**Makers Empire Design Curriculum**  
  
The Makers Empire Design Curriculum describes the development of skills, knowledge and understandings across K-6.

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| The aims of the Makers Empire Design Curriculum are that students:   * develop confidence as designers and problem solvers. * use design thinking processes to generate and communicate design ideas * produce designed solutions suitable for a range of technologies contexts by selecting and manipulating a range of materials, systems, components, tools and equipment creatively, competently and safely; and managing processes * evaluate processes and designed solutions and transfer knowledge and skills to new situations * become competent users of 3D design and 3D printing. * Spatial awareness * understand how technology is and can be used to develop designed solutions in real-world contexts and for a range of users. | The Makers Empire Design curriculum is aligned to and based on design and technology, and engineering curricula from around the world including:   * The Australian Curriculum: Technologies, Design and Technologies * The NSW Syllabus: Science K-10 (incorporating Science and Technology K-6) * Victorian Curriculum: Technologies, Design and Technologies * Next Generation Science Standards (NGSS): Engineering Design (US) * ISTE Standards for Students:  Innovative Designer | The Makers Empire Design Curriculum has 6 content strands:   1. Technology Applications 2. Investigating 3. Generating Ideas 4. Prototyping and Modelling 5. Testing and Evaluating 6. Planning and Managing   The 6 content strands include skills, knowledge and understandings that develop across three bands:  **K-2**, **3-4** and **5-6**. |

Makers Empire Design Curriculum **K-2**

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|  | Makers Empire  Strand | Makers Empire Outcome | Australian  Curriculum | NSW | Vic | Next Gen | ISTE |
| 1 | Technology Applications |  |  |  |  |  |  |
|  | 1.1K2 | Recognises examples of design being used to produce familiar products and meet community needs. | ACTDEK001 | ST1-16P | Technologies and Society  F-Level 2 | K-2-ETS1-1. | 4a |
|  | 1.2K2 | Explores how technologies are used to create solutions | ACTDEK002 | ST1-15I | Technologies and Contexts  F-Level 2 | K-2-ETS1-1. | 4a |
|  | 1.3K2 | Explores how properties of materials and components of designed objects relate to their function and purpose | ACTDEK004 | ST1-14BE | Technologies and Contexts  F-Level 2 | K-2-ETS1-1. | 4a |
| 2 | Investigating |  |  |  |  |  |  |
|  | 2.1K2 | Makes observations, asks questions and describes needs and opportunities in given situations | ACTDEP005 | ST1-4WS | Investigating  F-Level 2 | K-2-ETS1-1. | 4.d |
|  | 2.2K2 | Defines a simple problem that could be improved with a designed solution | ACTDEP005 | ST1-4WS | Investigating  F-Level 2 | K-2-ETS1-1. | 4.a |
| 3 | Generating Ideas |  |  |  |  |  |  |
|  | 3.1K2 | Generates ideas for designs | ACTDEP006 | ST1-5WT | Generating  F-Level 2 | K-2-ETS1-2. | 4.a |
|  | 3.2K2 | Communicates and records design ideas | ACTDEP006 | ST1-5WT | Generating  F-Level 2 | K-2-ETS1-2. | 4.a |
| 4 | Prototyping and Modelling |  |  |  |  |  |  |
|  | 4.1K2 | Uses specific features in digital 3D modelling tools | ACTDEP007 | ST1-5WT | Producing  F-Level 2 | K-2-ETS1-2. | 4.b |
|  | 4.2K2 | Follow directions using common position words and movements | ACTDEP007 | ST1-5WT | Producing  F-Level 2 | K-2-ETS1-2. | 4.b |
|  | 4.3K2 | Explains how the shape of an object relates to its function | ACTDEP007 | ST1-5WT | Producing  F-Level 2 | K-2-ETS1-2. | 4.b |
|  | 4.4K2 | Uses 3D modelling tools to create designs, prototypes and models | ACTDEP007 | ST1-5WT | Producing  F-Level 2 | K-2-ETS1-2. | 4.b |
| 5 | Testing and Evaluating |  |  |  |  |  |  |
|  | 5.1K2 | Develops simple tests to evaluate designs created for specific purposes | ACTDEP008 | ST1-5WT | Evaluating  F-Level 2 | K-2-ETS1-3. | 4.c |
|  | 5.2K2 | Makes adjustments to designs based on tests and feedback | ACTDEP008 | ST1-5WT | Evaluating  F-Level 2 | K-2-ETS1-3. | 4.d |
| 6 | Planning and Managing |  |  |  |  |  |  |
|  | 6.1K2 | Sequences steps for creating designs | ACTDEP009 | ST1-5WT | Planning and Managing  F-Level 2 | K-2-ETS1-2. | 4a. |
|  | 6.2K2 | Works collaboratively with others to create designs | ACTDEP009 | ST1-5WT | Planning and Managing  F-Level 2 | K-2-ETS1-2. | 4a. |

Makers Empire Design Curriculum **3-4**

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|  | Makers Empire  Strand | Makers Empire Outcome | Australian  Curriculum | NSW | Vic | Next Gen | ISTE |
| 1 | Technology Applications |  |  |  |  |  |  |
|  | 1.134 | Identifies factors that impact on products and services to meet community needs and consider sustainability. | ACTDEK010 | ST2-14BE | Technologies and Society  Levels 3 and 4 | 3-4-ETS1-1. | 4a |
|  | 1.234 | Explains how forces and the property of materials affect the way a product behaves or performs | ACTDEK011 | ST2-15I | Technologies and Contexts  Levels 3 and 4 | 3-4-ETS1-1. | 4a |
|  | 1.334 | Investigates the suitability of materials, systems, components, tools and equipment for a range of purposes | ACTDEK013 | ST2-16P | Technologies and Contexts  Levels 3 and 4\ | 3-4-ETS1-1. | 4a |
| 2 | Investigating |  |  |  |  |  |  |
|  | 2.134 | Defines a problem by identifying opportunities, critiquing needs, making predictions and analysing collected data | ACTDEP014 | ST2-4WS | Investigating  Levels 3 and 4 | 3-5-ETS1-1. | 4.d |
|  | 2.234 | Identifies criteria for success for a designed solution including sustainability considerations | ACTDEP014 | ST2-4WS | Investigating  Levels 3 and 4 | 3-5-ETS1-1. | 4.a |
| 3 | Generating Ideas |  |  |  |  |  |  |
|  | 3.134 | Generates and compares design ideas and makes decisions about design ideas most likely to meet the design criteria and constraints. | ACTDEP015 | ST2-5WT | Generating  Levels 3 and 4 | 3-5-ETS1-2. | 4.a |
|  | 3.234 | Communicates and records design ideas using technical terms and graphical representation techniques. | ACTDEP015 | ST2-5WT | Generating  Levels 3 and 4 | 3-5-ETS1-2. | 4.a |
| 4 | Prototyping and Modelling |  |  |  |  |  |  |
|  | 4.134 | Uses and chooses specific features in digital 3D modelling tools | ACTDEP016 | ST2-5WT | Producing  Levels 3 and 4 | 3-5-ETS1-2. | 4.b |
|  | 4.234 | Interprets information and follows instructions using directional language. | ACTDEP016 | ST2-5WT | Producing  Levels 3 and 4 | 3-5-ETS1-2. | 4.b |
|  | 4.334 | Explains their design decisions related to the design criteria, including the use of symmetry, shapes and angles. | ACTDEP016 | ST2-5WT | Producing  Levels 3 and 4 | 3-5-ETS1-2. | 4.b |
|  | 4.434 | Uses 3D modelling tools to create structurally sound designs, prototypes and models | ACTDEP016 | ST2-5WT | Producing  Levels 3 and 4 | 3-5-ETS1-2. | 4.b |
| 5 | Testing and Evaluating |  |  |  |  |  |  |
|  | 5.134 | Develops fair tests with guidance to evaluate designs against identified design criteria | ACTDEP017 | ST2-5WT | Evaluating  Levels 3 and 4 | 3-5-ETS1-3. | 4.c |
|  | 5.234 | Makes further improvements and iterations of designs based on test results and feedback in order to address design criteria | ACTDEP017 | ST2-5WT | Evaluating  Levels 3 and 4 | 3-5-ETS1-3. | 4.d |
| 6 | Planning and Managing |  |  |  |  |  |  |
|  | 6.134 | Plans a sequence of production steps when making designed solutions | ACTDEP018 | ST1-5WT | Planning and Managing  Levels 3 and 4 | 3-5-ETS1-2. | 4a. |
|  | 6.234 | Works collaboratively with others to plan, make and evaluate designs that address identified criteria | ACTDEP018 | ST1-5WT | Planning and Managing  Levels 3 and 4 | 3-5-ETS1-2. | 4a. |

Makers Empire Design Curriculum **5-6**

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|  | Makers Empire  Strand | Makers Empire Outcome | Australian  Curriculum | NSW | Vic | Next Gen | ISTE |
| 1 | Technology Applications |  |  |  |  |  |  |
|  | 1.156 | Explains how competing considerations, including sustainability are addressed in the design of products and services to meet community needs | ACTDEK019 | ST3-151 | Technologies and Society  Levels 5 and 6 | MS-ETS1-1. | 4a |
|  | 1.256 | Investigates how sources of energy can control movement, sound or light in a designed product | ACTDEK020 | ST3-14BE | Technologies and Contexts  Levels 5 and 6 | MS-ETS1-1. | 4a |
|  | 1.356 | Investigates characteristics and properties of a range of materials, systems, components, tools and equipment, and evaluate the impact of their use | ACTDEK023 | ST3-16P | Technologies and Contexts  Levels 5 and 6 | MS-ETS1-1. | 4a |
| 2 | Investigating |  |  |  |  |  |  |
|  | 2.156 | Investigates a range of needs, opportunities or problems by posing testable questions and gathering data; and defines them in terms of functional design requirements | ACTDEP024 | ST3-4WS | Investigating  Levels 5 and 6 | MS-ETS1-1. | 4.d |
|  | 2.256 | Negotiates criteria for success including sustainability considerations and constraints on materials, time, or cost | ACTDEP024 | ST3-4WS | Investigating  Levels 5 and 6 | MSETS1-1. | 4.a |
| 3 | Generating Ideas |  |  |  |  |  |  |
|  | 3.156 | Generates and compares design ideas and evaluates competing design solutions using a systematic process to determine how well they meet the negotiated criteria and constraints | ACTDEP025 | ST3-5WT | Generating  Levels 5 and 6 | MS-ETS1-2. | 4.a |
|  | 3.256 | Communicates and presents design ideas and processes for specific audiences using appropriate technical terms and graphical representation techniques | ACTDEP025 | ST3-5WT | Generating  Levels 5 and 6 | MS-ETS1-2. | 4.a |
| 4 | Prototyping and Modelling |  |  |  |  |  |  |
|  | 4.156 | Demonstrates efficient use of the tools and features of 3D modelling software | ACTDEP026 | ST3-5WT | Producing  Levels 5 and 6 | MS-ETS1-4. | 4.b |
|  | 4.256 | Creates and interprets 3D models and diagrams | ACTDEP026 | ST3-5WT | Producing  Levels 5 and 6 | MS-ETS1-4. | 4.b |
|  | 4.356 | Explains their design decisions in terms of the design criteria including the specific applications of features and properties of 2D and 3D shapes | ACTDEP026 | ST2-5WT | Producing  Levels 5 and 6 | MS-ETS1-4. | 4.b |
|  | 4.456 | Uses 3D modelling tools to create structurally sound designs, prototypes and models including 3D printed prototypes | ACTDEP026 | ST3-5WT | Producing  Levels 5 and 6 | MS-ETS1-4. | 4.b |
| 5 | Testing and Evaluating |  |  |  |  |  |  |
|  | 5.156 | Develops fair tests and analyses test data to evaluate designs against identified design criteria and constraints | ACTDEP027 | ST3-5WT | Evaluating  Levels 5 and 6 | MS-ETS1-3. | 4.c |
|  | 5.256 | Uses a systematic process to make modifications and iterations of designs based on test results and feedback in order to address design criteria and constraints | ACTDEP027 | ST3-5WT | Evaluating  Levels 5 and 6 | MS-ETS1-3. | 4.d |
| 6 | Planning and Managing |  |  |  |  |  |  |
|  | 6.156 | Develops project plans that include consideration of resources for making designed solutions | ACTDEP028 | ST3-5WT | Planning and Managing  Levels 5 and 6 | MS-ETS1-2. | 4a. |
|  | 6.256 | Works collaboratively with others to design processes, production techniques and testing procedures to achieve negotiated design criteria | ACTDEP028 | ST3-5WT | Planning and Managing  Levels 5 and 6 | MS-ETS1-2. | 4a. |