Year Level Description: Maths

The proficiency strands are addressed over the year level. Students develop 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 of 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 explore how changes can be classified in different ways. They learn about transfer and transformations of electricity, and continue to develop an understanding of energy flows through systems. They link their experiences of electric circuits as a system at one scale to generate electricity from a variety of sources as another scale and begin to see links between these systems. They develop a view of Earth as a dynamic system, in which changes in one aspect of the system impact on other aspects; similarly, they see that the growth and survival of living things are dependent on matter and energy flows within a larger system. Students begin to see the role of variables in measuring changes and the value of accuracy in these measurements. They learn how to look for patterns and use these to identify and explain relationships by drawing on evidence.

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 of 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 explore how changes can be classified in different ways. They learn about transfer and transformations of electricity, and continue to develop an understanding of energy flows through systems. They link their experiences of electric circuits as a system at one scale to generate electricity from a variety of sources as another scale and begin to see links between these systems. They develop a view of Earth as a dynamic system, in which changes in one aspect of the system impact on other aspects; similarly, they see that the growth and survival of living things are dependent on matter and energy flows within a larger system. Students begin to see the role of variables in measuring changes and the value of accuracy in these measurements. They learn how to look for patterns and use these to identify and explain relationships by drawing on evidence.

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 6, 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 the opportunity to begin to critically examine technologies, including materials, systems, components, tools and equipment that are used regularly in the home and wider community. They explore and begin to consider ethical points of view, social impact and environmentally sustainable factors when developing design solutions. Students examine why and for whom technologies are developed.

Students have opportunities to engage with ideas beyond the familiar, exploring how people working in a range of technology contexts contribute to society. They continue to build on design capabilities through broadening their own design ideas used in solutions. Students have opportunities to explore trends and data to predict what the future will be like, and suggest design decisions that contribute positively to preferred futures.

Using technologies to suit the purpose, students explore how to represent objects and ideas in a variety of forms to communicate the development of designed solutions. They use a range of preferred techniques to illustrate how products function.

Personal and Social Capability Skills:

Self-awareness
explain how the appropriateness of emotional responses influences behaviour

Social awareness
explain how means of communication differ within and between communities and identify the role these play in helping or hindering understanding of others

Social management
identify factors that influence effective communication in a variety of situations

Critical and Creative Thinking:

Inquiring – identifying, exploring and organising information and ideas

In Year 6, students further develop understanding and skills in computational thinking such as identifying similarities in different problems and describing smaller components of complex problems. They will have opportunities to create a range of solutions, such as quizzes and interactive stories and animations that involves more than one branching solution (choice of options).

Students consolidate their understanding of the role individual components of digital systems play in the processing and representation of data. They acquire, validate, interpret, test and manage various types of data, and begin to explain the concept of data states in digital systems and how data are transferred between systems.

Students learn to further develop abstractions by identifying common elements across similar problems and systems and make connections between models and the real-world systems they represent.

When creating solutions, students further refine their skills to identify and use appropriate data and requirements. They increase the sophistication of their algorithms by identifying repetition. They learn to incorporate repeat instructions or structures when implementing their solutions through visual programming environments, such as reading user input until an answer is guessed correctly in a quiz.

Students critique design solutions and examine the sustainability of their own, and existing, information systems.

Students develop strategies to communicate information and ideas using agreed ethical protocols, taking into account the safety aspects of working in digital environments.

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
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 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

STEM: Planning for Integration

Year 6

Term 1: Room:
Teacher:

Term 2:

Term 3:

Term 4:
Mathematics

Number and Algebra
- Identify and describe properties of prime, composite, square and triangular numbers
- Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers
- Investigate everyday situations that use integers. Locate and represent these numbers on a number line
- Compare fractions with related denominators and locate and represent them on a number line
- Solve problems involving addition and subtraction of fractions with the same or related denominators
- Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies
- Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers
- Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals, with and without digital technologies
- Multiply and divide decimals by powers of 10
- Make connections between equivalent fractions, decimals and percentages
- Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies
- Continue and create sequences involving whole numbers, fractions and decimals. Describe the rule used to create the sequence

Measurement and Geometry
- Connect decimal representations to the metric system
- Convert between common metric units of length, mass and capacity
- Solve problems involving the comparison of lengths and areas using appropriate units
- Connect volume and capacity and their units of measurement
- Interpret and use timetables
- Construct simple prisms and pyramids
- Investigate combinations of translations, reflections and rotations, with and without the use of digital technologies
- Introduce the Cartesian coordinate system using all four quadrants
- Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles

Statistics and Probability
- Describe probabilities using fractions, decimals and percentages
- Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies
- Compare observed frequencies across experiments with expected frequencies
- Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables
- Interpret secondary data presented in digital media and elsewhere

Science

Science Understanding
- The growth and survival of living things are affected by physical conditions of their environment
- Changes to materials can be reversible or irreversible
- Sudden geological changes and extreme weather events can affect Earth’s surface
- Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources

Science as a Human Endeavour
- Science involves testing predictions by gathering data and evidence to develop explanations of events and 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
- Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data 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 multi-modal texts

Mathematics: Achievement Standard

By the end of Year 6, students connect the properties of prime, composite, square and triangular numbers. They use the integers in everyday contexts. They solve problems involving all four operations with whole numbers. Students connect fractions, decimals and percentages as different representations of the same number. They solve problems involving the addition and subtraction of related fractions. Students use the properties of odd and even numbers in mental calculations and make connections between equivalent fractions, decimals and percentages. They describe the use of integers in everyday contexts. They solve problems involving all four operations with whole numbers. Students compare observed and expected frequencies. They interpret and compare a variety of data displays including those displays for two categorical variables. They interpret secondary data displayed in the media.

Students locate fractions and integers on a number line. They calculate a simple fraction of a quantity. They add, subtract and multiply decimals and divide decimals where the result is rational. Students calculate common percentage discounts on sale items. They write correct number sentences using brackets and order of operations. Students locate an ordered pair in any one of the four quadrants on the Cartesian plane. They construct simple prisms and pyramids. Students describe probabilities using simple fractions, decimals and

Science: Achievement Standard

By the end of Year 6, students compare and classify different types of observable changes to materials. They analyse requirements for the transfer of electricity and describe how energy can be transformed from one form to another when generating electricity. They explain how natural events cause rapid change to Earth’s surface. They describe and predict the effect of environmental changes on individual living things. Students explain how scientific knowledge helps us to solve problems and inform decisions and identify historical and cultural contributions.

Students follow procedures to conduct investigations into simple cause-and-effect relationships. They identify variables to be changed and measured and describe potential safety risks when planning methods. They collect, organise and interpret their data, identifying where improvements to their methods or research could improve the data. They describe and analyse relationships in data using appropriate representations and construct multimodal texts.

Digital Technologies

Knowledge and Understanding
- Digital technologies have components with basic functions and interactions that may be connected together to form networks which transmit different types of data
- Whole numbers are used to represent data in a digital system

Processes and Production Skills
- Collect, sort, interpret and visually present different types of data using software to manipulate data for a range of purposes
- Design, modify, follow and represent both diagrammatically, and in written text, simple algorithms (sequence of steps) involving branching (decisions) and iteration (repetition)
- Implement and use simple visual programming environments that include branching (decisions), iteration (repetition) and user input
- Manage the creation and communication of information, including online collaborative projects, using agreed social, ethical and technical protocols

Technologies: Achievement Standard

To be developed in 2015 using (assessment) work sample evidence to ‘set’ standards through paired comparisons.

Design & Technologies

Knowledge and Understanding
- How people address competing considerations, including sustainability when designing products, services and environments for current and future use
- Electrical energy and forces can control movement, sound or light in a product or system
- Past performance, and current and future needs are considered when designing sustainable food and fibre systems for products
- Principles of food preparation for healthy eating

Characteristics, properties and safe practice of a range of material systems, tools and equipment; and evaluate the suitability of their use

Processes and Production Skills
- Define a problem, and a set of sequenced steps, with users making decisions to create a solution for a given task
- Identify available resources
- Design, modify, follow and represent both diagrammatically, and in written text, alternative solutions using a range of techniques, appropriate technical terms and technology Select, and apply safe procedures when using a variety of components and equipment to make solutions
- Develop evaluative criteria to evaluate and justify design processes and solutions
- Work collaboratively, considering resources and safety, to plan, publish and manage projects, including sequenced steps

Design, modify, follow and represent both diagrammatically, and in written text, simple algorithms (sequence of steps) involving branching (decisions) and iteration (repetition)

Implement and use simple visual programming environments that include branching (decisions), iteration (repetition) and user input

Design, modify, follow and represent both diagrammatically, and in written text, alternative solutions using a range of techniques, appropriate technical terms and technology Select, and apply safe procedures when using a variety of components and equipment to make solutions

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