Sample teaching planner –
Materials and technologies specialisations

Design and Technologies

Foundation to Level 6

**Disclaimer:** It is the responsibility of the school to ensure that duty of care is exercised in relation to the health and safety of all students undertaking any activities suggested in this teaching planner.

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Introduction

Materials and technologies specialisations explores the design process and materials, systems, components, tools, equipment and techniques used to make products for end users. Students consider environmental, social and ethical issues related to design and come to understand the importance of safety when working with materials and technologies.

This teaching planner identifies themes, key messages and ideas for teaching content from specific content descriptions of Materials and technologies specialisations Foundation to Level 6. The information in the teaching planner has been provided to assist teachers to design and plan teaching and learning programs that are suitable for their own cohort of students. The ideas for teaching curriculum content are not intended to comprise a sequence of learning but rather they are ideas to support teachers to plan suitable lessons.

Please note, teachers are advised to use their professional judgment to ensure lesson plans comprehensively address the relevant content descriptions.

Online resources for Materials and technologies specialisations

To complement the sample teaching planner, a suite of online resources has been curated and published on FUSE’s [Materials and foods specialisations page](https://fuse.education.vic.gov.au/pages/materialstechnologies). The resources are categorised according to the four themes identified in this sample teaching planner and support the teaching of content in the Technologies Contexts sub-strand Materials and technologies specialisations in Victorian Curriculum F–10 Design and Technologies.

Hyperlinks to relevant FUSE resources, plus other online resources, are included within the ‘Ideas for the classroom’ sections in this teaching planner.

Key theme 1: Designing and producing with textiles and fashion products

The ‘Ideas for the classroom’ in this theme promote skills, knowledge and understanding of concepts related to non-resistant materials.

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|  | **Foundation to Level 2** | **Levels 3 and 4** | **Levels 5 and 6** |
| **Key messages** | * Products can be made from textiles and fabrics.
* Textile and fashion products can meet different individual, family and community needs.
 | * Sustainability issues are important considerations for all textile and fashion designers.
 | * Textile and fashion products can be mass-produced.
* Textile and fashion products from the past and the present have an impact on the local community and the sustainability of the environment.
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| **Ideas for the classroom** | * Explore existing textile and fashion products and identify an individual’s needs, such as a jumper for warmth, a towel to dry their hands, sports clothing for comfort and to keep sweat away from the body, pillow for softness, or hats for protection from sun or rain.
* Create a safety poster or video that identifies how to use scissors safely to cut fabric, wool and threads.
* Investigate tools and equipment through play to discover possible ways that materials like wool, cotton, felt and hessian can be joined.
* Make finger puppets for a special family event using fabric. As a class, discuss the steps that are required to make the finger puppets.
* As a class, evaluate a textile or fashion product in terms of its function and the materials used to make it. For example, when evaluating a pair of gloves, some questions to ask include:
* Are the materials they are made from warm?
* How well do they fit my hands?
* Do they feel nice against my skin?
* As a class, test how waterproof a range of fabrics are and determine which fabric would be most suitable for a rain jacket, or test the absorbency of different types of fabrics and identify which fabric would be most suitable to make tea towels. Students provide a reason for their choice.
* Discuss tools and equipment that could be used to make birthday decorations from different types of fabrics and textile products, and demonstrate the production process.
 | * Discuss a variety of sustainable textile and fashion materials, such as bamboo, wool and organic cotton, and their application in environmentally friendly products
* Design a pouch for sunglasses, using recycled textiles or fashion materials, and share ideas with the class. Generate two or three design options for the proposed pouch by drawing ideas free-hand or using 3D modelling software such as SketchUp. Make annotations to identify the recycled materials that are used in the designs. Further [information about SketchUp](https://fuse.education.vic.gov.au/ResourcePackage/ByPin?pin=7BJL84) can be found on FUSE.
* Test the comfort of old scarves that could be recycled and made into hand warmers. Which scarves feel the best, softest or warmest? Discuss how to create a test to determine the best scarves to use.
* Conduct some research related to different styles of a common product, such as different styles of caps or hat. Students could ask members of their family which product they prefer based on pre-determined criteria such as suitability to shade from sun and colour. Share findings as a class.
 | * Students design a cushion that represents their favourite animal and uses several joining techniques and sustainable materials. Provide prompting questions to students to assist with their design. Generate two or three design options and gather feedback from classmates regarding which options they prefer.
* Test a variety of joining materials for specific purposes in clothing items, for example Velcro could be tested for ease of use as a joining method for hand warmers worn by people with arthritis.
* Investigate ways a production line could be set up to produce soft toys made from discarded clothing for rescue animals in a local community shelter, and consider the impact the product could have on the community and environment.
* Generate design ideas for a textile or fashion product for an individual, such as a fabric key fob. Use the [SCAMPER technique](https://www.youtube.com/watch?v=tB-3-xqQc_c) to assist students to generate creative ideas for their design ideas for the fabric key fob, for example use ‘Modify’ questions such as:
* What features can be made longer, bigger or stronger using fabric?
* Can I increase the end user group?
* What can I delete or tone down?
* What features can I magnify using fabric?
* Can I include extra features?
 |
| **Content descriptions** | * Explore the characteristics and properties of materials and components that are used to create designed solutions [(VCDSTC017)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC017)
* Explore needs or opportunities for designing, and the technologies needed to realise designed solutions [(VCDSCD018)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD018)
* Use materials, components, tools, equipment and techniques to produce designed solutions safely [(VCDSCD020)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD020)
* Use personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment [(VCDSCD021)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD021)
* Sequence steps for making designed solutions [(VCDSCD022)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD022)
 | * Investigate the suitability of materials, systems, components, tools and equipment for a range of purposes [(VCDSTC027)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC027)
* Critique needs or opportunities for designing and explore and test a variety of materials, components, tools and equipment and the techniques needed to create designed solutions [(VCDSCD028)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD028)
* Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques [(VCDSCD029)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD029)
 | * Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use [(VCDSTC037)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC037)
* Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended designed solutions [(VCDSCD038)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD038)
* Generate, develop, communicate and document design ideas and processes for audiences using appropriate technical terms and graphical representation techniques [(VCDSCD039)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD039)
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Key theme 2: Designing and producing with paper, cardboard, plastic, wood and metal

The ‘Ideas for the classroom’ in this theme promote skills, knowledge and understanding of concepts related to resistant materials, paper and cardboard.

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|  | **Foundation to Level 2** | **Levels 3 and 4** | **Levels 5 and 6** |
| **Key messages** | * Products can be made from resistant materials and paper to meet different needs.
* Different tools and equipment are required when working with different resistant materials or paper.
 | * Resistant materials have different characteristics and properties.
* Resistant materials use different joining techniques.
 | * The use of products made from resistant materials can impact on the community and environment.
* Making products from resistant materials requires safe use of a variety of tools, equipment and techniques.
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| **Ideas for the classroom** | * Demonstrate how to use tools and equipment such as a stapler and paper scissors to support safe work practices.
* Investigate tools and equipment through play to discover possible ways that materials like paper, cardboard and plastic can be joined.
* Brainstorm ideas for different types of materials that could be used for birthday decorations. Then work in small groups to draw ideas of how these materials could be used to make birthday decorations. Share ideas with the class.
* As a class, develop a list of steps for making a greeting card. Draw a flow chart of the production steps on the board and ask students to draw and annotate the materials and equipment needed to make the card.
 | * Using cardboard, produce a template for a 3D superhero or building and demonstrate how to use tools and equipment to support safe work practices. Explain the importance of accuracy when creating the template.
* Discuss the tools and equipment needed to make a cupcake holder using paper, and demonstrate the production process. As a class, document the steps in the production process, for example as a flow chart, and identify the tools, equipment and safety considerations for each step.
* Discuss the properties of materials by testing the strength and/or stiffness of different types of cardboard to make an iPad holder.
* Produce a product that uses a joining technique, for example a cardboard skeleton that is joined using split pins or string.
 | * Investigate ways a production line could be set up to produce a product for the local community, considering the impact the product could have on the community and environment, for example cardboard visor hats for children at a local childcare centre.
* Develop a series of sequenced steps for making hand warmers, for example a flow chart of the production steps, and list the materials, equipment and safety considerations required at each step.
* Produce a cardboard product from recycled boxes that uses a variety of joining methods such as slits and slots, paper clips and glue.
 |
| **Content descriptions** | * Explore the characteristics and properties of materials and components that are used to create designed solutions [(VCDSTC017)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC017)
* Visualise, generate, and communicate design ideas through describing, drawing and modelling [(VCDSCD019)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD019)
* Explore needs or opportunities for designing, and the technologies needed to realise designed solutions [(VCDSCD018)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD018)
* Use materials, components, tools, equipment and techniques to produce designed solutions safely [(VCDSCD020)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD020)
 | * Investigate the suitability of materials, systems, components, tools and equipment for a range of purposes [(VCDSTC027)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC027)
* Critique needs or opportunities for designing and explore and test a variety of materials, components, tools and equipment and the techniques needed to create designed solutions [(VCDSCD028)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD028)
* Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques [(VCDSCD029)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD029)
* Select and use materials, components, tools and equipment using safe work practices to produce designed solutions [(VCDSCD030)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD030)
 | * Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use [(VCDSTC037)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC037)
* Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended designed solutions [(VCDSCD038)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD038)
* Apply safe procedures when using a variety of materials, components, tools, equipment and techniques to produce designed solutions [(VCDSCD040)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD040)
* Develop project plans that include consideration of resources when making designed solutions [(VCDSCD042)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD042)
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Key theme 3: Exploring characteristics and properties of materials

The ‘Ideas for the classroom’ in this theme promote skills, knowledge and understanding of concepts related to attributes identified by the senses and distinctive qualities of materials.

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|  | **Foundation to Level 2** | **Levels 3 and 4** | **Levels 5 and 6** |
| **Key messages** | * A product can be made from different materials.
* Different materials can affect how a product functions.
 | * Sustainable materials can lessen environmental impact.
* Tests can be conducted to determine specific properties of materials.
 | * The properties of a materials can affect the way a product functions.
* Materials can be natural or manufactured.
* New materials can be created.
* Products can be created using different joining, connecting and assembly techniques.
 |
| **Ideas for the classroom** | * Watch [the 3C Materials song](https://fuse.education.vic.gov.au/Resource/ByPin?Pin=FQJ7N9&SearchScope=All), which provides information about different types of materials and how they are selected to be made into products according to their properties. Ask students:
* Why you would not wear paper clothes in the rain?
* Why would you not use wood as a window pane?
* What properties do you want in the materials for a jumper?
* Identify basic physical properties of a variety of everyday materials, for example hard, soft, flexible, rigid or waterproof.
* Identify which material or materials are commonly used to make the following products: key, drinking glass, backpack, book, coat, door handle, sports top, shoes, ladder, cushion, tissues, saucepan, etc.
* Bring in a range of products made from different materials (for example a bottle made from plastic, a jumper made from wool, a key made from metal) and ask students to distinguish between a product and the material from which it is made.
* Classify a variety of everyday products on the basis of their basic physical properties; for example, put all waterproof products together or classify the products according to whether they are shiny and metallic-looking or not. Or classify the products according to the materials they are made from, such as by placing all the wooden products together or putting together all the products made using fabrics or not.
* Undertake tests to determine the properties of different everyday materials, such as plastics, wood, wool and cotton, in regards to their ability to float or sink, and their hardness or softness. Refer to the [Department of Education and Training teaching resource](file:///C%3A/Users/02204947/AppData/Local/Microsoft/Windows/INetCache/Content.Outlook/7TZCF3G1/%E2%80%A2%09https%3A/www.education.vic.gov.au/school/teachers/teachingresources/discipline/science/continuum/Pages/floatsink.aspx) for ideas to teach concepts related to floating and sinking.
 | * Discuss the properties of materials by testing the strength and/or stiffness of different types of cardboard to make a holder for a tablet or other device.
* Compare the suitability of a variety of everyday materials, including wood, metal, plastics, glass, brick, clay, paper and cardboard, for particular uses.
* Discuss the properties of materials used to make specific common products and why they are used to make these specific products, for example:
* rubber for the soles of shoes or thongs
* wool for a blanket or beanie
* glass for a window or bowl
* cotton for a bath towel or shirt
* wood for a table or chair
* leather for a belt or gloves
* plastic for a phone cover or drink bottle
* metal for jewellery or a gate
* paper for a writing pad or envelopes
* stone for a wall or a chopping board.
* Undertake tests to determine the properties of different everyday materials, such as plastics, wood, wool and cotton, according to their hardness, flexibility, solubility, transparency, conductivity (electrical and thermal) and response to magnets. Then ask students to provide specific uses for each material based on the results of their tests. Share ideas with the class. [Examples of material tests](https://fuse.education.vic.gov.au/Resource/ByPin?Pin=D8WTXN&SearchScope=All) can be found on FUSE.
* Distinguish between natural and manufactured materials. Discuss examples of natural materials, such as wood, stone, copper, silk, wool, cotton and hemp, and examples of manufactured materials, such as plastics, cement, glass, rubber, leather, sand, metal and paper.
* Discuss products that use a variety of joining techniques. Discuss the materials that are used in these products and the types of joining techniques used. Identify if other types of joining techniques could be used. [Ideas for joining techniques](https://fuse.education.vic.gov.au/Resource/ByPin?Pin=428BM5&SearchScope=All) can be found on FUSE.
 | * Test the comfort of old scarves that could be recycled and made into hand warmers. Develop a series of sequenced steps for making hand warmers, for example a flow chart of the production steps, and list the materials, equipment and safety considerations required at each step.
* Ask students to explore examples of products made from natural materials and examples of products made from manufactured materials and identify reasons for similarities and differences between these products.
* Watch the video [‘Material World: Crash Course Kids #40.1’ via FUSE](http://fuse.education.vic.gov.au/?MWFLW2) and discuss how we make new materials or improve materials we already have. Investigate the roles of the people who make these new or improved products.
 |
| **Content descriptions** | * Explore the characteristics and properties of materials and components that are used to create designed solutions [(VCDSTC017)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC017)
* Explore needs or opportunities for designing, and the technologies needed to realise designed solutions [(VCDSCD018)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD018)
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 | * Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use [(VCDSTC037)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC037)
* Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended designed solutions [(VCDSCD038)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD038)
* Generate, develop, communicate and document design ideas and processes for audiences using appropriate technical terms and graphical representation techniques [(VCDSCD039)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD039)
* Investigate how people in design and technologies occupations address competing considerations, including sustainability, in the design of solutions for current and future use [(VCDSTS033)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS033)
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Key theme 4: Making sustainable and innovative products

The ‘Ideas for the classroom’ in this theme promote skills, knowledge and understanding of concepts related to problem-solving using the Creating Designed Solutions strand.

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|  | **Foundation to Level 2** | **Levels 3 and 4** | **Levels 5 and 6** |
| **Key messages** | * Products can be produced by redeveloping objects through play and modelling.
* Products and systems can be produced for an individual, a family or a community based on existing products.
 | * Using suitable materials and joining techniques will result in products that function as intended.
* Selecting and correctly using a variety of sustainable materials, components, tools, equipment and techniques supports safe work practices.
 | * Products can be created using different joining, connecting and assembly techniques.
* Products can be evaluated according to sustainability considerations.
 |
| **Ideas for the classroom** | * Explore types of materials that could be recycled to make birthday decorations, such as cardboard, plastic, felt and hessian.
* Explore how food packaging could be used to make marionettes or shadow puppets. Ask students to draw their ideas and then use the packaging to create models of the marionettes or shadow puppets.
* Explore existing products that meet community needs, such as signage for organically grown produce sold at a community farmers’ market.
* Investigate plastic-free lunch boxes, and discuss the reasons why individuals would use these products.
* Referring to a variety of different types of drink bottles, discuss as a class whether you consider each bottle type to be environmentally friendly or unfriendly.
* As a class, evaluate a product in terms of its function and the materials used to make it. For example, when evaluating a backpack, some questions to ask to evaluate it include:
* Is it made from recyclable materials?
* Considering both shape and size, how well does it hold items to carry to and from school?
* How comfortable it is on your back or to hold?
* Is it easy to open the compartments?
 | * Examine products made from materials that were going to be thrown away, such as sandwich bags, toothbrushes, reusable coffee cups or grocery shopping bags, and analyse how using them addresses sustainability considerations.
* Compare plastic water bottles to bamboo water bottles, and identify what materials each product is made from and the product’s functionality and durability.
* Test the durability and absorbency of newspaper, wrapping paper and cardboard packaging that could be used to make cupcake holders.
* Explore [what materials can be recycled](https://fuse.education.vic.gov.au/Resource/ByPin?Pin=FBC8CM&SearchScope=All). Discuss why it is important to recycle materials.
* Discuss how joining techniques can contribute to sustainability, for example using a running stitch on the hem of a dress or hammering a nail to fix a wooden toy.
* Demonstrate how to use tools and equipment to support safe work practice when using a Stanley knife to cut cardboard.
* Examine examples of locally made or Australian products and discuss their environmental and/or social sustainability impacts.
* Evaluate a product according to how well it functions in terms of its design, and the sustainability of the materials used to make it. For example, when evaluating a pouch for sunglasses, some questions to ask to evaluate it include:
* What fabric is it made from?
* How durable is the fabric it is made from?
* How well does its design hold a pair of sunglasses?
* How well does the pouch protect the sunglasses from possible damage?
* Design a holder for a tablet or other device using recycled materials, and share ideas with the class. Generate two or three design options for the proposed designed solution and draw ideas free-hand or using 3D modelling software such as SketchUp. Make annotations to identify the recycled materials that are used in the designs. Further [information about SketchUp](https://fuse.education.vic.gov.au/ResourcePackage/ByPin?pin=7BJL84) can be found on FUSE.
 | * Evaluate a cardboard mug holder according to its design and the sustainability of the materials used to make it. Ask students to identify questions that they could ask themselves to evaluate the cardboard mug holder.
* Discuss products that use a variety of different joining, connecting and assembly techniques, such as cars or jackets, and that also consider the environment.
* Assess the risks involved in using certain tools and equipment, and explain how these potential hazards can be managed. Demonstrate how tools were used safely to produce a designed solution.
* Generate design ideas for a designed solution that considers the local community and its environment, such as trays to hold takeaway food at a local fete that are made from recycled materials.
* Investigate if cotton or polyester fabric is better for the environment. Consider the energy and water used to produce each, as well as their durability, resistance to stains and washing requirements. Share your thoughts with others.
* Explore mass-produced products from both the past and the present, such as toys, car tyres, light globes or safety gloves, and analyse how they have changed technologically, aesthetically or in function. Assess the sustainability of the modern product compared to the past product.
* Identify a range of tools and equipment and discuss how each could be used to make hand warmers or a holder for a tablet or other device. Ask students to demonstrate how each could be used safely in the production process.
 |
| **Content descriptions** | * Explore the characteristics and properties of materials and components that are used to create designed solutions [(VCDSTC017)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTC017)
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* Negotiate criteria for success that include consideration of environmental and social sustainability to evaluate design ideas, processes and solutions [(VCDSCD041)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSCD041)
* Investigate how people in design and technologies occupations address competing considerations, including sustainability, in the design of solutions for current and future use [(VCDSTS033)](https://victoriancurriculum.vcaa.vic.edu.au/Curriculum/ContentDescription/VCDSTS033)
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