Science and technology K-6 sample scope and sequence

## Semester-based

### Stage 3

#### Semester 1, odd year – living world and digital technologies

Stage 3 of the living world strand focuses on the growth and survival of living things and how their adaptations over time suit their environment. Students investigate how and why food and fibre are produced in sustainable, managed environments that enable people to grow and be healthy. This strand further develops students’ knowledge and understanding of the environmental and biological sciences. Students explore how digital systems use data to form networks and transmit data. They design, follow and modify algorithms to develop solutions to identified problems within a living world context.

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| Outcomes | Focus |
| ST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusions  ST3-2DP-T – plans and uses materials, tools and equipment to develop solutions for a need or opportunity  ST3-3DP-T – defines problems, and designs, modifies and follows algorithms to develop solutions  ST3-4LW-S – examines how the environment affects the growth, survival and adaptation of living things  ST3-5LW-T – explains how food and fibre are produced sustainably in managed environments for health and nutrition  ST3-11DI-T – explains how digital systems represent data, connect together to form networks and transmit data | Growth and survival of living things  Inquiry question: How do physical conditions affect the survival of living things?  Adaptations of living things  Inquiry question: How do the structural and behavioural features of living things support survival?  Sustainably managing environments to source food and fibre  Focus question: Why is it important for food and/or fibre to be produced sustainably?  Using and interpreting data  Focus question: How do components of digital systems interact with each other to transmit data?  Designing digital solutions  Focus question: How do we represent decision-making in an algorithm? |

#### Semester 2, odd year – material world and digital technologies

Stage 3 of the material world strand focuses on how the properties of a range of materials and the way in which they are combined, determine their use and inform design solutions. Students investigate the different properties of solids, liquids and gases, and consider combining and separating mixtures. Stage 3 of this strand introduces students to fundamental concepts of chemistry and is an introduction to materials technologies. Students explore how digital systems use data to form networks and transmit data. They design, follow and modify algorithms to develop solutions to identified problems within a material world context.

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| Outcomes | Focus |
| ST3-1WS-S – plans and conducts scientific investigations to answer testable questions and collects and summarises data to communicate conclusions  ST3-2DP-T – plans and uses materials, tools and equipment to develop solutions for a need or opportunity  ST3-3DP-T – defines problems, and designs, modifies and follows algorithms to develop solutions  ST3-6MW-S – explains the effect of heat on the properties and behaviour of materials  ST3-7MW-T – explains how the properties of materials determine their use for a range of purposes  ST3-11DI-T – explains how digital systems represent data, connect together to form networks and transmit data | States of matter  Inquiry question: How can the state of materials be changed and manipulated?  Mixtures  Inquiry question: What is the result of combining materials?  Properties of materials determine their use  Focus question: Why are the characteristics of materials important when designing and producing?  Using and interpreting data  Focus question: How do components of digital systems interact with each other to transmit data? |

#### Semester 1, even year – Earth and space and digital technologies

Stage 3 of the Earth and space strand focuses on Earth’s place in the solar system, changes on its surface caused by natural disasters and the exploration of how these may be mitigated. Stage 3 of this strand further develops students’ understanding of the Earth, its position in the solar system and as a dynamic part of a complex, interrelated system. Students explore how digital systems use data to form networks and transmit data. Students design, follow and modify algorithms to develop solutions to identified problems within an Earth and space context.

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| Outcomes | Focus |
| ST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusions  ST3-2DP-T – plans and uses materials, tools and equipment to develop solutions for a need or opportunity  ST3-3DP-T – defines problems, and designs, modifies and follows algorithms to develop solutions  ST3-10ES-S – explains regular events in the solar system and geological events on the Earth’s surface  ST3-11DI-T – explains how digital systems represent data, connect together to form networks and transmit data | Earth’s place in our solar system  Inquiry question: How does the Earth compare to other planets in the solar system?  Changes to Earth’s surface  Inquiry question: How do sudden geological changes and extreme weather events affect the Earth’s surface?  Using and interpreting data  Focus question: How do components of digital systems interact with each other to transmit data?  Designing digital solutions  Focus question: How do we represent decision-making in an algorithm? |

#### Semester 2, even year – physical world and digital technologies

Stage 3 of the physical world strand focuses on the difference between contact and non-contact forces and how energy is transformed from one form to another. Students are provided with an opportunity to investigate how electrical energy can control movement in products and systems. Stage 3 of this strand develops students’ abilities to design, test and evaluate a product or system that demonstrates energy transformation, further developing an understanding of the interrelationship between force and energy. Students explore how digital systems use data to form networks and transmit data. They design, follow and modify algorithms to develop solutions to identified problems within a physical world context.

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| Outcomes | Focus |
| ST3-1WS-S – plans and conducts scientific investigations to answer testable questions, and collects and summarises data to communicate conclusions  ST3-2DP-T – plans and uses materials, tools and equipment to develop solutions for a need or opportunity  ST3-3DP-T – defines problems, and designs, modifies and follows algorithms to develop solutions  ST3-8PW-ST – explains how energy is transformed from one form to another  ST3-9PW-ST – investigates the effects of increasing or decreasing the strength of a specific contact or non-contact force  ST3-11DI-T – explains how digital systems represent data, connect together to form networks and transmit data | Describing and exploring specific forces  Inquiry question: How can we make a force stronger or weaker?  Transfer and transformation of energy  Inquiry question: What types of energy transformations can be observed?  Forces and energy in products and systems  Focus question: How can electricity be used in a product or system?  Digital systems and networks  Focus question: How do the components of digital systems connect together to form networks?  Designing digital solutions  Focus question: How do we represent decision-making in an algorithm? |

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