# Australian Curriculum: Technologies

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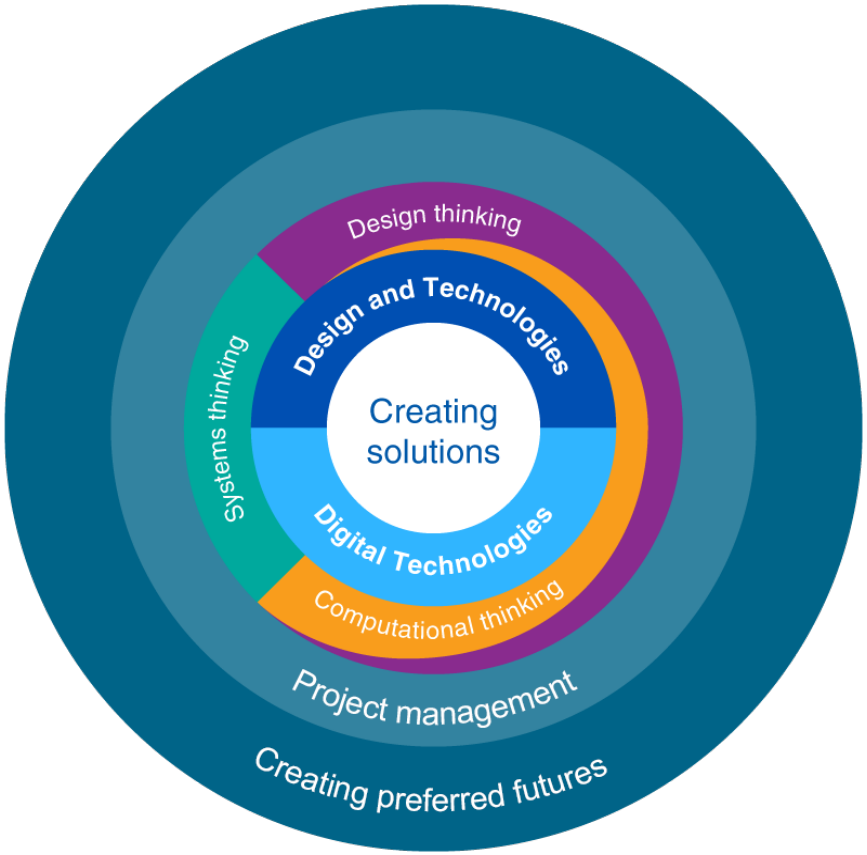
# Technologies curriculum

Curriculum has been developed:

- from Foundation to Year 8 in two subjects: Design and Technologies and Digital Technologies
- from Years 9 to 10 in two optional subjects: Design and Technologies and Digital Technologies



# Design and Technologies

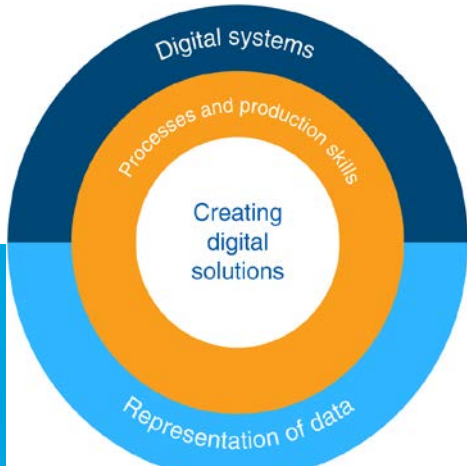
Comprises two related strands:

- Design and Technologies knowledge and understanding – the use, development and impact of technologies and design ideas across a range of technologies contexts: engineering principles and systems; food and fibre production; food specialisations; materials and technologies specialisations
- Design and Technologies processes and production skills – the skills needed to design and produce designed solutions.

# Digital Technologies structure

Comprises two related strands:

- Digital Technologies knowledge and understanding – the information system components of data, and digital systems (hardware, software and networks)
- Digital Technologies processes and production skills – using digital systems to create ideas and information, and to define, design and implement digital solutions, and evaluate these solutions and existing information systems against specified criteria.



# ICT in the Australian Curriculum

- the capability assists students to become effective *users* of ICT
- the Digital Technologies curriculum assists students to become confident *creators* of digital solutions

# Design and Technologies (Available for use; awaiting final endorsement)



Overview
Design and Technologies - Curriculum

Show/Hide Curriculum
- [x] Band level descriptions
- [x] Content descriptions
- [x] Achievement standards
- [x] Icons

Reset filters | Apply filters

Band Levels
- [x] Select all
- [x] Foundation to Year 2
- [x] Year 3 and 4
- [x] Year 5 and 6
- [x] Year 7 and 8
- [x] Year 9 and 10

Strands
- [x] Select all
- [x] Design and Technologies processes and production skills
- [x] Design and Technologies

General capabilities
- [ ] Select all
- [ ] Literacy
- [ ] Numeracy
- [ ] Information and communication technology capability

## Curriculum

Jump to: F-2 3-4 5-6 7-8 9-10

### Foundation to Year 2

#### Foundation to Year 2 Band Description

Learning in Design and Technologies builds on concepts, skills and processes developed in the Early Years Learning Framework, revisiting, strengthening and extending these as needed.

By the end of Year 2 students will have had the opportunity to create designed solutions at least once in each of the following technologies contexts: Engineering principles and systems; Food and...

Read full description ›

#### Foundation to Year 2 Content Descriptions

**Design and Technologies knowledge and understanding**

Identify how people design and produce familiar products, services and environments and consider sustainability to meet personal and local community needs (ACTDEK001)

Explore how technologies use forces to create movement in products (ACTDEK002)

Explore how plants and animals are grown for food, clothing and shelter and how food is selected and prepared for healthy eating (ACTDEK003)

Explore the characteristics and properties of materials and components that are used to produce designed solutions (ACTDEK004)

**Design and Technologies processes and production skills**

Explore needs or opportunities for designing, and the technologies needed to realise designed solutions (ACTDEP005)

Visualise, generate, develop and communicate design ideas through describing, drawing and modelling (ACTDEP006)

Use materials, components, tools, equipment and techniques to safely make designed solutions (ACTDEP007)

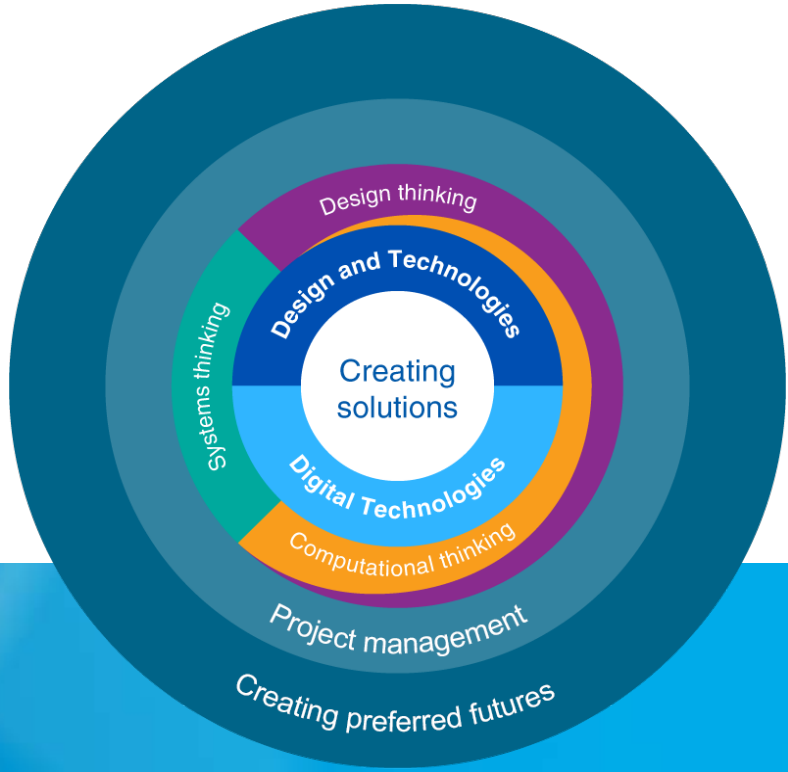
Use personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment (ACTDEP008)

# National priorities

- Food and water security
- Health and wellbeing
- Knowledge economy
- Engineering, construction and manufacturing
- Innovation

# Key ideas

- Creating preferred futures
- Project management
- Types of thinking:
  - ➢ design thinking
  - ➢ computational thinking
  - ➢ systems thinking



# Design thinking

- underpins learning in Design and Technologies and used in Digital Technologies
- involves strategies to support the design process
- processes and production skills strand reflects the design process:

  investigating, generating, producing, evaluating, collaborating and managing

# Computational thinking

- underpins learning in Digital Technologies and is used in Design and Technologies
- problem-solving method that is applied to create solutions that can be implemented using digital technologies
- involves integrating strategies, such as organising data logically, breaking down problems into parts, interpreting patterns and models and designing and implementing algorithms.

# Systems thinking

- Holistic approach to the identification and solving of problems
- Components of a system, and their interactions and interrelationships
- When generating ideas and decisions made throughout design processes, students need to understand systems and work with complexity, uncertainty and risk.
- To design digital solutions students need to understand the complexity of information and digital systems and the interdependence of components.

# Science: Overarching ideas

- Patterns, order and organisation
- Form and function
- Stability and change
- Scale and measurement
- Matter and energy
- Systems

http://www.australiancurriculum.edu.au/Science/The-overarching-ideas

# Why a systems approach?

Systems thinking supports students to learn science as connected concepts, rather than a collection of facts

> Scientific literacy should be approached not as a *collection* of isolated abilities and bits of information, but as a rich *fabric* of mutually supporting ideas. (AAAS, 2001)

# Opportunity for integration: Engineering principles and systems

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Engineering ‘contextualises mathematics and science principles and promotes design processes, but can also enrich students’ learning in their studies of technology, literacy, history and geography.’
(English et al, 2013: 2)

| Design and Technologies: engineering principles and systems | Science: physical sciences |
| --- | --- |
| Explore how technologies use forces to create movement in products (ACTDEK002 | The way objects move depends on a variety of factors, including their size and shape (ACSSU005) A push or a pull affects how an object moves or changes shape (ACSSU033) |
| Investigate how forces and the properties of materials affect the behaviour of a product or system (ACTDEK011) | Forces can be exerted by one object on another through direct contact or from a distance (ACSSU076) |
| Investigate how forces or electrical energy can control movement, sound or light in a designed product or system (ACTDEK020) | Electrical circuits provide a means of transferring and transforming electricity (ACSSU097) |
| Analyse how motion, force and energy are used to manipulate and control electromechanical systems when designing simple, engineered solutions (ACTDEK031) | Change to an object's motion is caused by unbalanced forces acting on the object (ACSSU117) Energy appears in different forms including movement (kinetic energy), heat and potential energy, and causes change within systems (ACSSU155) |
| Investigate and make judgments on how the characteristics and properties of materials are combined with force, motion and energy to create engineered solutions | The motion of objects can be described and predicted using the laws of physics (ACSSU229 |

# Connections

- Australian Curriculum connections
- Re-engineering Australia - Future Submarine Technology Challenge
- EngQuest/Engineers Australia
- CSIRO mentors

# Do *you* follow?

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