



Technological Practice

## Level One

### Planning for practice

- Outline a general plan to support the development of an outcome, identifying appropriate steps and resources.

### Brief development

- Describe the outcome they are developing and identify the attributes it should have, taking account of the need/opportunity and the resources available.

### Outcome development and evaluation

- Undertake research in order to present potential outcomes. Evaluate these in order to select and develop an outcome in keeping with the identified attributes.

## Level Two

### Planning for practice

- Develop a plan that identifies the key stages and the resources required to complete an outcome.

### Brief development

- Explain the outcome they are developing and describe the attributes it should have, taking account of the need/opportunity and the resources available.

### Outcome development and evaluation

- Undertake research to develop ideas for potential outcomes, trial and evaluate these against the identified attributes, and select and develop an outcome.

## Level Three

### Planning for practice

- Undertake planning to identify the key stages and resources required to complete an outcome. This planning will include reviews of progress and identification of implications for subsequent decision making.

### Brief development

- Describe the nature of an intended outcome, explaining how it addresses the need/opportunity. Describe the key attributes that enable development and evaluation of an outcome.

### Outcome development and evaluation

- Undertake research to develop ideas for potential outcomes. Trial and evaluate these in order to select and develop an outcome that addresses the key attributes.

Nature of Technology

### Characteristics of technology

- Understand that technology is purposeful intervention through design.

### Characteristics of technological outcomes

- Understand that technological outcomes are products/systems developed by people and have a physical nature and a functional nature.

### Characteristics of technology

- Understand that technology both reflects and changes society, and increases people's capability.

### Characteristics of technological outcomes

- Understand that technological outcomes are developed through technological practice and have related physical and functional natures.

### Characteristics of technology

- Understand how society impacts on and is influenced by technology in historical and contemporary contexts and that technological knowledge is validated by successful function.

### Characteristics of technological outcomes

- Understand that technological outcomes are recognisable as fit for purpose by the relationship between their physical and functional natures.

Technological Knowledge

### Technological modelling

- Understand that functional models are used to represent reality and test design concepts and that prototypes are used to test technological outcomes.

### Technological products

- Understand that technological products have material and performance properties.

### Technological systems

- Understand that technological systems have inputs, controlled transformations, and outputs.

### Technological modelling

- Understand that functional models are used to explore, test, and evaluate design concepts for potential technological outcomes and that prototyping is used to test a technological outcome for fitness of purpose.

### Technological products

- Understand that there is a relationship between the material and performance properties of technological products.

### Technological systems

- Understand that there are relationships between inputs, controlled transformations, and outputs occurring within simple technological systems.

### Technological modelling

- Understand that different forms of functional modelling are used to inform decision making in the development of technological possibilities and that prototypes can be used to evaluate the fitness of technological outcomes for further development.

### Technological products

- Understand the relationship between the material and performance properties of technological products.

### Technological systems

- Understand that technological systems are represented by symbolic language tools and understand the role played by the 'black box' in technological systems.

## Level Four

**Planning for practice**

- Undertake planning that includes reviewing the effectiveness of past actions and resourcing, exploring implications for future actions and accessing of resources, and accessing stakeholder feedback, in order to ensure the development of an outcome to completion.

**Brief development**

- Justify the nature of an intended outcome in relation to the need/opportunity. Describe the key attributes identified in stakeholder feedback, which will inform the development of an outcome and its evaluation.

**Outcome development and evaluation**

- Undertake research to develop ideas for feasible outcomes. Undertake trialling and evaluation that takes account of stakeholder feedback in order to select and develop the outcome that best addresses the key attributes.

**Characteristics of technology**

- Understand how technological development expands human possibilities and how technology draws on knowledge from a wide range of disciplines.

**Characteristics of technological outcomes**

- Understand that technological outcomes can be interpreted in terms of how they might be used and by whom and that each has a proper function as well as possible alternative functions.

**Technological modelling**

- Understand how different forms of functional modelling are used to explore possibilities and to justify decision making, and how prototyping can be used to justify refinement of technological outcomes.

**Technological products**

- Understand that materials can be formed, manipulated and/or transformed to enhance the fitness for purpose of a technological product.

**Technological systems**

- Understand how technological systems employ control to allow for the transformation of inputs to outputs.

## Level Five

**Planning for practice**

- Analyse their own and others' planning practices to inform the selection and use of planning tools. Use these to support and justify planning decisions (including those relating to the management of resources) that will see the development of an outcome through to completion.

**Brief development**

- Justify the nature of an intended outcome in relation to the need/opportunity. Describe specifications that reflect key stakeholder feedback and which will inform the development of an outcome and its evaluation.

**Outcome development and evaluation**

- Analyse their own and others' outcomes to inform the development of ideas for feasible outcomes. Undertake ongoing experimentation and evaluation that takes account of key stakeholder feedback and trialling in the physical and social environments. Use the information gained to select and develop the outcome that best addresses the specifications.

**Characteristics of technology**

- Understand how people's perceptions and acceptance of technology impact on technological developments and how and why technological knowledge becomes codified.

**Characteristics of technological outcomes**

- Understand that technological outcomes are fit for purpose in terms of time and context and understand the concept of malfunction.

**Technological modelling**

- Understand how evidence, reasoning, and decision making in functional modelling contribute to the development of design concepts, and how prototyping can be used to justify ongoing refinement of technological outcomes.

**Technological products**

- Understand how materials are selected, based on desired performance criteria.

**Technological systems**

- Understand the properties of subsystems within technological systems.

## Level Six

**Planning for practice**

- Critically analyse their own and others' past and current planning practices in order to make informed selection and effective use of planning tools. Use these to support and justify ongoing planning that will see the development of an outcome through to completion.

**Brief development**

- Justify the nature of an intended outcome in relation to the need/opportunity and justify specifications in terms of key stakeholder feedback and wider community considerations. Specifications inform the development of an outcome and its evaluation.

**Outcome development and evaluation**

- Critically analyse their own and others' outcomes to inform the development of ideas for feasible outcomes. Undertake ongoing experimentation and evaluation, taking account of key and wider community stakeholder feedback and trialling in the physical and social environments. Use the information gained to select, develop, and justify the outcome that best addresses the specifications.

**Characteristics of technology**

- Understand the interdisciplinary nature of technology and the implications of this for maximising possibilities through collaborative practice.

**Characteristics of technological outcomes**

- Understand that some technological outcomes can be perceived as both product and system and understand how technological outcomes impact on other technological outcomes and technological practices and on people's views of themselves and possible futures.

**Technological modelling**

- Understand the role and nature of evidence and reasoning when understanding and managing risk through technological modelling.

**Technological products**

- Understand how materials are formed, manipulated and transformed in different ways, depending on their properties, and understand the role of material testing in determining suitability for use in product development.

**Technological systems**

- Understand the implications of subsystems for the design, development, and maintenance of technological systems.

## Level Seven

## Level Eight

### Technological Practice

#### Planning for practice

- Critically analyse their own and others' past and current planning and management practices in order to develop and employ project management practices that will ensure the effective development of an outcome to completion.

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- Critically analyse their own and others' past and current planning and management practices in order to develop and employ project management practices that will ensure the efficient development of an outcome to completion.

#### Brief development

- Justify the nature of an intended outcome in relation to the issue to be resolved and justify specifications in terms of key stakeholder feedback and wider community considerations. Specifications inform the development of an outcome and its evaluation.

#### Brief development

- Justify the nature of an intended outcome in relation to the context and the issue to be resolved. Justify specifications in terms of key stakeholder feedback and wider community considerations. Specifications inform the development of an outcome and its evaluation.

#### Outcome development and evaluation

- Critically analyse their own and others' outcomes and evaluative practices to inform the development of ideas for feasible outcomes. Establish and conduct experimentation and critical evaluation, taking account of key and wider community stakeholder feedback and trialling in the physical and social environments. Use the information gained to select, develop, and justify the outcome that best addresses the specifications.

#### Outcome development and evaluation

- Critically analyse their own and others' outcomes and their determination of fitness for purpose in order to inform the development of ideas for feasible outcomes. Establish and conduct experimentation and critical evaluation, taking account of key and wider community stakeholder feedback and trialling in the physical and social environments. Use the information gained to select, develop, and justify the outcome that best fits the purpose as determined by all dimensions of the context.

### Nature of Technology

#### Characteristics of technology

- Understand the implications of ongoing contestation and competing priorities for complex and innovative decision making in technological development.

#### Characteristics of technology

- Understand the implications of technology-as-intervention and how interventions have consequences, known and unknown, intended and unintended.

#### Characteristics of technological outcomes

- Understand that technological outcomes are a resolution of form and function priorities and that malfunction impacts on people's views of and acceptance of technological outcomes.

#### Characteristics of technological outcomes

- Understand how technological outcomes can be interpreted and justified as fit for purpose in their historical, cultural, social, and geographical locations.

### Technological Knowledge

#### Technological modelling

- Understand how the 'should' and 'could' decisions in technological modelling rely on an understanding of how evidence can change in value across contexts, and how different tools are used to ascertain and mitigate risk.

#### Technological modelling

- Understand the role of technological modelling as a key part of technological development, justifying its importance on moral, ethical, sustainable, cultural, political, economic, and historical grounds.

#### Technological products

- Understand the concepts and processes employed in materials testing and the implications of these for design, development, maintenance, and disposal of technological products.

#### Technological products

- Understand the concepts and processes employed in materials development and the implications of these for design, development, maintenance, and disposal of technological products.

#### Technological systems

- Understand the concepts of redundancy and reliability and their implications for the design, development, and maintenance of technological systems.

#### Technological systems

- Understand operational parameters and their role in the design, development, and maintenance of technological systems.