AUSTRALIAN ACARA CONTENT OUTCOMES: SCIENCE & MATHEMATICS

LevelOutcome Description

Year 3 & 4

- identify sources of heat energy and examine how temperature changes when heat energy is transferred from one object to another AC9S3U03
- investigate the observable properties of solids and liquids and how adding or removing heat energy leads to a change of state AC9S3U04
- examine the properties of natural and made materials including fibres, metals, glass and plastics and consider how these properties influence their use AC9S4U04
- examine how people use data to develop scientific explanations AC9S3H01, AC9S4H01
- consider how people use scientific explanations to meet a need or solve a problem AC9S3H02, AC9S4H02
- pose questions to explore observed patterns and relationships and make predictions based on observations AC9S3I01, AC9S4I01

compare findings with those of others, consider if investigations were fair, identify questions for further investigation and draw conclusions AC9S3I05, AC9S4I05

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AUSTRALIAN ACARA CONTENT OUTCOMES: SCIENCE & MATHEMATICS

LevelOutcome Description

Year 5 & 6

- explain observable properties of solids, liquids and gases by modelling the motion and arrangement of particles AC9S5U04
- compare reversible changes, including dissolving and changes of state, and irreversible changes, including cooking and rusting that produce new substances AC9S6U04
- investigate how scientific knowledge is used by individuals and communities to identify problems, consider responses and make decisions AC9S5H02, AC9S6H02
- pose investigable questions to identify patterns and test relationships and make reasoned predictions AC9S5I01, AC9S6I01
- compare methods and findings with those of others, recognise possible sources of error, pose questions for further investigation and select evidence to draw reasoned conclusions AC9S5I05, AC9S6I05 secondary data or information AC9S9I07 AC9S10I07

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AUSTRALIAN ACARA CONTENT OUTCOMES: SCIENCE & MATHEMATICS

LevelOutcome Description

Year 7 & 8

- use a particle model to describe differences between pure substances and mixtures and apply understanding of properties of substances to separate mixtures AC9S7U06
- compare physical and chemical changes and identify indicators of energy change in chemical reactions AC9S8U07
- explain how new evidence or different perspectives can lead to changes in scientific knowledge AC9S7H01 AC9S8H01
- examine how proposed scientific responses to contemporary issues may impact on society and explore ethical, environmental, social and economic considerations AC9S7H03 AC9S8H03
- develop investigable questions, reasoned predictions and hypotheses to explore scientific models, identify patterns and test relationships AC9S7I01 AC9S8I01
- analyse data and information to describe patterns, trends and relationships and identify anomalies AC9S7I05 AC9S8I05
- construct evidence-based arguments to support conclusions or evaluate claims and consider any ethical issues and cultural protocols associated with using or citing secondary data or information AC9S7I07 AC9S8I07 AC9S9I07 AC9S10I07

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AUSTRALIAN ACARA CONTENT OUTCOMES: SCIENCE & MATHEMATICS

LevelOutcome Description

Year 9 & 10

- explain how scientific knowledge is validated and refined, including the role of publication and peer review AC9S9H01 AC9S10H01
- Investigate how advances in technologies enable advances in science, and how science has contributed to developments in technologies and engineering AC9S9H02 AC9S10H02
- develop investigable questions, reasoned predictions and hypotheses to test relationships and develop explanatory models AC9S9I01 AC9S10I01
- analyse and connect a variety of data and information to identify and explain patterns, trends, relationships and anomalies AC9S9I05 AC9S10I05
- construct arguments based on analysis of a variety of evidence to support conclusions or evaluate claims, and consider any ethical issues and cultural protocols associated with accessing, using or citing secondary data or information AC9S9I07 AC9S10I07

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SCIENCE AT HOME

APPLIED SCIENCE

NSW SCIENCE & TECHNOLOGY SYLLABUS CONTENT

CodeOutcome Description

ST2-7MW-T

investigates the suitability of natural and processed materials for a range of purposes

ST3-6MW-S

explains the effect of heat on the properties and behaviour of materials

ST3-7MW-T

explains how the properties of materials determines their use for a range of purposes

NSW SCIENCE AND TECHNOLOGY K-6 SYLLABUS (IMPLEMENTATION FROM 2027)

StageOutcome Description & Content

Stage 2

ST2-PQU-01: poses questions to create fair tests that investigate the effects of energy on living things and physical systems

ST2-DAT-01: uses and interprets data to describe patterns and relationships

Stage 3

ST3-SCI-01: uses evidence to explain how scientific knowledge can be used to develop sustainable practices

- Recognise that in a fair test, an independent variable is changed, a dependent variable is measured, and controlled variables remain the same
- Pose questions to determine whether substances dissolve in water by identifying variables and conducting and evaluating fair tests

ST3-PQU-01: poses questions to identify variables and conducts fair tests to gather data

ST3-DAT-01: interprets data to support explanations and arguments

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NSW SCIENCE 7–10 SYLLABUS (IMPLEMENTATION FROM 2026)

StageOutcome Description & Content

Stage 4

A student:

identifies questions and makes predictions to guide scientific investigations SC4-WS-02

- Identify questions and problems that can be investigated scientifically
- Make predictions based on scientific knowledge and observations

explains how the properties of substances enable separation in a range of techniques SC4-SOL-01

- Compare the properties of dilute, concentrated, saturated and supersaturated solutions

explains how uses of elements and compounds are influenced by scientific understanding and discoveries relating to their properties SC4-PRT-01

- Identify some common elements in everyday objects
- Conduct a series of investigations to identify and compare the physical properties of metals, non-metals and metal

explains how energy causes geological and chemical change SC4-CHG-01

- Undertake experiments to identify the indicators of physical and chemical changes
- Describe the initial and final changes that are observed in a chemical reaction, including writing a word equation to represent a chemical reaction.

Stage 5

asks questions or makes predictions using observations SCLS-WS-02

- Ask questions about familiar objects and events based on observations
- Make predictions based on observations

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VIC CURRICULUM F–10 VERSION 2.0

LevelOutcome Description

Levels 3 & 4

- solids, liquids and gases have observable properties; adding or removing heat energy leads to a change of state between solids, liquids and gases. VC2S4U04
- the properties of natural and made materials, including fibres, metals, glass and plastics, influence their use and re-use. VC2S4U05
- scientific investigations to answer questions or test predictions can be planned and conducted using provided scaffolds, including identifying the attributes of fair tests, and considering the safe use of materials and equipment. VC2S4I02
- scientific knowledge, skills and data can be used by people to explain how they will meet a need or solve a problem. VC2S4H02

Levels 5 & 6

- changes to substances may be reversible, in which case the substance may be recovered, or irreversible, in which case new substances are formed; for most substances a change of state or dissolving in water is reversible, while irreversible changes include cooking and rusting. VC2S6U04
- repeatable scientific investigations to answer questions can be planned and conducted, including, as appropriate, deciding the variables to be changed, measured and controlled in fair tests, considering potential risks, planning for the safe and ethical use of equipment and materials, and obtaining permissions for investigations conducted on Country and Place or in protected areas. VC2S6I02
- scientific knowledge, skills and data can be used by individuals and communities to identify problems, consider responses and make decisions. VC2S6H02

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VIC CURRICULUM F–10 VERSION 2.0

LevelOutcome Description

Levels 7 & 8

- matter can be classified as pure substances such as elements and compounds or impure substances such as mixtures (including solutions), and can be modelled using the particle model; mixtures may have a uniform (homogeneous) or non-uniform (heterogeneous) composition and can be separated based on the properties of their components using techniques including filtration, decantation, evaporation, crystallisation, magnetic separation, distillation and chromatography. VC2S8U06
- physical changes can be distinguished from chemical changes; a chemical change can be identified by a colour change, a temperature change, the production of a gas (including laboratory preparation and testing of oxygen, carbon dioxide and hydrogen gases) or the formation of a precipitate. VC2S8U08
- investigable questions, reasoned predictions and hypotheses can be developed in guiding investigations to identify patterns, test relationships and analyse and evaluate scientific models. VC2S8I01
- scientific methods, conclusions and claims can be analysed to identify assumptions, possible sources of error, conflicting evidence and unanswered questions. VC2S8I06
- evidence-based arguments can be constructed to support conclusions or evaluate claims, including consideration of ethical issues and protocols associated with using or citing secondary data or information. VC2S8I07dary data or information. VC2S10I07

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VIC CURRICULUM F–10 VERSION 2.0

LevelOutcome Description

Levels 9 & 10

- chemical reactions include synthesis, decomposition and displacement reactions and can be classified as exothermic or endothermic; reaction rates are affected by factors including temperature, concentration, surface area of solid reactants, and catalysts. VC2S10U09
- investigable questions, reasoned predictions and hypotheses can be used in guiding investigations to test and develop explanatory models and relationships. VC2S10I01
- the validity and reproducibility of investigation methods and the validity of conclusions and claims can be evaluated, including by identifying assumptions, conflicting evidence, biases that may influence observations and conclusions, sources of error and areas of uncertainty. VC2S10I06
- arguments based on a variety of evidence can be constructed to support conclusions or evaluate claims, including consideration of any ethical issues and cultural protocols associated with accessing, using or citing secondary data or information. VC2S10I07

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INTERNATIONAL BACCALAUREATE (IB) FRAMEWORK: PYP & MYP

ProgrammeFramework Links & Objective Descriptions

Primary Years Programme (PYP)

Transdisciplinary Themes & Scientific Strands:

- How the world works: Inquiry into the natural world and its laws; the interaction between the physical and biological worlds; how humans use their understanding of scientific principles.
- Materials (Strand): Inquiry into the properties, behaviours and uses of materials (natural and manufactured); the physical and chemical changes materials undergo.
- Energy (Strand): Inquiry into the different types of energy; its origins, storage, and transfer; and how energy is used by people.
- Inquiry Skills: Observe carefully; pose questions; make predictions; conduct fair tests; record data; interpret findings and communicate explanations.

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INTERNATIONAL BACCALAUREATE (IB) FRAMEWORK: PYP & MYP

ProgrammeFramework Links & Objective Descriptions

Middle Years Programme (MYP)

Key Concepts & Assessment Objectives:

- Key Concepts: Change, Relationships, Systems (e.g., investigating chemical changes as shifts in a system).
- Related Concepts (Chemistry): Properties, Models, Form, Patterns, Transformation.
- Objective A: Knowing and understanding – Explain scientific knowledge; apply understanding to solve problems in familiar and unfamiliar situations.
- Objective B: Inquiring and designing – Explain a problem or question; formulate a testable hypothesis and explain it using scientific reasoning; design scientific investigations.
- Objective C: Processing and evaluating – Present and process data; interpret data and explain results; evaluate the validity of a hypothesis; evaluate methods and suggest improvements.
- Objective D: Reflecting on the impacts of science – Explain the ways in which science is applied and used to address a specific problem or issue; discuss and evaluate the implications of the use of science (ethical, social, environmental).

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CAMBRIDGE INTERNATIONAL SCIENCE STANDARDS

Programme/StageLearning Objectives

Cambridge Primary (Stages 3-6)

States of Matter & Materials:

- Describe the sub-division of matter into particles (using the particle model) and explain how this can be used to describe the properties of solids, liquids and gases. 6Ps.01
- Describe how boiling and evaporation are different. 6Ps.03
- Describe the difference between a reversible change and an irreversible change and identify some examples of each. 6Cp.01
- Explain that some changes, including burning and rusting, result in the formation of new materials and this type of change is usually irreversible. 5Cp.02

Scientific Enquiry (Thinking and Working Scientifically):

- Identify variables that should be taken into account when planning a fair test. 4TWsp.01
- Make a prediction based on scientific knowledge and understanding. 5TWsp.03
- Choose equipment and describe how to use it to make measurements. 6TWsc.03

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CAMBRIDGE INTERNATIONAL SCIENCE STANDARDS

Programme/StageLearning Objectives

Cambridge Lower Secondary (Stages 7-9)

Chemical & Physical Changes:

- Use the particle model to explain the properties of solids, liquids and gases, and to describe the changes of state (melting, freezing, boiling, evaporation, condensation, sublimation and deposition). 7Ps.01
- Describe the differences between elements, compounds and mixtures, including identifying examples of each. 8Cp.01
- Understand that a chemical reaction involves the rearrangement of atoms to form new substances. 9Cp.01
- Explain how a range of factors (including temperature, concentration and surface area) affect the rate of a chemical reaction. 9Cp.07

Scientific Enquiry:

- Explain how new evidence or different perspectives can lead to changes in scientific knowledge and understanding. 7TWsp.01
- Identify and evaluate the potential for human error in investigations. 8TWsc.05
- Describe a variety of ways to process and represent data. 9TWsc.01

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