Technologies – Design and Technologies scope and sequence: Foundation to Level 10

| **Foundation to Level 2** | **Levels 3 and 4** | **Levels 5 and 6** | **Levels 7 and 8** | **Levels 9 and 10** |
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| **Achievement standard** |  |  |  |  |
| By the end of Level 2, students identify and describe the purpose of familiar products, services and environments. For each of the 4 Technologies Contexts sub-strands, they identify the features and uses of technologies, and create designed solutions. Students explore and select design ideas based on their personal preferences, and communicate these using simple models and drawings. Students follow sequenced steps to use tools and materials to safely produce designed solutions. | By the end of Level 4, students explain how people design products, services and environments to address needs or opportunities that consider sustainability. For each of the 4 Technologies Contexts sub-strands, they describe the features and uses of technologies, and create designed solutions. Students describe needs or opportunities for designing, and they produce, document and select design ideas against design criteria. They communicate design ideas, using models and drawings as well as annotations and symbols, and they test materials and processes needed to create designed solutions. Students plan and sequence steps, and use technologies and techniques to safely produce designed solutions. | By the end of Level 6, students explain how people address ethical considerations when designing products, services and environments to meet the needs or opportunities of communities. For each of the 4 Technologies Contexts sub-strands, they explain how the features of technologies impact on design decisions, and work collaboratively and in teams to create designed solutions to address identified needs or opportunities. Students work collaboratively to negotiate and develop design criteria that include worldviews or sustainability considerations. They select and explain design ideas, and communicate these design ideas to an audience using technical terms and graphical representation techniques. Students develop project plans, including production processes, and follow the project plans to select technologies and techniques to safely produce designed solutions. | By the end of Level 8, students explain how people design, innovate and produce products, services and environments that address ethical considerations. For each of the 4 Technologies Contexts sub-strands, they discuss how the features of technologies impact on design decisions, and create designed solutions based on analysis of needs or opportunities. Students generate and adapt design ideas, processes and solutions, and justify their decisions against their own and others’ predetermined design criteria for ethical considerations, including sustainability and worldviews. They communicate design ideas and solutions to audiences using technical terms, graphical representation techniques and appropriate attributions. They document production processes independently and collaboratively, and develop and co-develop the production and implementation of these processes to safely produce designed solutions. | By the end of Level 10, students explain how people consider factors that affect design decisions, and the technologies used to design and produce products, services and environments that address ethical considerations. They explain and critique the contribution of innovation, enterprise skills and emerging technologies to sustainability and worldviews. For one or more of the Technologies Contexts sub-strands, students discuss the features of technologies and their appropriateness for purpose, and use design thinking to develop and co-develop designed solutions based on an analysis of identified needs or opportunities. Students create, adapt and refine design ideas, processes and solutions, and justify their decisions against predetermined design criteria that address ethical considerations. They critique and communicate design ideas, processes and solutions to a range of audiences using technical terms, graphical representation techniques and appropriate attributions. Students work independently, collaboratively and in teams to develop and implement project management plans, making adjustments when necessary. They select and use appropriate technologies skilfully to safely produce designed solutions. |
| Content descriptions |
| Strand: Technologies and Society |
| *Students learn about:* |
| how familiar products, services and environments are designed and produced by people to meet personal or local community needs and sustainabilityVC2TDE2S01 | the role of people in design and technologies occupations and factors including sustainability that impact on the design of solutions to meet community needsVC2TDE4S01 | how people in design and technologies occupations consider competing ethical factors including sustainability in the design of products, services and environments VC2TDE6S01 | how people in design and technologies occupations consider ethical factors to design and produce products, services and environments VC2TDE8S01 | how people in design and technologies occupations consider ethical factors to innovate and improve products, services and environments VC2TDE10S01 |
|  |  |  | the impacts of innovation and the development of technologies on designed solutions for ethical considerations including sustainable living VC2TDE8S02 | the impacts of innovation, enterprise and emerging technologies on designed solutions for ethical considerations including sustainable living VC2TDE10S02 |
| Strand: Technologies Contexts |
| Sub-strand: Engineering principles and systems |
| *Students learn to:* |
| explore how technologies affect movement in products and systems VC2TDE2C01 | describe how forces affect function in a product or system VC2TDE4C01 | explain how electrical energy can be transformed into movement, sound or light in a product or system VC2TDE6C01 | analyse how force, motion and energy are used to manipulate and control engineered systems that are ethicalVC2TDE8C01 | analyse and make judgements on how the characteristics and properties of materials are combined with force, motion and energy to control engineered systems that are ethicalVC2TDE10C01 |
| Sub-strand: Food and fibre production |
| *Students learn to:* |
| explore how plants and animals are grown for food, clothing and shelter VC2TDE2C02 | describe the ways of producing food and fibre VC2TDE4C02 | explain how and why food and fibre are produced in managed environments VC2TDE6C02 | analyse how food and fibre are produced in managed environments and how these can become ethicalVC2TDE8C02 | analyse and make judgements on the ethical and secure production and marketing of food and fibre enterprises VC2TDE10C02 |
| Sub-strand: Food specialisations |
| *Students learn to:* |
| explore how food can be selected and prepared for healthy eating VC2TDE2C03 | describe the ways food can be selected and prepared for healthy eating VC2TDE4C03 | explain how the properties of foods influence selection and preparation for healthy eating VC2TDE6C03 | analyse how properties of foods determine preparation and presentation techniques when designing solutions for healthy eating and other ethical considerationsVC2TDE8C03 | analyse and make judgements on how the sensory and functional properties of food influence the design and preparation of ethical including sustainable food solutions for healthy eating VC2TDE10C03 |
| Sub-strand: Materials and technologies specialisations |
| *Students learn to:* |
| explore the characteristics and properties of materials and components that are used to create designed solutionsVC2TDE2C04 | describe how the properties of materials affect function in a product or systemVC2TDE4C04 | explain how characteristics and properties of materials, systems, components and tools affect their use when producing designed solutions VC2TDE6C04 | analyse how characteristics and properties of tools, materials, systems and components can be selected, manipulated and combined to create designed solutions that are ethicalVC2TDE8C04 | analyse and make judgements on how characteristics and properties of materials, systems, components and tools can be combined to create designed solutions that are ethical VC2TDE10C04 |
| Strand: Creating Designed Solutions |
| Sub-strand: Investigating and defining |
| *Students learn to:* |
| explore needs or opportunities, materials, components, tools and processes for designing and creating designed solutionsVC2TDE2D01 | explore needs or opportunities for designing and testing materials, components, tools and processes needed to create designed solutions VC2TDE4D01 | investigate needs or opportunities for designing, and the materials, components, tools and processes needed to create designed solutions VC2TDE6D01 | explain needs or opportunities for designing, and investigate and select tools, materials, processes and components to create designed solutionsVC2TDE8D01 | analyse needs or opportunities for designing; develop design briefs; and investigate, analyse and select materials, systems, components and tools to create designed solutions VC2TDE10D01 |
| Sub-strand: Generating and designing |
| *Students learn to:* |
| explore, generate and communicate design ideas through describing, drawing or modelling, using manual and digital toolsVC2TDE2D02 | generate and communicate design ideas and decisions using technical terms and graphical representation techniques, using manual and digital tools VC2TDE4D02 | generate, iterate and communicate design ideas, decisions and processes using technical terms and graphical representation techniques, using manual and digital tools VC2TDE6D02 | generate, test, iterate and communicate design ideas, processes and solutions using technical terms and graphical representation techniques and appropriate attributions, using manual and digital tools VC2TDE8D02 | apply innovation and enterprise skills to generate, test, iterate and communicate design ideas, processes and solutions, using technical terms and graphical representation techniques and appropriate attributions using manual and digital tools VC2TDE10D02 |
| Sub-strand: Producing and implementing |
| *Students learn to:* |
| use materials, components, tools and techniques to safely make designed solutions VC2TDE2D03 | select and use materials, components, tools and techniques to safely make designed solutionsVC2TDE4D03 | select, explain and use suitable materials, components, tools and techniques to safely make designed solutions VC2TDE6D03 | select, justify and use suitable tools, materials, processes and components to safely make designed solutions VC2TDE8D03 | select, justify, test and use suitable technologies, including processes, and skills, and apply safety procedures to safely make designed solutions VC2TDE10D03 |
| Sub-strand: Evaluating |
| *Students learn to:* |
| describe and select design ideas and solutions based on personal preferences and including sustainability VC2TDE2D04 | use given or predetermined design criteria including sustainability to evaluate design ideas and solutions VC2TDE4D04 | negotiate design criteria that address ethical considerations, including sustainability, to evaluate design ideas, processes and solutions VC2TDE6D04 | collaboratively develop design criteria that include ethical considerations to evaluate design ideas, processes and solutionsVC2TDE8D04 | develop design criteria including sustainability to evaluate design ideas, processes and solutions VC2TDE10D04 |
| Sub-strand: Planning and managing |
| *Students learn to:* |
| sequence steps for making designed solutions cooperativelyVC2TDE2D05 | sequence steps to individually and collaboratively make designed solutions VC2TDE4D05 | develop project plans that include consideration of resources to individually and collaboratively make designed solutions VC2TDE6D05 | develop project plans to individually, collaboratively and in teams manage time, cost and production of designed solutionsVC2TDE8D05 | develop project management plans for intended purposes and audiences to individually and collaboratively and in teams manage projects, taking into consideration time, cost, risk, processes and production of designed solutions VC2TDE10D05 |