Science and technology K-6 sample scope and sequence

## Inquiry and focus questions – whole school

### Term 1, odd year – materials: change of state

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| Outcomes | Working scientificallySTe-1WS-S – observes, questions and collects data to communicate ideasMaterial worldSTe-4MW-ST – identifies that objects are made of materials that have observable properties | Working scientificallyST1-1WS-S – observes, questions and collects data to compare and communicate ideasMaterial worldST1-6MW-S – identifies that materials can be changed or combined  | Working scientificallyST2-2WS-S – questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representationsMaterial worldST2-6MW-S – describes how adding or removing heat causes a change of state | Working scientificallyST3-2WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusionsMaterial worldST3-6MW-S – explains the effect of heat on the properties and behaviour of materials |
| What are some properties of materials and how can we change them? | * observe and describe some properties of a range of materials
 | * investigate how materials can be changed by bending, twisting and stretching
* investigate how different materials can be combined
 | * identify solids, liquids and gases as states of matter
* recognise that a change of state can be caused by adding or removing heat
* describes examples of changes of state in everyday life
* predict and observe the effects of adding or removing heat on a variety of solids and/or liquids
 | * investigate and compare the properties of solids, liquids and gases
* explore that when materials are combined the result is either a mixture or a new substance
* identify that mixtures can be separated using different techniques
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### Term 2, odd year – living things

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| Outcomes | Working scientificallySTe-1WS-S – observes, questions and collects data to communicate ideasLiving worldSTe-3LW-ST – explores the characteristics, needs and uses of living things | Working scientificallyST1-1WS-S – observes, questions and collects data to compare and communicate ideasLiving worldST1-4LW-S – describes observable features of living things and their environments | Working scientificallyST2-1WS-S – questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representationsLiving worldST2-4LW-S – compares features and characteristics of living and non-living things | Working scientificallyST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusionsLiving worldST3-4LW-Sexamines how the environment affects the growth, survival |
| What are some features of living things? | * participate in guided investigations to identify living things and the external features of plants and animals in the local environment
 | * describe the external features of a variety of living things
* identify and group plants and animals using their external features
 | * collect data and identify patterns to group living things according to their external features, and distinguish them from non-living things
 | * describe the structural and/or behavioural features of some native Australian animals and plants and why they are considered to be adaptations
 |
| What can we learn about living things and their environments? | * communicate findings of observations of living things in their environment
 | * identify that living things live in different places that suit their needs
 | * describe how living things depend on each other and the environment to survive
 | * plan and conduct a fair test to show the conditions needed for a particular plant or animal to grow and survive in its environment
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| How can living things change? | * communicate findings of observations of living things in their environment
 | * record the changes in growth of a common plant or animal, using uniform informal units and appropriate technologies
 | * conduct an investigation into the life cycle of plants and/or animals
 | * describe how changing physical conditions in the environment affect the growth and survival of living things
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### Term 3, odd year – sky, land and space

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| Outcomes | Working scientifically STe-1WS-S – observes, questions and collects data to communicate ideasEarth and space STe-6ES-S – identifies how daily and seasonal changes in the environment affect humans and other living things Digital technologies STe-7DI-T – identifies digital systems and explores how instructions are used to control digital devices | Working scientifically ST1-1WS-S – observes, questions and collects data to compare and communicate ideasEarth and space ST1-10ES-S – recognises observable changes occurring in the sky and on the land and identifies Earth’s resources Digital technologies ST1-11DI-T – identifies the components of digital systems and explores how data is represented | Working scientifically ST2-1WS-S – questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representationsEarth and space ST2-10ES-S – investigates regular changes caused by interactions between the Earth and the Sun, and changes to the Earth’s surface Digital technologies ST2-11DI-T – describes how digital systems represent and transmit data | Working scientifically ST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusionsEarth and space ST3-10ES-S – explains regular events in the solar system and geological events on the Earth’s surface Digital technologies ST3-11DI-T – explains how digital systems represent data, connect together to form networks and transmit data |
| What’s in the sky? | * identify daily and seasonal changes that occur in our environment, such as day and night, and changes in the weather
 | * record the observable changes that occur in the sky and on the land
 | * investigate how the Earth’s rotation on its axis causes regular changes including night and day
 | * identify that Earth is part of a system of planets orbiting around a star (the Sun)
* compare the key features of the planets of our solar system
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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| How do we respond to changes in the sky and space? | * explore how living things respond to regular changes in their environment
 | * identify how seasonal changes in our daily lives affect living things
 | * investigate how changes in the environment are used by Aboriginal and Torres Strait Islander Peoples to develop seasonal calendars
 | * research and communicate how Aboriginal and/or Torres Strait Islander Peoples use observations of the night sky to inform decisions about resources and significant cultural events
 |
| How are digital technologies used to record and communicate information about the sky and space? | * explore how people use digital systems to communicate
 | * identify a variety of uses for digital systems
* identify how data is represented as pictures, symbols and diagrams
* collect, explore and sort data, and use digital systems to present the data creatively
 | * explore how digital systems transmit different types of data
* investigate digital and information systems, and explore how they meet personal, school or community needs
* recognise that numbers, text, images, sounds, animations and videos are all forms of data when stored or viewed using a digital system
 | * explore how the main components of digital systems connect together to form networks that transmit data
* identify and explain how existing information systems meet the needs of present and future communities
* use software to interpret and visualise data
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### Term 4, odd year – forces

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| Outcomes | Working scientifically STe-1WS-S – observes, questions and collects data to communicate ideasDesign and production STe-2DP-T – develops solutions to an identified needPhysical world STe-5PW-ST – observes the way objects move and relates changes in motion to push and pull forces | Working scientifically ST1-1WS-S – observes, questions and collects data to compare and communicate ideasDesign and production ST1-2DP-T – uses materials, tools and equipment to develop solutions for a need or opportunityPhysical world ST1-9PW-ST – investigates how forces and energy are used in products | Working scientifically ST2-1WS-S – questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representationsDesign and production ST2-2DP-T – selects and uses materials, tools and equipment to develop solutions for a need or opportunityPhysical world ST2-9PW-ST – describes how contact and non-contact forces affect an object’s motion | Working scientifically ST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusionsDesign and production ST3-2DP-T – plans and uses materials, tools and equipment to develop solutions for a need or opportunityPhysical world ST3-9PW-ST – investigates the effects of increasing or decreasing the strength of a specific contact or non-contact force |
| What are forces and how do they make things move? | * observe the way a variety of familiar objects move, e.g. sliding, rolling, bouncing
* observe the effects of push and pull forces on familiar objects
 | * revise Early Stage 1 content
 | * identify that both pushes and pulls can be classified as contact and non-contact forces
* observe how contact and non-contact forces cause changes in the motion of objects
 | * explore and describe some common contact or noncontact forces
* perform a scientific investigation to explore the effects of changing the strength of a single contact or non-contact force
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| How are forces used in products or systems? | * preview Stage 1 content
 | * explore how technologies use forces to create movement in products
 | * investigate how forces and materials interact in a product or system to perform a function
 | * revise Stage 2 content
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### Term 1, even year – energy

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| Outcomes | Working scientifically STe-1WS-S – observes, questions and collects data to communicate ideasDesign and productionSTe-2DP-T – develops solutions to an identified needPhysical world STe-5PW-ST – observes the way objects move and relates changes in motion to push and pull forces Digital technologies STe-7DI-T – identifies digital systems and explores how instructions are used to control digital devices | Working scientifically ST1-1WS-S – observes, questions and collects data to compare and communicate ideasDesign and production ST1-2DP-T – uses materials, tools and equipment to develop solutions for a need or opportunityPhysical world ST1-8PW-S – describes common forms of energy and explores some characteristics of sound energy Digital technologies ST1-11DI-T – identifies the components of digital systems and explores how data is represented | Working scientifically ST2-1WS-S – questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representationsDesign and production ST2-2DP-T – selects and uses materials, tools and equipment to develop solutions for a need or opportunityPhysical world ST2-8PW-ST – describes the characteristics and effects of common forms of energy, such as light and heat Digital technologies ST2-11DI-T – describes how digital systems represent and transmit data | Working scientifically ST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusionsDesign and production ST2-2DP-T – plans and uses materials, tools and equipment to develop solutions for a need or opportunityPhysical world ST3-8PW-ST – explains how energy is transformed from one form to another Digital technologies ST3-11DI-T – explains how digital systems represent data, connect together to form networks and transmit data |
| What is energy and how does it make things happen? | observe the way a variety of familiar objects move | identify sound, light, heat, electricity and movement as forms of energyexplore sound, light and heat from various sources, using the senses | investigate the behaviour of lightdescribe the effects of heat energyexplore ways that heat can be transferred due to conduction | identify different types of energy transformationsinvestigate how electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources |

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| How is energy used in products and systems? | * preview Stage 1
 | * design and develop a product that uses one or more forms of energy to create change
 | * revise Stage 1, preview Stage 3
 | * investigate how electrical energy can control movement, sound, or light in a product or system
* design, test and evaluate a product or system that involves an energy transformation to meet an identified need using electrical energy
 |
| How is energy used to make things happen in digital technologies? | * explore familiar digital devices
 | * identify hardware and software components of digital systems
* identify a variety of uses for digital systems
 | * identify and explore a range of digital systems and peripheral devices
* explore how digital systems transmit different types of data
 | * investigate internal and external components of digital systems that perform functions
* explore how the main components of digital systems connect together to form networks that transmit data
* describe how data can be transmitted between two digital components
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### Term 2, even year – food and fibre

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| Outcomes | Design and production STe-2DP-T – develops solutions to an identified needLiving world STe-3LW-ST – explores the characteristics, needs and uses of living things | Design and production ST1-2DP-T – uses materials, tools and equipment to develop solutions for a need or opportunityLiving world ST1-5LW-T – identifies how plants and animals are used for food and fibre products | Design and production ST2-2DP-T – selects and uses materials, tools and equipment to develop solutions for a need or opportunityLiving world ST2-5LW-T – describes how agricultural processes are used to grow plants and raise animals for food, clothing and shelter | Design and production ST3-2DP-T – plans and uses materials, tools and equipment to develop solutions for a need or opportunityLiving world ST3-5LW-T – explains how food and fibre are produced sustainably in managed environments for health and nutrition |
| How do humans use plants and animals for food and materials? | * recognise that plants and animals can be used as food, or materials (fibres) for clothing and shelter
 | * identify some plants and animals that are grown and used for food production
 | * investigate and compare advancing technologies used in food and fibre production in Australian agriculture and those used in traditional agriculture
 | * explore examples of managed environments used to produce food and fibre
 |
| Can we design a healthy meal using food and fibre products? | * explore a range of foods obtained from plants and animals
 | * explore the tools, equipment and techniques used to prepare food safely and hygienically for healthy eating
 | * investigate food technologies and techniques used to produce healthy food
 | * explore plants and animals, tools and techniques used to prepare food to enable people to grow and be healthy
* plan, design and produce a healthy meal
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### Term 3, even year – materials: properties and purpose

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| Outcomes | Working scientifically STe-1WS-S – observes, questions and collects data to communicate ideasDesign and production STe-2DP-T – develops solutions to an identified needMaterial world STe-4MW-ST – identifies that objects are made of materials that have observable properties | Working scientifically ST1-1WS-S – observes, questions and collects data to compare and communicate ideasDesign and production ST1-2DP-T – uses materials, tools and equipment to develop solutions for a need or opportunityMaterial world ST1-7MW-T – describes how the properties of materials determine their use | Working scientifically ST2-1WS-S – questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representationsDesign and production ST2-2DP-T – selects and uses materials, tools and equipment to develop solutions for a need or opportunityMaterial world ST2-7MW-T – investigates the suitability of natural and processed materials for a range of purposes | Working scientifically ST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusionsDesign and production ST3-2DP-T – plans and uses materials, tools and equipment to develop solutions for a need or opportunityMaterial world ST3-7MW-T – explains how the properties of materials determines their use for a range of purposes |
| How can we create a product using our knowledge of materials? | * plan, design and evaluate a product considering an identified need or opportunity
 | * design and evaluate a product, demonstrating understanding of the suitability of materials for a purpose
 | * develop a design solution for an identified need or opportunity, using a variety of tools and materials that considers factors such as sustainability and time
 | * design a sustainable product, system or environment individually and/or collaboratively considering the properties of materials
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### Term 4, even year – our changing Earth

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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| Outcomes | Working scientifically STe-1WS-S – observes, questions and collects data to communicate ideasEarth and space STe-6ES-S – identifies how daily and seasonal changes in the environment affect humans and other living things Digital technologies STe-7DI-T – identifies digital systems and explores how instructions are used to control digital devices | Working scientifically ST1-1WS-S – observes, questions and collects data to compare and communicate ideasEarth and space ST1-10ES-S – recognises observable changes occurring in the sky and on the land and identifies Earth’s resources Digital technologies ST1-11DI-T – identifies the components of digital systems and explores how data is represented | Working scientifically ST2-1WS-S – questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representationsEarth and space ST2-10ES-S – investigates regular changes caused by interactions between the Earth and the Sun, and changes to the Earth’s surface Digital technologies ST2-11DI-T – describes how digital systems represent and transmit data | Working scientifically ST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusionsEarth and space ST3-10ES-S – explains regular events in the solar system and geological events on the Earth’s surface Digital technologies ST3-11DI-T – explains how digital systems represent data, connect together to form networks and transmit data |
| How do events on the Earth’s surface affect us? | * observe, ask questions about and describe changes in objects and events
 | * identify and explore the use of a variety of Earth’s resources including water and soil
 | * investigate why the Earth’s surface changes over time as a result of natural processes and human activity
 | * investigate the effects of sudden geological changes and extreme weather events on the Earth’s surface
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|  | Early Stage 1 | Stage 1 | Stage 2 | Stage 3 |
| How are digital technologies used to record and communicate changes on the Earth’s surface? | * explore how people use digital systems to communicate
 | * identify a variety of uses for digital systems
* identify how data is represented as pictures, symbols and diagrams
* collect, explore and sort data, and use digital systems to present the data creatively
 | * explore how digital systems transmit different types of data
* investigate digital and information systems, and explore how they meet personal, school or community needs
* recognise that numbers, text, images, sounds, animations and videos are all forms of data when stored or viewed using a digital system
 | * explore how the main components of digital systems connect together to form networks that transmit data
* identify and explain how existing information systems meet the needs of present and future communities
* use software to interpret and visualise data
 |
| How can we live in harmony with the Earth? | * explore how living things respond to regular changes in their environment
 | * identify how Aboriginal Peoples care for Earth’s resources on-Country
* plan and implement strategies considering conservation of resources to address sustainability and to meet personal and/or community needs
 | * identify that scientific knowledge helps people understand the effect of their actions
 | * investigate ways that advances in science and technology have assisted people to plan for and manage natural disasters to minimise their effect
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[Science and Technology K-6 Syllabus (2017)](https://educationstandards.nsw.edu.au/wps/portal/nesa/k-10/learning-areas/science/science-and-technology-k-6-new-syllabus) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales.