different storage mediums – locally and on networks

Critical and Creative Thinking:

Inquiring – identifying, exploring and organising information and ideas

pose questions to clarify and interpret information and probe for causes and consequences

identify and clarify relevant information and prioritise ideas

analyse, condense and combine relevant information from multiple sources

Generating ideas, possibilities and actions

combine ideas in a variety of ways and from a range of sources to create new possibilities

identify situations where current approaches do not work, challenge existing ideas and generate alternative solutions

assess and test options to identify the most effective solution and put ideas into action

Reflecting on thinking and processes

reflect on assumptions made, consider reasonable criticism and adjust their thinking if necessary

identify and justify the thinking behind choices they have made

apply knowledge gained from one context to another unrelated context

identify new meaning

Analysing, synthesising and evaluating reasoning and procedures

assess whether there is adequate reasoning and evidence to justify a claim, conclusion or outcome

scrutinise ideas or concepts, test conclusions and modify actions when designing a course of action

evaluate the effectiveness of ideas, products, performances, methods and courses of action against given criteria

STEM: Planning for Integration

Year 5

Teacher: __________

Room: __________

Term 1: __________

Term 2: __________

Term 3: __________

Term 4: __________
**Mathematics**

**Number and Algebra**
- Identify and describe factors and multiples of whole numbers and use them to solve problems
- Use estimation and rounding to check the reasonableness of answers to calculations
- Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies
- Solve problems involving division by a one digit number, including those that result in a remainder
- Use efficient mental and written strategies and apply appropriate digital technologies to solve problems
- Compare and order common unit fractions and locate and represent them on a number line
- Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator
- Recognise that the place value system can be extended beyond hundreds
- Compare, order and represent decimals
- Create simple financial plans
- Describe, continue and create patterns with fractions, decimals and whole numbers resulting from addition and subtraction
- Find unknown quantities in number sentences involving multiplication and division and identify equivalent number sentences involving multiplication and division

**Measurement and Geometry**
- Choose appropriate units of measurement for length, area, volume, capacity and mass
- Calculate perimeter and area of rectangles using familiar metric units
- Choose appropriate units of measurement for length, area, volume, capacity and mass
- Compare 12- and 24-hour time systems and convert between them
- Connect three-dimensional objects with their nets and other two-dimensional representations
- Use a grid reference system to describe locations
- Describe routes using landmarks and directional language
- Describe translations, reflections and rotations of two-dimensional shapes
- Identify line and rotational symmetries
- Apply the enlargement transformation to familiar two-dimensional shapes and explore the properties of the resulting image compared with the original
- Estimate, measure and compare angles using degrees
- Construct angles using a protractor

**Statistics and Probability**
- List outcomes of chance experiments involving equally likely outcomes and represent probabilities of those outcomes using fractions
- Recognise that probabilities range from 0 to 1
- Pose questions and collect categorical or numerical data by observation or survey
- Construct displays, including column graphs, dot plots and tables appropriate for data type, with and without the use of digital technologies
- Describe and interpret different data sets in context

**Science**

**Science Understanding**
- Living things have structural features and adaptations that help them to survive in their environment
- Solids, liquids and gases have different observable properties and behave in different ways
- The Earth is part of a system of planets orbiting around a star (the sun)
- Light from a source forms shadows and can be absorbed, reflected and refracted

**Science as a Human Endeavour**
- Science involves testing predictions by gathering data and using evidence to develop explanations of phenomena and reflects historical and cultural contributions
- Scientific knowledge is used to solve problems and inform personal and community decisions

**Science Inquiry Skills**
- With guidance, pose clarifying questions and make predictions about scientific investigations
- Identify, plan and apply the elements of scientific investigations to answer questions and solve problems using equipment and materials safely and identifying potential risks
- Decide variables to be changed and measured in fair tests, and observe measure and record data with accuracy using digital technologies as appropriate
- Compare data with predictions and use as evidence in developing explanations
- Reflect on and suggest improvements to scientific investigations
- Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multimodal texts

**Design & Technologies**

**Knowledge and Understanding**
- How people address competing considerations when designing products, services and environments
- Forces can control movement, sound or light in a product or system
- People in design and technologies occupations aim to increase efficiency of production systems, or consumer satisfaction of food and fibre products
- Food safety and hygiene practices
- Characteristics and properties of a range of materials and components, and the suitability and safe practice of their use

**Processes and Production Skills**
- Define a problem, and set of sequenced steps, with users making a decision to create a solution for a given task
- Develop and communicate alternative solutions, and follow design ideas, using annotated diagrams, storyboards and appropriate technical terms
- Select, and apply, safe procedures when using components and equipment to make solutions
- Develop negotiated criteria to evaluate and justify design processes and solutions
- Work collaboratively to safely develop and publish basic plans, including sequencing of steps

**Digital Technologies**

**Knowledge and Understanding**
- Digital systems have components with basic functions that may connect together to form networks which transmit data
- Data is represented using codes

**Processes and Production Skills**
- Collect, store and present different types of data for a specific purpose using software
- Design solutions to a user interface for a digital system
- Design, follow and represent diagrammatically, a simple sequence of steps (algorithm), involving branching (decisions) and iteration (repetition)
- Implement and use simple programming environments that include branching (decisions) and iteration
- Create and communicate information, including online collaborative projects, using agreed social, ethical and technical protocols (codes of conduct)
- Define a problem, and set of sequenced steps, with users making a decision to create a solution for a given task
- Develop and communicate alternative solutions and follow design ideas, using annotated diagrams, storyboards and appropriate technical terms
- Select, and apply safe, procedures when using components and equipment to make solutions
- Develop negotiated criteria to evaluate and justify design processes and solutions
- Work collaboratively to safely develop and publish basic plans, including sequencing of steps

**Science: Achievement Standard**
- By the end of Year 5, students classify substances according to their observable properties and behaviours. They explain everyday phenomena associated with the transfer of light. They describe the key features of our solar system. They analyse how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people’s lives, help us solve problems and how science knowledge develops from many people’s contributions. Students follow instructions to pose questions for investigation and predict the effect of changing variables when planning an investigation. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct tables and graphs to organise data and identify patterns in the data. They compare patterns in their data with predictions when suggesting explanations. They describe ways to improve the fairness of their investigations, and communicate their ideas and findings using multimodal texts.

**Mathematics: Achievement Standard**
- By the end of Year 5, students solve simple problems involving the four operations using a range of strategies. They check the reasonableness of answers using estimation and rounding. Students identify and describe factors and multiples. They identify and explain strategies for finding unknown quantities in number sentences involving the four operations. They explain plans for simple budgets. Students connect three-dimensional objects with their two-dimensional representations. They describe transformations of two-dimensional shapes and identify line and rotational symmetry. Students interpret different data sets.
- Students order decimals and unit fractions and locate them on number lines. They add and subtract fractions with the same denominator. Students continue patterns by adding or subtracting fractions and decimals. They use appropriate units of measurement for length, area, volume, capacity and mass, and calculate perimeter and area of rectangles. They convert between 12- and 24-hour time. Students use a grid reference system to locate landmarks. They measure and construct different angles.
- Students list outcomes of chance experiments with equally likely outcomes and assign probabilities between 0 and 1. Students pose questions to gather data, and construct data displays appropriate for the data.

**Technologies: Achievement Standard**
- To be developed in 2015 using (assessment) work sample evidence to ‘set’ standards through paired comparisons.