

# Design 2019 v1.2

## General Senior Syllabus

This syllabus is for implementation with Year 11 students in 2019.

# Contents

<b>1</b>	<b>Course overview</b>	<b>1</b>
1.1	Introduction	1
1.1.1	Rationale	1
1.1.2	Learning area structure	2
1.1.3	Course structure	3
1.2	Teaching and learning	4
1.2.1	Syllabus objectives	4
1.2.2	Underpinning factors	5
1.2.3	Aboriginal perspectives and Torres Strait Islander perspectives	8
1.2.4	Pedagogical and conceptual frameworks	10
1.2.5	Subject matter	15
1.3	Assessment — general information	15
1.3.1	Formative assessments — Units 1 and 2	15
1.3.2	Summative assessments — Units 3 and 4	16
1.4	Reporting standards	17
<b>2</b>	<b>Unit 1: Design in practice</b>	<b>19</b>
2.1	Unit description	19
2.2	Unit objectives	19
2.3	Topic 1: Experiencing design	20
2.4	Topic 2: Design process	22
2.5	Topic 3: Design styles	24
2.6	Assessment guidance	25
<b>3</b>	<b>Unit 2: Commercial design</b>	<b>26</b>
3.1	Unit description	26
3.2	Unit objectives	26
3.3	Topic 1: Explore — client needs and wants	27
3.4	Topic 2: Develop — collaborative design	29
3.5	Assessment guidance	30
<b>4</b>	<b>Unit 3: Human-centred design</b>	<b>31</b>
4.1	Unit description	31
4.2	Unit objectives	31
4.3	Topic 1: Designing with empathy	32
4.4	Assessment	34
4.4.1	Summative internal assessment 1 (IA1): Examination — design challenge (15%)	34
4.4.2	Summative internal assessment 2 (IA2): Project (35%)	37

<b>5</b>	<b>Unit 4: Sustainable design</b>	<b>42</b>
5.1	Unit description.....	42
5.2	Unit objectives .....	42
5.3	Topic 1: Explore — sustainable design opportunities .....	43
5.4	Topic 2: Develop — redesign .....	44
5.5	Assessment.....	46
5.5.1	Summative internal assessment 3 (IA3): Project (25%).....	46
5.5.2	Summative external assessment (EA): Examination — design challenge (25%).....	51
<b>6</b>	<b>Glossary</b>	<b>53</b>
<b>7</b>	<b>References</b>	<b>80</b>
<b>8</b>	<b>Version history</b>	<b>81</b>

# 1 Course overview

## 1.1 Introduction

### 1.1.1 Rationale

Technologies have been an integral part of society for as long as humans have had the desire to create solutions to improve their own and others' quality of life. Technologies have an impact on people and societies by transforming, restoring and sustaining the world in which we live.

Australia needs enterprising and innovative individuals with the ability to make discerning decisions concerning the development, use and impact of technologies. When developing technologies, these individuals need to be able to work independently and collaboratively to solve complex, open-ended problems. Subjects in the Technologies learning area prepare students to be effective problem-solvers as they learn about and work with contemporary and emerging technologies.

The Design subject focuses on the application of design thinking to envisage creative products, services and environments in response to human needs, wants and opportunities. Designing is a complex and sophisticated form of problem-solving that uses divergent and convergent thinking strategies that can be practised and improved. Designers are separated from the constraints of production processes to allow them to appreciate and exploit innovative ideas.

In Unit 1, students will be introduced to design in practice through the experience of applying a design process. In Unit 2, students will learn about and experience designing in the context of commercial design, considering the role of the client and the influence of economic, social and cultural issues. They will use a collaborative design approach. In Unit 3, students will learn about and experience designing in the context of human-centred design. They will use designing with empathy as an approach as they design for the needs and wants of an identified person or group. In Unit 4, students will learn about and experience designing in the context of sustainable design. They will use a redesigning approach to design for an opportunity.

The teaching and learning approach uses a design process grounded in the problem-based learning framework. This approach enables students to learn about and experience design through exploring needs, wants and opportunities; developing ideas and design concepts; using drawing and low-fidelity prototyping skills; and evaluating ideas and design concepts. Students communicate design proposals to suit different audiences.

Students will learn how design has influenced the economic, social and cultural environment in which they live. They will understand the agency of humans in conceiving and imagining possible futures through design. Students will develop valuable 21st century skills in critical thinking, creative thinking, communication, collaboration and teamwork, personal and social skills, and information & communication technologies (ICT) skills. Collaboration, teamwork and communication are crucial skills needed to work in design teams and liaise with stakeholders. The design thinking students learn is broadly applicable to a range of professions and supports the development of critical and creative thinking.

Students will develop an appreciation of designers and their role in society. They will learn the value of creativity and build resilience as they experience iterative design processes, where the best ideas may be the result of trial and error and a willingness to take risks and experiment with alternatives. Design equips students with highly transferrable, future-focused thinking skills relevant to a global context.

## Assumed knowledge, prior learning or experience

Students will have prior knowledge of the Australian Curriculum: Technologies, which is core in Years 7 and 8.

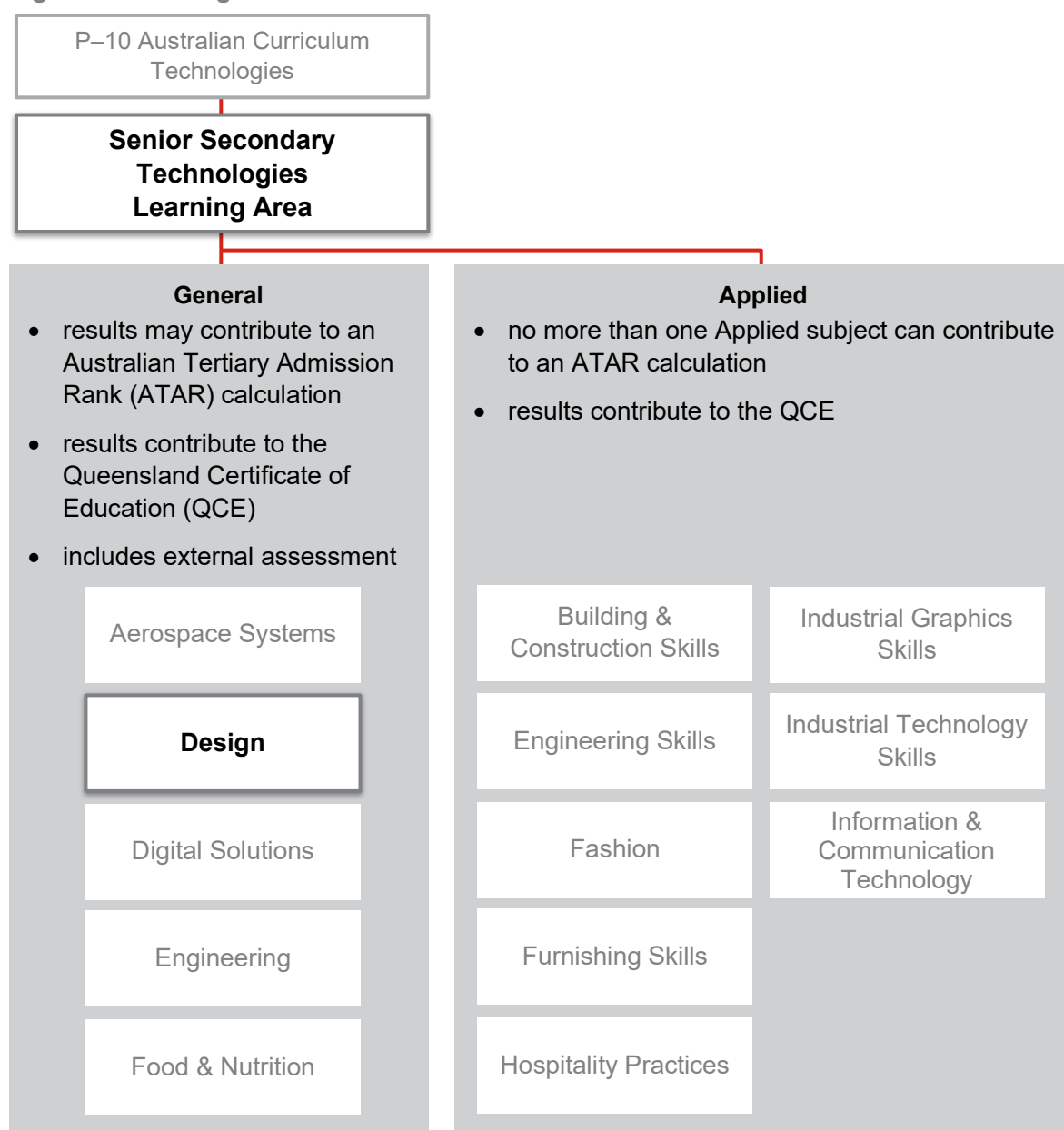
## Pathways

Design is a General subject suited to students who are interested in pathways beyond school that lead to tertiary studies, vocational education or work. A course of study in Design can establish a basis for further education and employment in the fields of architecture, digital media design, fashion design, graphic design, industrial design, interior design and landscape architecture.

### 1.1.2 Learning area structure

All learning areas build on the P–10 Australian Curriculum.

Figure 1: Learning area structure



### 1.1.3 Course structure

Design is a course of study consisting of four units. Subject matter, learning experiences and assessment increase in complexity from Units 1 and 2 to Units 3 and 4 as students develop greater independence as learners.

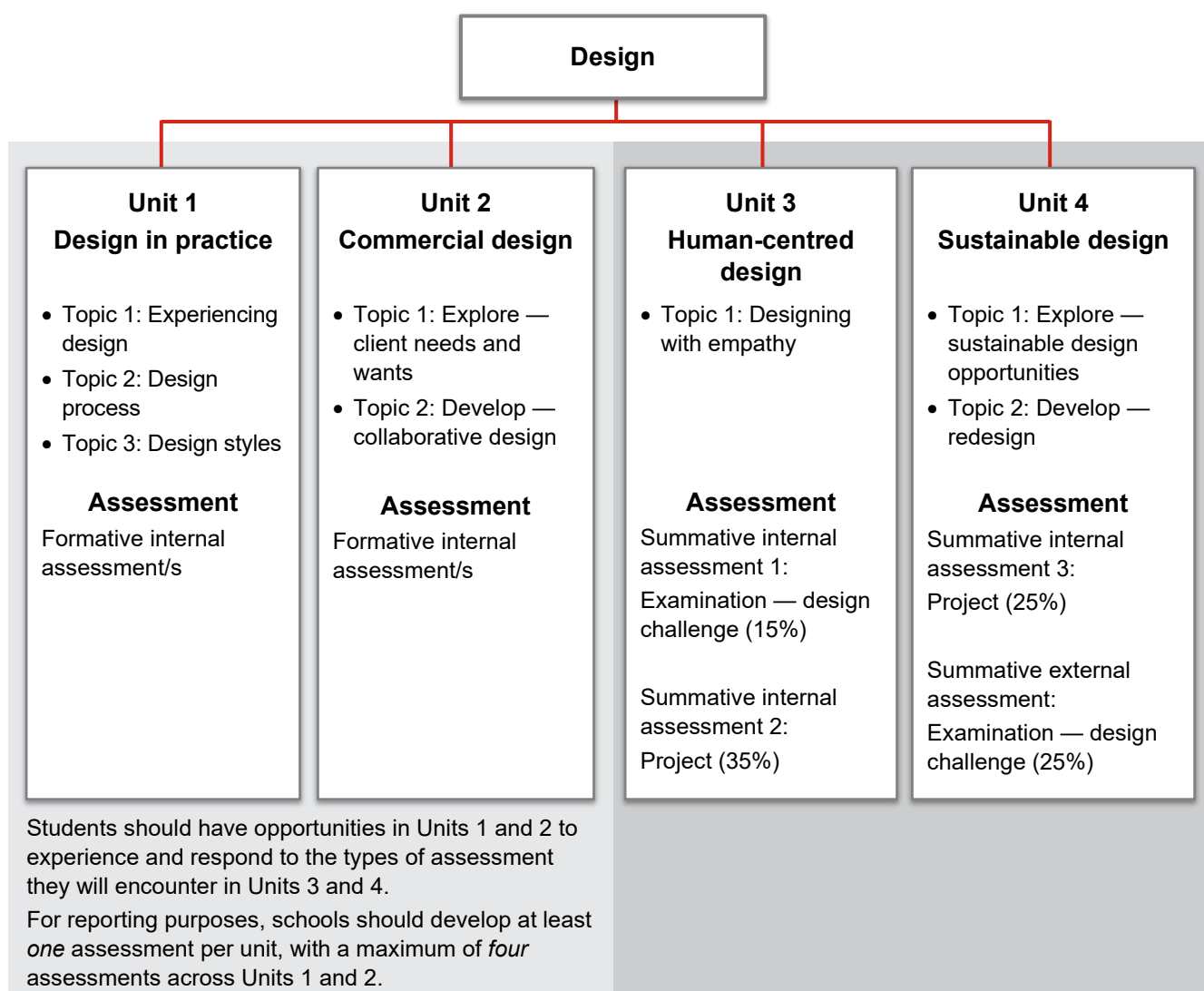
Units 1 and 2 provide foundational learning, which allows students to experience all syllabus objectives and begin engaging with the course subject matter. Students should complete Units 1 and 2 before beginning Unit 3. It is recommended that Unit 3 be completed before Unit 4.

Units 3 and 4 consolidate student learning. Only the results from Units 3 and 4 will contribute to ATAR calculations.

Figure 2 outlines the structure of this course of study.

Each unit has been developed with a notional time of 55 hours of teaching and learning, including assessment.

Figure 2: Course structure



## 1.2 Teaching and learning

### 1.2.1 Syllabus objectives

The syllabus objectives outline what students have the opportunity to learn. Assessment provides evidence of how well students have achieved the objectives.

Syllabus objectives inform unit objectives, which are contextualised for the subject matter and requirements of the unit. Unit objectives, in turn, inform the assessment objectives, which are further contextualised for the requirements of the assessment instruments. The number of each objective remains constant at all levels, i.e. Syllabus objective 1 relates to Unit objective 1 and to Assessment objective 1 in each assessment instrument.

Syllabus objectives are described in terms of actions that operate on the subject matter. Students are required to use a range of cognitive processes in order to demonstrate and meet the syllabus objectives. These cognitive processes are described in the explanatory paragraph following each objective in terms of four levels: retrieval, comprehension, analytical processes (analysis), and knowledge utilisation, with each process building on the previous processes (see Marzano & Kendall 2007, 2008). That is, comprehension requires retrieval, and knowledge utilisation requires retrieval, comprehension and analytical processes (analysis).

By the conclusion of the course of study, students will:

Syllabus objective	Unit 1	Unit 2	Unit 3	Unit 4
1. <u>describe design problems and design criteria</u>	•	•	•	•
2. <u>represent ideas, design concepts and design information using drawing and low-fidelity prototyping</u>	•	•	•	•
3. <u>analyse</u> needs, wants and opportunities using data	•	•	•	•
4. <u>devise</u> ideas in response to design problems	•	•	•	•
5. <u> synthesise</u> ideas and design information to propose design concepts	•	•	•	•
6. <u>evaluate</u> ideas and design concepts to make refinements	•	•	•	•
7. <u>make decisions</u> about and use mode-appropriate features, language and conventions for particular purposes and contexts.	•	•	•	•

#### 1. describe design problems and design criteria

When students describe, they give an account of the aesthetic, cultural, economic, social and technical features related to stakeholders' requirements that define problems. When students describe design criteria, they state stakeholders' requirements and the principles of good design that will be used to judge the quality of ideas and design concepts.

#### 2. represent ideas, design concepts and design information using drawing and low-fidelity prototyping

When students represent, they use visualisation skills of schematic sketching, ideation sketching and low-fidelity prototyping to comprehend ideas, design concepts and design information in the explore and develop phases of the design process. They differentiate between critical and non-critical elements to progress their understanding using sequences of representations.

### 3. analyse needs, wants and opportunities using data

When students analyse, they examine design opportunities and stakeholders' needs and wants. They use primary data about stakeholders and secondary data about existing designs to identify aesthetic, cultural, economic, social and technical features, the relationships between them and the reasonableness of information.

### 4. devise ideas in response to design problems

When students devise, they use divergent thinking strategies in the develop phase of the design process to think out and invent creative ideas. Ideas are thoughts or suggestions of possible ways of responding to design problems.

### 5. synthesise ideas and design information to propose design concepts

When students synthesise, they use convergent thinking strategies in the develop phase of the design process to combine the attributes of multiple ideas and design information to propose design concepts. Design concepts represent possible designed solutions to design problems.

### 6. evaluate ideas and design concepts to make refinements

When students evaluate, they judge the extent to which ideas and design concepts meet design criteria. They make judgments about strengths, limitations and implications. When students make refinements, they improve ideas and design concepts based on the evaluation.

### 7. make decisions about and use mode-appropriate features, language and conventions for particular purposes and contexts

When students make decisions about mode-appropriate features, language and conventions, they use visual, written and spoken features to express meaning for particular purposes in a range of design experiences. Visual communication includes schematic, ideation and illustration drawings, photographs, motion graphics and low-fidelity prototypes. Visual features include the elements and principles of visual communication. Written communication includes language conventions, specific vocabulary and language features such as notes, paragraphs and sentences. Spoken communication includes verbal and nonverbal features and may be for live or virtual audiences. Students use referencing conventions to practise ethical scholarship for particular purposes.

## 1.2.2 Underpinning factors

There are three skill sets that underpin senior syllabuses and are essential for defining the distinctive nature of subjects:

- literacy — the set of knowledge and skills about language and texts essential for understanding and conveying Design content
- numeracy — the knowledge, skills, behaviours and dispositions that students need to use mathematics in a wide range of situations, to recognise and understand the role of mathematics in the world, and to develop the dispositions and capacities to use mathematical knowledge and skills purposefully
- 21st century skills — the attributes and skills students need to prepare them for higher education, work and engagement in a complex and rapidly changing world.

These skill sets, which overlap and interact, are derived from current education, industry and community expectations and encompass the knowledge, skills, capabilities, behaviours and dispositions that will help students live and work successfully in the 21st century.



Together these three skill sets shape the development of senior subject syllabuses. Although coverage of each skill set may vary from syllabus to syllabus, students should be provided with opportunities to learn through and about these skills over the course of study. Each skill set contains identifiable knowledge and skills that can be directly assessed.

## Literacy in Design

Students develop literacy knowledge and skills as they:

- communicate information, ideas, and design concepts to a variety of audiences
- read and interpret detailed written information, including stakeholder requirements, diagrams, tables of data and design briefs
- develop annotated sketches and drawings
- write notes, briefs, lists and evaluations.

Design requires students to develop literacy skills that facilitate the effective communication of design information and presentation of design proposals. Students organise and manipulate information in logical sequence using visual, spoken and written modes to convey meaning to particular audiences for specific purposes. Students develop and enhance this capacity through their learning experiences. Students improve their ability to use knowledge of visual and language conventions as they progress through the course of study.

These aspects of literacy knowledge and skills are embedded in the syllabus objectives, unit objectives and subject matter, and instrument-specific marking guides (ISMGs) for Design.

## Numeracy in Design

The study of Design requires students to use and enhance their knowledge of mathematics and develop their visual–spatial ability. Students:

- develop their ability to comprehend basic concepts and terms underpinning the areas of number, space, probability, statistics and measurement
- extract, convert or translate information given in numerical forms or as diagrams, maps, graphs or tables
- use graphical methods based on mathematical models to represent objects.

These aspects of numeracy knowledge and skills are embedded in the syllabus objectives, unit objectives and subject matter, and ISMGs for Design.

## 21st century skills

The 21st century skills identified in this syllabus reflect a common agreement, both in Australia and internationally, on the skills and attributes students need to prepare them for higher education, work and engagement in a complex and rapidly changing world.

21st century skills	Associated skills	21st century skills	Associated skills
critical thinking	<ul style="list-style-type: none"> <li>• analytical thinking</li> <li>• problem-solving</li> <li>• decision-making</li> <li>• reasoning</li> <li>• reflecting and evaluating</li> <li>• intellectual flexibility</li> </ul>	creative thinking	<ul style="list-style-type: none"> <li>• innovation</li> <li>• initiative and enterprise</li> <li>• curiosity and imagination</li> <li>• creativity</li> <li>• generating and applying new ideas</li> <li>• identifying alternatives</li> <li>• seeing or making new links</li> </ul>
communication	<ul style="list-style-type: none"> <li>• effective oral and written communication</li> <li>• using language, symbols and texts</li> <li>• communicating ideas effectively with diverse audiences</li> </ul>	collaboration and teamwork	<ul style="list-style-type: none"> <li>• relating to others (interacting with others)</li> <li>• recognising and using diverse perspectives</li> <li>• participating and contributing</li> <li>• community connections</li> </ul>
personal and social skills	<ul style="list-style-type: none"> <li>• adaptability/flexibility</li> <li>• management (self, career, time, planning and organising)</li> <li>• character (resilience, mindfulness, open- and fair-mindedness, self-awareness)</li> <li>• leadership</li> <li>• citizenship</li> <li>• cultural awareness</li> <li>• ethical (and moral) understanding</li> </ul>	information & communication technologies (ICT) skills	<ul style="list-style-type: none"> <li>• operations and concepts</li> <li>• accessing and analysing information</li> <li>• being productive users of technology</li> <li>• digital citizenship (being safe, positive and responsible online)</li> </ul>

Design helps develop the following 21st century skills:

- critical thinking
  - problem-solving using the design process
  - decision-making by making informed choices
  - intellectual flexibility by being open to alternative ideas and new learning
  - evaluating with purpose against criteria
- creative thinking
  - devising new ideas in response to design problems
  - using innovation to identify new ways of doing things and opportunities to reimagine products, services and environments
  - demonstrating initiative and enterprise to be self-directed in learning and designing
  - demonstrating curiosity and imagination to motivate learning in design processes

- synthesising ideas and information to propose design concepts
- making refinements to improve ideas and design concepts
- communication
  - using effective visual, oral and written communication; using images, symbols, language and texts; communicating ideas effectively with diverse audiences
  - manipulating and using specialised language, terminology, drawing and low-fidelity prototyping to represent ideas and information in design processes
- collaboration and teamwork
  - relating and interacting with stakeholders and other designers when designing
  - recognising and using diverse perspectives when understanding aesthetic, economic, social, cultural, sustainable and technical influences on design
  - participating and contributing to create personal, team and community connections
- personal and social skills
  - developing personal, social, ethical, moral, economic and legal understandings in design
  - demonstrating adaptability and flexibility to devise ideas
  - developing the ability to self-manage (self, time, planning and organising) during design processes
  - developing and enhancing the personal characteristics of resilience, mindfulness, open- and fair-mindedness, and self-awareness during design processes
- information & communication technologies (ICT) skills
  - accessing, collating, evaluating, analysing and presenting information from primary and secondary sources
  - being productive users of technology to manipulate digital information using digital technologies.

These elements of 21st century skills are embedded in the syllabus objectives, unit objectives and subject matter, and ISMGs for Design.

### 1.2.3 Aboriginal perspectives and Torres Strait Islander perspectives

The QCAA is committed to reconciliation in Australia. As part of its commitment, the QCAA affirms that:

- Aboriginal peoples and Torres Strait Islander peoples are the first Australians, and have the oldest living cultures in human history
- Aboriginal peoples and Torres Strait Islander peoples have strong cultural traditions and speak diverse languages and dialects, other than Standard Australian English
- teaching and learning in Queensland schools should provide opportunities for students to deepen their knowledge of Australia by engaging with the perspectives of Aboriginal peoples and Torres Strait Islander peoples
- positive outcomes for Aboriginal students and Torres Strait Islander students are supported by successfully embedding Aboriginal perspectives and Torres Strait Islander perspectives across planning, teaching and assessing student achievement.

Guidelines about Aboriginal perspectives and Torres Strait Islander perspectives and resources for teaching are available at [www.qcaa.qld.edu.au/k-12-policies/aboriginal-torres-strait-islander-perspectives](http://www.qcaa.qld.edu.au/k-12-policies/aboriginal-torres-strait-islander-perspectives).

Where appropriate, Aboriginal perspectives and Torres Strait Islander perspectives have been embedded in the subject matter.

Through engagement with Design, Aboriginal students and Torres Strait Islander students are able to see themselves, their identities and their cultures reflected in their designs. In addition, all students will have the opportunity to engage in reconciliation with, respect for and recognition of the world's oldest continuous living culture, and understand the significant contribution of Australia's First Peoples to design, through both contemporary and historical traditions and practices. This understanding helps support learning at the cultural interface, encouraging students to make connections between their own worlds and the worlds of others, build on shared interests and commonalities, and develop insight into and empathy for others as part of a diverse, global community.

Protocols are appropriate ways of interacting with designers, communities and the cultural material of Aboriginal peoples and Torres Strait Islander peoples. Protocols encourage ethical conduct and promote interaction based on respect. The *Australian Indigenous Design Charter: Communication design — Protocols for sharing Indigenous knowledge in communication design practice* (Design Institute of Australia n.d.), available at [www.design.org.au/services/practice-notes](http://www.design.org.au/services/practice-notes), explains protocols in further depth.

The following principles provide guidelines for respecting and working with the designs of Aboriginal peoples and Torres Strait Islander peoples.

Teachers should:

- be mindful that there is great diversity among Aboriginal communities and Torres Strait Islander communities. There is not just one Aboriginal culture or one Torres Strait Islander culture — each community has its own unique collection of stories, cultural values, customs and languages
- avoid outdated or inappropriate terminology and perspectives
- allow opportunities for re-interpretation of orthodox historical records through a contemporary context, particularly of representations in historical design forms
- recognise the cultural obligations and ownership of cultural heritage, including Aboriginal peoples' and Torres Strait Islander peoples' body painting, images, motifs, stories and other forms of cultural expression
- consult Aboriginal peoples and Torres Strait Islander peoples on the use and representation of cultural heritage
- consider interpretation, context and integrity when discussing the cultural value of subject matter, styles and imagery, sensitive materials, stereotypes and the use of biographical materials
- understand that Aboriginal peoples and Torres Strait Islander peoples have the right to maintain confidentiality about aspects of their personal and cultural heritage
- acknowledge language groups of designers when attributing designs, cultural sources, images and materials
- discuss issues such as payment, transport and other services when arranging workshops, speaking engagements and interviews with Aboriginal designers and Torres Strait Islander designers

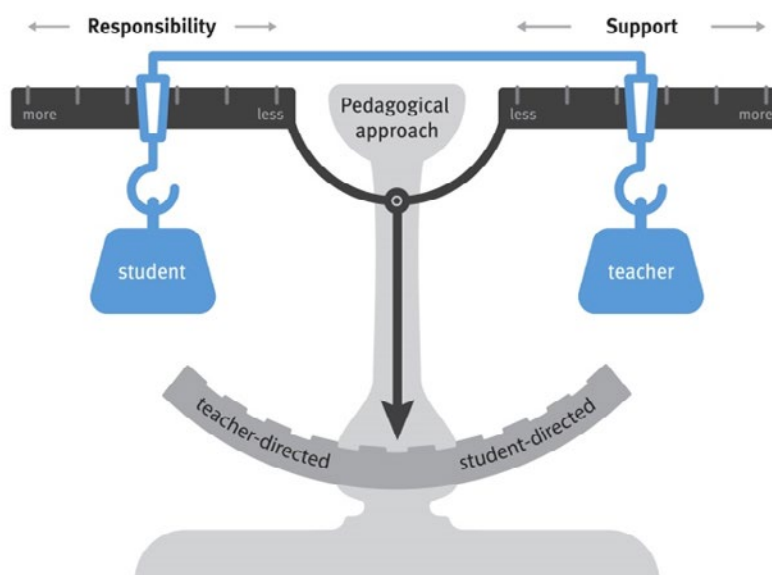
- maintain relationships with Aboriginal designers and Torres Strait Islander designers and communities to ensure that the practice and transmission of Aboriginal and Torres Strait Islander cultural expression is continued for the benefit of future generations
- recognise copyright ownership of designers that gives them control of reproduction and distribution of work, and how this affects the use of imagery and designs in an educational context.

## 1.2.4 Pedagogical and conceptual frameworks

### Problem-based learning framework

In the Technologies learning area, the problem-based learning framework (as represented in Figure 3) provides the overarching pedagogical basis for the implementation of subject-specific problem-solving processes. Problem-based learning places students in real-world situations where they use skills associated with critical thinking, creative thinking, communication, collaboration and teamwork, personal and social interactions and information & communication technologies (ICT) in order to develop solutions that acknowledge personal, social, ethical, economic, environmental, legal and sustainability impacts.

**Figure 3: Problem-based learning framework in the Technologies learning area**



In Design:

- problem-based learning is an active process of knowledge construction that uses open-ended design experiences as stimuli for student learning
- the learning environment is organised to represent the complex nature of the designing, e.g. collaboration using teamwork and brainstorming, as these are strategies used during real-world designing
- the teacher is responsible for scaffolding student learning and cognition during designing as a coach, guide or facilitator to maintain the independence and self-directedness of student learning
- self-directed learning does not mean students are self-taught; instead, teachers balance their participation in student learning so that students maintain responsibility for learning, e.g.

students make decisions about the knowledge and skills they require to effectively design, supported by the teacher's questioning and cueing strategies

- perception of student self-control in the learning process is fundamental to problem-based learning.

## The design process in Design

Design is an iterative process for solving problems. Design problems have competing aesthetic, cultural, economic, social and technical features.

The design process is non-linear. Good design ideas that are innovative, useful, aesthetic, accessible and sustainable do not emerge from a predetermined sequence of inputs and the completion of steps, but through an iterative process of refinement. Designers must be able to manage uncertainty and be prepared to retrace steps, divert to solve sub-problems along the way, or even a return to the start of the process if it becomes clear that the situation needs to be clarified and the problem redefined. The process requires an open mind, risk-taking, the freedom to be creative, and a great deal of patience and persistence.

Design process models are useful tools for understanding and teaching design. Examples include:

- *Design Thinking for Educators* (IDEO 2013)
- *The Field Guide to Human-Centered Design* (IDEO 2015)
- The Stanford d.school *Getting started with design thinking* (Hasso Plattner Institute of Design at Stanford University)
- *The Universal Traveller: A companion for those on problem-solving journeys and a soft-systems guidebook to the process of design* (Koberg & Bagnall 1972)
- *Design Yourself!* (Hanks, Edwards & Belliston 1977)
- *IDESiGN* (Burnette 2013)
- *Design Minds* (Duell et al. 2014)

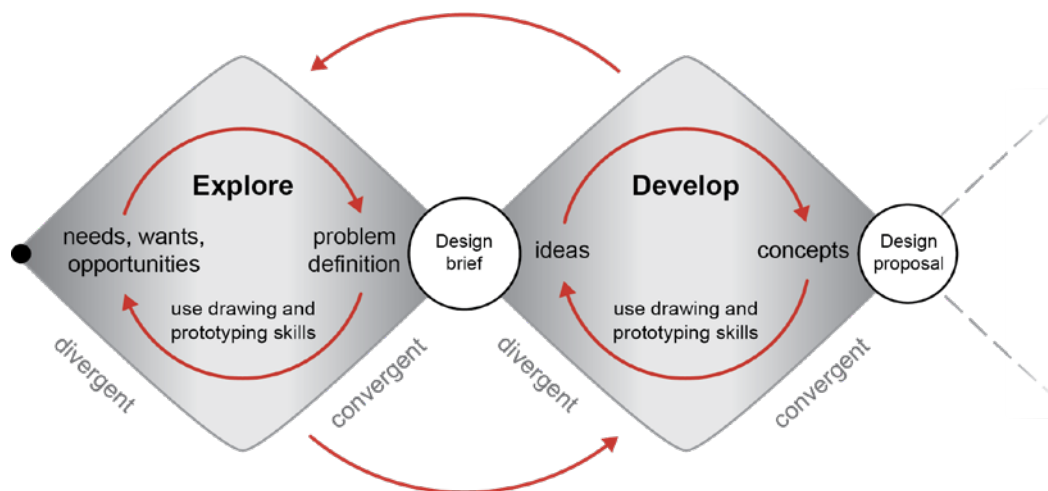
In this syllabus, the design process is represented by a version of the Double Diamond design process (Design Council 2015). This iterative model shows two phases that are critical to the design process — an initial phase of divergent thinking where a broad insight is sought, followed by a phase of convergent thinking where that insight is narrowed and brought into something usable. In design, the first point of convergence defines the problem and the second delivers a design proposal. Figure 4 represents how these phases inform the design process in the four units of the Design syllabus. The phases involve exploring and developing, with communication to stakeholders required at each of the points of convergence.

The design process is initiated by teachers who will:

- provide stimulus for an exploration, e.g. guiding question, case study, stakeholder information, visual stimulus
- structure the learning to allow students to engage with the design process appropriate to the stage of the course defined in the unit requirements
- identify the context relevant to the unit, e.g. commercial design, human-centred design, sustainable design
- identify the design approach relevant to the unit, e.g. collaborative designing, designing with empathy, redesigning

- identify constraints, e.g. available time, legalities.

**Figure 4: The design process in Design**



### Explore

To explore, students:

- identify stakeholders
- identify a need, want or opportunity
- analyse needs, wants or opportunities using primary and secondary data to identify features
- use drawing and low-fidelity prototyping skills to represent information.

At the conclusion of the explore phase, students define a design problem that:

- relates to the real world
- is open-ended with no single correct answer
- identifies stakeholders
- relates to a need, want or opportunity
- is described by
  - aesthetic, cultural, economic, social and technical features related to stakeholders' requirements
  - constraints, e.g. teacher specified available time, physical realities, legalities
- is accompanied by design criteria that can be used to judge the quality of ideas and design concepts. Design criteria are based on
  - stakeholders' requirements
  - the principles of good design
- requires ideas and design concepts to be developed and a design proposal to be communicated to stakeholders
- is described in a succinct written design brief with a list of design criteria.

### Develop



To develop, students:

- devise multiple ideas using divergent thinking in response to the design problem
- use drawing and low-fidelity prototyping skills appropriate to the nature of the problem to visually represent and think through ideas and design concepts
- use convergent thinking to synthesise the attributes from multiple ideas and design information to propose possible design concepts
- evaluate the extent to which ideas and design concepts meet design criteria to make improvements
- make a decision about a design concept that best meets the design criteria.

At the conclusion of the develop phase, students communicate a design proposal to stakeholders that:

- is prepared to communicate the evaluation of the selected design concept to stakeholders
- visually represents the design concept in the form that best communicates the attributes of the design for the audience. This may include illustrations and/or low-fidelity prototypes
- is supported by written and/or spoken information.

### Drawing and prototyping skills

Throughout the design process, students use drawing and prototyping skills to visually represent ideas, design concepts and design information. The categories of drawing and prototyping skills (see Table 1) used are:

- schematic
- ideation
- illustration
- low-fidelity prototype.

**Table 1: Drawing and prototyping skills**

Category	Description	Examples
<b>schematic</b> <ul style="list-style-type: none"><li>• informal drawings, usually produced using manual freehand techniques, but may be software assisted</li></ul>	<ul style="list-style-type: none"><li>• an abstract representation that aids in the conceptualisation of relationships between <u>design information</u> and aspects of ideas; schematic sketches may be used to record and analyse knowledge and data</li></ul>	<ul style="list-style-type: none"><li>• <u>diagram</u></li><li>• <u>mind map</u></li><li>• <u>empathy map</u></li><li>• <u>functional relationships diagram</u></li><li>• <u>flow chart</u></li><li>• <u>website architecture diagram</u></li></ul>
<b>ideation</b> <ul style="list-style-type: none"><li>• informal drawings, usually produced using manual freehand techniques, but may be software assisted</li></ul>	<ul style="list-style-type: none"><li>• representations of mental images that aid in the exploration and development of ideas; such sketches may be very informal and conceptual or relatively accurate, but their purpose is the rapid devising and testing of ideas</li></ul>	<ul style="list-style-type: none"><li>• <u>pictorial sketch</u></li><li>• <u>aerial view</u></li><li>• <u>idea sketch</u></li><li>• <u>study sketch</u></li><li>• <u>layout</u></li><li>• <u>sketch plan</u></li></ul>



Category	Description	Examples
<p>illustration</p> <ul style="list-style-type: none"> <li>may be produced using manual freehand techniques or software assisted techniques</li> </ul>	<ul style="list-style-type: none"> <li>a pictorial simulation of the appearance of an object as it would be seen by an observer who looks from a selected point of view; often used to communicate a refined design concept</li> </ul>	<ul style="list-style-type: none"> <li>line drawing</li> <li>rendered sketch</li> <li>explanatory sketch</li> <li>perspective sketch</li> <li>isometric sketch</li> <li>photograph</li> </ul>
	<ul style="list-style-type: none"> <li>orthographic views of a 3D object projected onto 2D planes; often used to communicate a refined design concept</li> </ul>	<ul style="list-style-type: none"> <li>plans</li> <li>elevations</li> <li>sections</li> <li>developments/nets</li> <li>patterns</li> <li>flat drawings</li> </ul>
<p>low-fidelity prototype</p> <ul style="list-style-type: none"> <li>may be produced using physical and/or digital techniques; the outcome may include a combination of physical and digital attributes</li> </ul>	<ul style="list-style-type: none"> <li>interactive or sequential experiences produced by ICT software that allow ideas and design concepts to be tested</li> </ul>	<ul style="list-style-type: none"> <li>interface wireframe</li> <li>website simulation</li> <li>mobile application simulation</li> <li>virtual reality</li> <li>augmented reality</li> <li>three-dimensional digital model</li> <li>digital presentation</li> <li>video with or without audio (sounds, music, dialogue)</li> <li>walk-throughs of environments</li> <li>short video loops</li> <li>animated information graphics</li> <li>animation</li> </ul>
	<ul style="list-style-type: none"> <li>3D objects; generated by cutting, joining and forming materials such as card, clay, metal, paper, plastic, textile and wood; used to rapidly represent the form of ideas and design concepts to aid understanding; representations are informal and conceptual</li> </ul>	<ul style="list-style-type: none"> <li>junk model</li> <li>form study</li> <li>proof of concept</li> <li>massing models</li> <li>scale models</li> <li>mock-ups</li> <li>sculpture</li> <li>test rigs</li> <li>maquette</li> <li>appearance models</li> <li>toile</li> </ul>

## 1.2.5 Subject matter

Subject matter is the body of information, mental procedures and psychomotor procedures (see Marzano & Kendall 2007, 2008) that are necessary for students' learning and engagement with Design. It is particular to each unit in the course of study and provides the basis for student learning experiences.

Subject matter has a direct relationship to the unit objectives, but is of a finer granularity and is more specific. These statements of learning are constructed in a similar way to objectives. Each statement:

- describes an action (or combination of actions) — what the student is expected to do
- describes the element — expressed as information, mental procedures and/or psychomotor procedures
- is contextualised to the topic or circumstance particular to the unit.

Each of the units in Design has a particular design context and approach with associated knowledge and design skills. The units are structured to provide students with the opportunity to learn through a range of practical design experiences across the four units. Teachers provide design experiences to suit the design context, approach, subject matter and the degree of student-directed designing required in each unit.

## 1.3 Assessment — general information

Assessments are formative for Units 1 and 2, and summative for Units 3 and 4.

Assessment	Unit 1	Unit 2	Unit 3	Unit 4
Formative assessments	•	•		
Summative internal assessment 1			•	
Summative internal assessment 2			•	
Summative internal assessment 3				•
Summative external assessment				•

### 1.3.1 Formative assessments — Units 1 and 2

Formative assessments provide feedback to both students and teachers about each student's progress in the course of study.

Schools develop internal assessments for each senior subject based on the learning described in Units 1 and 2 of the subject syllabus. Each unit objective must be assessed at least once.

For reporting purposes, schools should devise at least *two* but no more than *four* assessments for Units 1 and 2 of this subject. At least *one* assessment must be completed for *each* unit.

The sequencing, scope and scale of assessments for Units 1 and 2 are matters for each school to decide and should reflect the local context.

Teachers are encouraged to use the A–E descriptors in the reporting standards (Section 1.4) to provide formative feedback to students and to report on progress.

### 1.3.2 Summative assessments — Units 3 and 4

Students will complete a total of *four* summative assessments — three internal and one external — that count towards their final mark in each subject.

Schools develop *three* internal assessments for each senior subject, based on the learning described in Units 3 and 4 of the syllabus.

The three summative internal assessments will be endorsed and the results confirmed by the QCAA. These results will be combined with a single external assessment developed and marked by the QCAA. The external assessment results for Design will contribute 25% towards a student's result.

#### Summative internal assessment — instrument-specific marking guides

This syllabus provides ISMGs for the three summative internal assessments in Units 3 and 4.

The ISMGs describe the characteristics evident in student responses and align with the identified assessment objectives. Assessment objectives are drawn from the unit objectives and are contextualised for the requirements of the assessment instrument.

#### Criteria

Each ISMG groups assessment objectives into criteria. An assessment objective may appear in multiple criteria, or in a single criterion of an assessment.

#### Making judgments

Assessment evidence of student performance in each criterion is matched to a performance level descriptor, which describes the typical characteristics of student work.

Where a student response has characteristics from more than one performance level, a best-fit approach is used. Where a performance level has a two-mark range, it must be decided if the best fit is the higher or lower mark of the range.

#### Authentication

Schools and teachers must have strategies in place for ensuring that work submitted for internal summative assessment is the student's own. Authentication strategies outlined in the QCAA guidelines, which include guidance for drafting, scaffolding and teacher feedback, must be adhered to.

#### Summative external assessment

The summative external assessment adds valuable evidence of achievement to a student's profile. External assessment is:

- common to all schools
- administered under the same conditions at the same time and on the same day
- developed and marked by the QCAA according to a commonly applied marking scheme.

The external assessment contributes 25% to the student's result in Design. It is not privileged over the school-based assessment.

## 1.4 Reporting standards

Reporting standards are summary statements that succinctly describe typical performance at each of the five levels (A–E). They reflect the cognitive taxonomy and objectives of the course of study.

The primary purpose of reporting standards is for twice-yearly reporting on student progress. These descriptors can also be used to help teachers provide formative feedback to students and to align ISMGs.

### Reporting standards

A
<p>The student, in a range of design experiences, demonstrates <u>discerning</u> description of design problems and <u>essential</u> design criteria, and <u>sophisticated</u> representation of design information using drawing and low-fidelity prototyping.</p> <p>The student demonstrates <u>insightful</u> analysis of needs, wants and opportunities using data.</p> <p>The student demonstrates: <u>perceptive</u> devising of <u>multiple</u> ideas from different points of view — with each idea incorporating unique, credible and detailed attributes — in response to design problems; <u>coherent</u> and <u>logical</u> synthesis of ideas to propose <u>innovative</u> design concepts; <u>critical</u> evaluation of ideas and design concepts to make discerning refinements; discerning decision-making about and <u>fluent</u> use of mode-appropriate features, language and conventions for particular audiences and purposes.</p>
B
<p>The student, in a range of design experiences, demonstrates <u>effective</u> description of design problems and design criteria, and <u>considered</u> representation of design information using drawing and low-fidelity prototyping.</p> <p>The student demonstrates considered analysis of needs, wants and opportunities using data.</p> <p>The student demonstrates: <u>purposeful</u> devising of ideas — with each idea incorporating unique, credible and detailed attributes — in response to design problems; logical synthesis of ideas to propose <u>credible</u> design concepts; <u>reasoned</u> evaluation of ideas and design concepts to make effective refinements; effective decision-making about and <u>proficient</u> use of mode-appropriate features, language and conventions for particular audiences and purposes.</p>
C
<p>The student, in a range of design experiences, demonstrates <u>adequate</u> description of design problems and some design criteria, and appropriate representation of design information using drawing and low-fidelity prototyping.</p> <p>The student demonstrates appropriate analysis of needs, wants and opportunities using data.</p> <p>The student demonstrates: appropriate devising of ideas — with each idea incorporating credible attributes — in response to design problems; <u>simple</u> synthesis of ideas to propose design concepts; <u>feasible</u> evaluation of ideas and design concepts to make adequate refinements; appropriate decision-making about and use of mode-appropriate features, language and conventions for particular purposes and contexts.</p>
D
<p>The student, in a range of design experiences, demonstrates <u>superficial</u> description of design problems and some design criteria, and <u> cursory</u> representation of design information using drawing or low-fidelity prototyping.</p> <p>The student demonstrates superficial analysis of needs, or wants or opportunities.</p> <p>The student demonstrates: superficial devising of ideas in response to design problems; <u>rudimentary</u> synthesis of ideas to propose design concepts; superficial evaluation of ideas or design concepts to make superficial refinements; <u>variable</u> decision-making and <u>inconsistent</u> use of mode-appropriate features, language and conventions for particular purposes and contexts.</p>

## E

The student, in a range of design experiences, demonstrates description of aspects of design problems and illogical representation of design information using drawing or low-fidelity prototyping.

The student demonstrates the making of statements about needs or wants or opportunities.

The student demonstrates: disjointed devising and unclear combination of ideas; identification of a change to ideas or design concepts; unclear decision-making about or use of mode-appropriate features and language.

## 2 Unit 1: Design in practice

### 2.1 Unit description

In Unit 1, students learn about and experience designing in the context of design in practice. Fundamental to design in practice is the principle that design is a purposeful process undertaken by design professionals in response to identified needs, wants and opportunities. Students are introduced to the breadth of design professions, the design process and how designs of the past inform contemporary design practice. Students will experience design directly as they respond to teacher-directed, open-ended, well-defined design problems.

In Topic 1: Experiencing design, the teacher will provide well-constrained problems that introduce students to the develop phase of the design process. Students learn to devise ideas and apply drawing and physical low-fidelity prototyping skills used by designers.

In Topic 2: Design process, students are introduced to the importance of defining problems, writing design briefs and criteria. They gain a deeper experience of the nature and complexity of design problems, how designers work and the importance of users as stakeholders in the design process. Students will devise ideas using thinking strategies and apply digital low-fidelity prototyping skills (interactive or sequential).

In Topic 3: Design styles, students engage with a more comprehensive design process that includes the explore phase and the influence of stakeholders. They will explore how the elements and principles of visual communication have been used to create the design styles of past designers. Illustration sketches are introduced and the importance of documenting the design process.

### 2.2 Unit objectives

Unit objectives are drawn from the syllabus objectives and are contextualised for the subject matter and requirements of the unit. Each unit objective must be assessed at least once.

Students will:

1. describe the features that define design problems and design criteria
2. represent ideas and design concepts using schematic sketching, ideation sketching, and low-fidelity prototyping in the develop phase
3. analyse needs and wants using secondary data about stakeholders and design information
4. devise ideas using divergent thinking strategies in response to design problems in the develop phase
5. synthesise ideas and design information to propose design concepts in the develop phase
6. evaluate ideas and design concepts against design criteria to make refinements
7. make decisions about and use visual and written communication for specified stakeholders.

## 2.3 Topic 1: Experiencing design

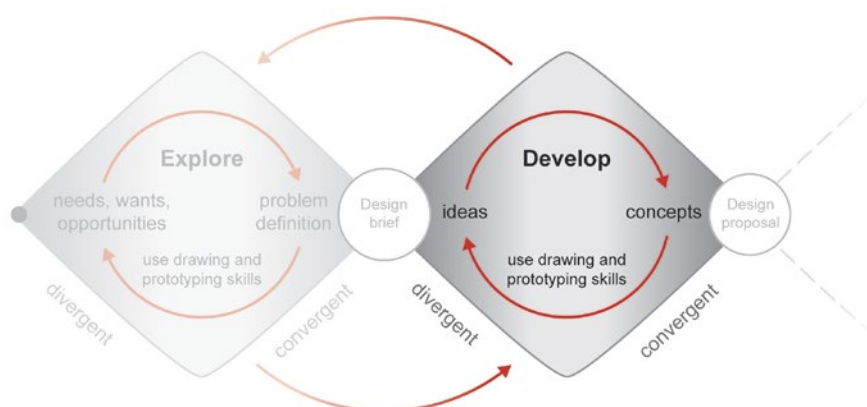
### Guiding question

How do designers use drawing and low-fidelity prototyping skills to devise ideas?

### Aspects of the design process

- Teacher will:
  - specify a design brief and criteria.
- Students will:
  - use ideation sketching and physical low-fidelity prototyping
  - devise ideas.

The figure below emphasises the aspects of the design process that students will use in this topic. The aspects not used in this topic are greyed out.



### Subject matter

In this topic, students will:

- use design briefs provided by the teacher that include
  - a description of a product that could be redesigned to suit a particular person, e.g. redesign a handheld household appliance to suit a child
  - design criteria, including aesthetic and human requirements
- demonstrate using informal conceptual ideation sketching to
  - represent mental images
  - support the rapid devising and testing of design ideas
- demonstrate using informal and conceptual physical low-fidelity prototyping to
  - understand the form, proportion and scale of ideas and design concepts
  - support the rapid devising and testing of ideas
- examine the breadth of the design profession, the types of designers, their scope of work and examples of their designs, including architects, digital media designers, fashion designers, graphic designers, industrial designers, interior designers and landscape architects
- recognise that designers are required to balance competing features, including
  - aesthetic, e.g. the impact on the senses; visual, feel and sound
  - cultural, e.g. established beliefs, values, traditions, laws and languages of a group of people
  - economic, e.g. costs, time, client expectations
  - social, e.g. fashions, trends, tastes, demographics
  - technical, e.g. use, function, sustainability, physical dimensions, ergonomics
- apply an understanding of how designers consider ergonomics when designing to suit a particular person, including
  - the right size for comfortable use
  - use and possible misuse

- collect anthropometric data to inform design ideas, including
  - measuring primary data of people, e.g. length of average arms, average height, size of hand
  - percentiles and percentile ranges
- analyse existing designs to understand how new ideas may come from extrapolation of existing designs or invention
- use divergent thinking strategies to stimulate creative ideas for redesigning products, services and environments, e.g.
  - substitute a new component
  - combine with another design
  - adapt the function
  - modify to increase or reduce scale, shape or form
  - put to other uses without changing the design
  - eliminate components to simplify the design
  - rearrange, reverse, turn upside down
- devise multiple ideas in response to design problems using ideation sketching and physical low-fidelity prototyping techniques that facilitate the quick development of a wide range of ideas
- select ideas that best meet design criteria.



## 2.4 Topic 2: Design process

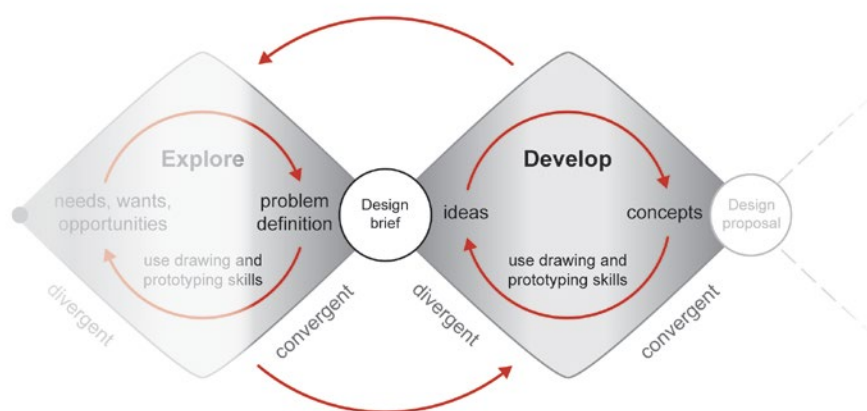
### Guiding question

**What design processes are used by designers?**

### Aspects of the design process

- Teacher will:
  - specify the needs and wants of a stakeholder.
- Students will:
  - write a design brief that defines a problem
  - use ideation sketching, schematic sketching and digital low-fidelity prototyping
  - devise ideas
  - synthesise design concepts.

The figure below emphasises the aspects of the design process that students will use in this topic. The aspects not used in this topic are greyed out.



### Subject matter

In this topic, students will:

- use information provided by the teacher about an identified stakeholder's needs and wants, including
  - needs, e.g. physical needs and required activities
  - wants, e.g. interests and tastes
- demonstrate schematic sketching using abstract representations to
  - aid in the understanding of ideas, design concepts and their key attributes
  - record and analyse information including relationships between design information and aspects of design ideas
- demonstrate the use of digital low-fidelity prototyping to represent and test design ideas and concepts using
  - interactive simulations
  - sequential representations of images and sound (motion graphics)
- analyse design problems to identify that some are simple and some are complex; a problem
  - can be considered a simple problem (or 'tame problem') if it can be clearly defined and the expected outcome is known
  - can be considered a complex problem (or 'wicked problem') if it cannot be defined completely and has hard-to-predict outcomes
- define problems based on an analysis of
  - identified users' aesthetic, cultural, economic, social and technical needs or wants
  - existing designs

- write a design brief to describe the features that define a design problem, including
  - a description of the aesthetic, cultural, economic, social and technical features
  - a list of constraints, e.g. teacher-specified limitations, available time, physical realities, legalities
- recognise that design criteria need to be identified to evaluate the effectiveness and quality of ideas and design concepts in a design process
- describe design criteria based on the requirements of stakeholders and the principles of good design
  - requirements of stakeholders are derived from the aesthetic economic, cultural, social and technical features of the problem
  - the principles of good design are derived from ‘Ten principles of good design’ by Dieter Rams (Vitsø 2017) and the evaluation criteria used by Good Design Australia ([www.gooddesignaustralia.com](http://www.gooddesignaustralia.com)). The following principles of good design are to be used by students when describing design criteria
    - innovative — what aspect of the design is new or unique?
    - useful — how well does the design fulfil its intended purpose?
    - aesthetic — in what way is the design pleasing to view, feel and hear and how does it positively affect humans?
    - accessible — how well does the design communicate its intended function without unnecessary elements, embellishment or decoration?
    - sustainable — how has the design been developed to sustain its useful life and avoid going out of style?
- analyse how designers understand good design, including
  - the 10 principles of good design developed by Dieter Rams (Vitsø 2017), i.e. innovative, useful, aesthetic, understandable, unobtrusive, honest, long-lasting, thorough, environmentally friendly and as little design as possible
  - Good Design Australia evaluation criteria, i.e. form, function, quality, safety, sustainability, commerciality and innovation
- use and compare models of the design processes, including
  - *Design Thinking for Educators* (IDEO 2013)
  - *The Field Guide to Human-Centered Design* (IDEO 2015)
  - The Stanford d.school *Getting started with design thinking* (Hasso Plattner Institute of Design at Stanford University)
  - *Design Minds* (Duell et al. 2014)
- devise ideas by applying design information, divergent thinking strategies, and drawing and low-fidelity prototyping skills to visualise a range of possible ideas
- use schematic sketch, ideation sketch and digital low-fidelity prototyping skills to quickly and simply represent and progress ideas
- use divergent thinking strategies to devise ideas and stimulate thinking, such as
  - iterative thinking — using multiple cycles of idea development and evaluation
  - collaborating — sharing ideas and allowing others to edit, amend and add to the ideas
  - brainstorming — devising as many ideas as possible without critique
- use convergent thinking strategies to progress ideas and identify possible design concepts, such as
  - combining the attributes of two or more ideas
  - using low-fidelity prototyping to quickly test ideas
  - clustering ideas that have common attributes
- evaluate how well design ideas and design concepts satisfy design criteria, considering
  - strengths
  - implications
  - limitations
  - refinements that would improve ideas and design concepts
- propose design concepts that best satisfy the design criteria.

## 2.5 Topic 3: Design styles

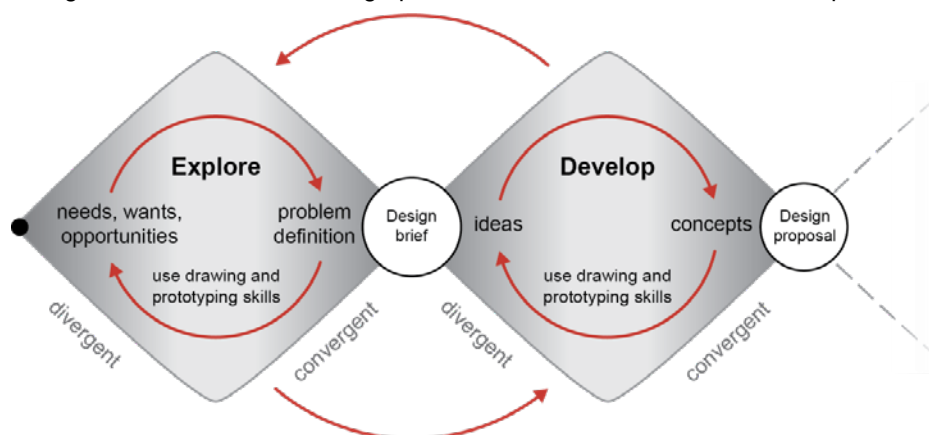
### Guiding question

How have design styles informed contemporary design practice?

### Aspects of the design process

- Teacher will:
  - describe stakeholders
  - specify a design style.
- Students will:
  - analyse needs and wants
  - write a design brief that defines a problem
  - use ideation sketching and illustrations
  - devise ideas
  - synthesise design concepts
  - evaluate against criteria
  - communicate a design proposal.

The figure below shows the design process that students will use in this topic.



### Subject matter

In this topic, students will:

- use information provided by the teacher that includes
  - description of stakeholders
  - the requirement to integrate a specified design style into a design concept
- demonstrate the use of illustration sketching, including
  - a pictorial simulation of the appearance of an object as it would be seen by an observer who looks from a selected point of view; often used to communicate a refined design concept
  - orthographic views that describe the form of a 3D object projected onto 2D planes; often used to communicate a refined design concept
- apply the elements and principles of visual communication
  - elements form the basic components of visual communication, specifically space, line, colour, shape, texture, tone, form, proportion and scale
  - principles are ways of arranging or organising the elements, specifically balance, contrast, proximity, harmony, alignment, repetition and hierarchy
- distinguish the relationship between aesthetics and how designers use the elements and principles of visual communication
- analyse existing designs to understand that designs are informed by the inspiration of past accomplishments

- compare and contrast influential design styles, e.g. Art Deco, Bauhaus, Brutalism, Memphis, Minimalism, Modernism, Postmodernism
- identify the influence of design styles across design professions
- classify how influential designers from the past have used the elements and principles of visual communication. Consider a range of designers, e.g. Marianne Brandt, Margaret Calvert, Lucienne Day, Zaha Hadid, Arne Jacobsen, Raymond Loewy, Charles Rennie Mackintosh, Gerrit Rietveld, Harry Seidler, Vivianna Torun Bülow-Hübe
- form conclusions about how the elements and principles of visual communication are used to define design styles
- analyse what makes classic designs distinguishable, iconic and timeless to understand the reasons for their success, considering how these designs
  - relate to principles of good design
  - defy obsolescence and transcend original function
  - maintain a constant presence in society over time
  - influence decisions to value form over function, e.g. developing new designs based on a classic design (retro-styling)
- recognise that stakeholders have specific needs and wants that must be considered; stakeholders include users, clients, audiences, other designers, other professionals and technicians
- identify a range of stakeholders in a real-world design situation and understand that stakeholders are not always users
- define problems by analysing stakeholder information and information about design styles to
  - identify needs or wants
  - describe the features
- identify design criteria used to judge the quality of design ideas and design concepts, based on
  - stakeholder requirements
  - the principles of good design
  - specific aspects of the design style to be applied
- write design briefs to describe problems and design criteria
- devise ideas by applying the elements and principles of visual communication, divergent thinking strategies and ideation sketching to visualise a range of possible ideas
- identify and interview a possible stakeholder to seek feedback on ideas
- evaluate the extent to which ideas match design criteria; use written notes such as dot points or sentences on drawings to record evaluation
- progress ideas by making modifications to initial ideas based on evaluation against criteria
- synthesise multiple ideas and design style information to propose design concepts in response to design problems
- evaluate the extent to which design concepts meet the design criteria
- make modifications to design concepts that improve the way in which they meet the design criteria; use written notes to indicate where concepts have been improved
- maintain a record of design processes using visual and written modes to understand that documentation is required to support intellectual property rights of design ideas
- use illustrations with written or spoken notes to visually communicate design proposals to audiences.

## 2.6 Assessment guidance

In constructing assessment instruments for Unit 1, schools should ensure that the objectives cover, or are chosen from, the unit objectives. If one assessment instrument is developed for a unit, it must assess all the unit objectives; if more than one assessment instrument is developed, the unit objectives must be covered across those instruments.

The suggested techniques for Unit 1 are an Examination — design challenge and a Project.

## 3 Unit 2: Commercial design

### 3.1 Unit description

In Unit 2, students will learn about and experience designing in the context of commercial design. Fundamental to commercial design is the principle that design is a commercial endeavour that requires designers to respond to the needs and wants of clients.

In Topic 1: Explore — client needs and wants, students investigate the commercial nature of design when designing for a client. They examine how designers influence and are influenced by economics, society and culture.

In Topic 2: Develop — collaborative design, students use a collaborative design approach to develop design proposals for clients in consideration of economic, social and cultural factors. Students experience how designers work collaboratively in teams and the advantages of multiple perspectives on design problems. Students will learn to communicate design proposals to a virtual or live audience in the form of a pitch. The unit provides additional opportunities for students to develop drawing and low-fidelity prototyping skills as they select the most appropriate techniques to represent their ideas and design concepts.

### 3.2 Unit objectives

Unit objectives are drawn from the syllabus objectives and are contextualised for the subject matter and requirements of the unit. Each unit objective must be assessed at least once.

Students will:

1. describe the features that define commercial design problems and design criteria
2. represent ideas, design concepts and economic, social and cultural influences using schematic sketching, ideation sketching and low-fidelity prototyping in the explore and develop phases
3. analyse needs and wants using secondary data about specified clients, existing designs and economic, social and cultural influences in the explore phase
4. devise ideas using divergent thinking strategies in response to design problems in the develop phase
5. synthesise ideas and design information about influences to propose design concepts in the develop phase
6. evaluate ideas and design concepts against design criteria to make refinements
7. make decisions about and use visual, written and spoken communication for clients.

### 3.3 Topic 1: Explore — client needs and wants

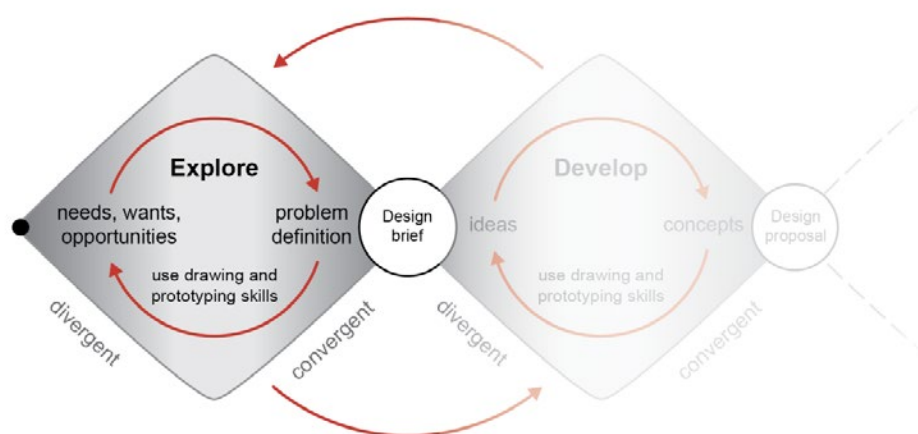
#### Guiding question

**How do economics, society and culture influence designers and how do designers influence economics, culture and society?**

#### Aspects of the design process

- Teacher will:
  - provide a client brief
  - identify economic, social and cultural factors to be considered.
- Students will:
  - use drawing and low-fidelity prototyping appropriate to the need or want
  - analyse the need or want of a client
  - write a design brief to define the problem.

The figure below emphasises the aspects of the design process that students will use in this topic. The aspects not used in this topic are greyed out.



#### Subject matter

In this topic, students will:

- use client briefs provided by the teacher that include
  - demographic information about a client
  - economic, social and cultural information
  - constraints such as available time, physical realities and legalities
- recognise the important role of the client as a stakeholder in commercial design
- analyse the economic, social and cultural factors that influence how designers respond to the expectation of clients, e.g.
  - design as a commercial endeavour that must balance costs, time and client expectations
  - desire for an increase or improvement in the standard of living and physical quality of life
  - fashions, trends and tastes
  - demographic groups that respond differently to designs
  - established beliefs, values and traditions of individuals, groups of people and countries
  - ethical influences, stances and generally acceptable designs and visual representations within a community
  - ethical design and moral responsibility of designers
  - protocols that describe appropriate ways of interacting with designers, communities and the cultural

- material of Aboriginal peoples and Torres Strait Islander peoples
- historical perspectives
- analyse how designers and design styles have influenced changes in the economy, society and culture, e.g.
  - consumerism and consumer choice, the capacity to invent new markets and design for a 'gap in the market'
  - technological advances that remove economic limitations on possible designs
  - impacts on different socio-economic groups when new designs are introduced
  - designs facilitating how people live and engage in social activity
  - brand development and advertising as the communication of a value proposition in society
  - digital disruption
- investigate a client brief to understand needs and wants, and identify design problems considering secondary data about
  - client requirements and demographic information
  - the influence of economic, social and cultural factors
  - existing designs and the practices of contemporary designers
- represent information and analysis of clients' needs and wants using schematic sketching
- write a design brief to describe the features that define the problem
- describe design criteria used to judge the quality of design concepts based on the
  - requirements of the client
  - principles of good design
- document design information using visual, written and/or spoken modes.

## 3.4 Topic 2: Develop — collaborative design

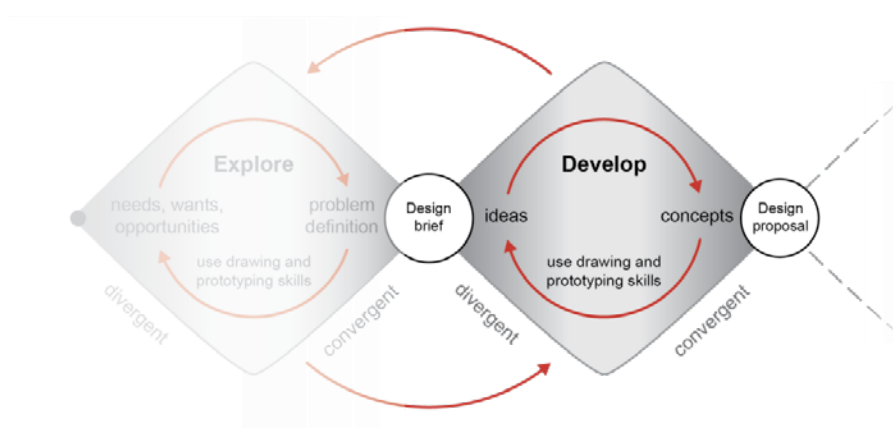
### Guiding question

How do designers work collaboratively to develop designs for their clients?

### Aspects of the design process

- Students will:
  - use drawing and low-fidelity prototyping appropriate to the problem
  - collaborate to devise ideas and synthesise design concepts
  - evaluate against criteria
  - pitch a design proposal to a client.

The figure below emphasises the aspects of the design process that students will use in this topic. The aspects not used in this topic are greyed out.



### Subject matter

In this topic, students will:

- recognise that professional designers work in teams because of the advantage of multiple perspectives on a design problem
- demonstrate the habits of effective design teams and understand how individual behaviour can promote these habits, specifically
  - clear and shared goals
  - mutual trust and support (safe space)
  - open communication
  - democratic processes
  - diverse skill sets and personality types
- organise design teams and team roles, e.g. coordinator, goal setter, troubleshooter, clarifier, opinion seeker, encourager
- recognise the importance of documenting individual and collective work when working within a team of designers
- demonstrate an understanding of design ethics (see the Design Institute of Australia's code of ethics, <http://www.design.org.au/code-of-ethics>), specifically designers' responsibility to
  - the client
  - other designers
- devise multiple ideas using collaborative divergent thinking strategies and information about the influence of economic, social and cultural issues
- evaluate how well ideas match design criteria and make improvements to refine ideas
- select and use the drawing and low-fidelity prototyping skills that best represent the ideas, and use



sequences of representations to progress and improve ideas

- maintain visual and written or spoken record of individual contribution in design processes
- recognise the different kinds of intellectual property including copyright, patents, trademarks and designs and how they apply to the process of design (see IP Australia, [www.ipaustralia.gov.au](http://www.ipaustralia.gov.au))
- synthesise multiple ideas and economic, social and cultural influences using convergent thinking strategies to propose design concepts
- represent design concepts using the appropriate drawing and low-fidelity prototyping to best represent the attributes of the design
- evaluate the strengths, limitations and implications of design concepts against the design criteria to improve design concepts; use written notes to indicate how concepts have been improved
- recognise that the acceptance of a new design concept requires the designer to consider the influence of economic, social and cultural issues from the client's perspective
- demonstrate how design teams use a spoken pitch to present design proposals to clients
- prepare presentations that pitch design proposals to clients, considering
  - client demographics
  - key attributes of the design proposal in regards to economic, social and cultural influences
  - that designs may have positive consequences in some communities and negative influences in others
  - the role of graphic designers in developing and promoting new designs through advertising and publicity
  - the benefits of building a positive user experience and appropriate messages
  - appropriate visual, written and spoken features
- work as a team to present visual and spoken (live or virtual) pitches of design proposals for identified clients
- evaluate the process of collaborative design and how well teams meet goals.

## 3.5 Assessment guidance

In constructing assessment instruments for Unit 2, schools should ensure that the objectives cover, or are chosen from, the unit objectives. If one assessment instrument is developed for a unit, it must assess all the unit objectives; if more than one assessment instrument is developed, the unit objectives must be covered across those instruments.

The suggested techniques for Unit 2 are an Examination — design challenge and a Project.

## 4 Unit 3: Human-centred design

### 4.1 Unit description

In Unit 3, students learn about and experience designing in the context of human-centred design (HCD). Fundamental to HCD is the principle that a designer considers human needs and wants as a higher priority than other influences throughout the design process. The success of a design depends on effectively considering the attitudes, expectations, motivations and experiences of humans. Designers use observations, interviews and experiences to acquire data about people and seek to avoid making assumptions about their needs and wants.

Students will use designing with empathy as an approach to define problems by understanding and experiencing the needs and wants of stakeholders. Students interact with stakeholders throughout the process. Ideas and design concepts are evaluated throughout the process using feedback from stakeholders to determine suitability.

### 4.2 Unit objectives

Unit objectives are drawn from the syllabus objectives and are contextualised for the subject matter and requirements of the unit. Each unit objective must be assessed at least once.

Students will:

Unit objective	IA1	IA2
1. <u>describe</u> the <u>features</u> that define HCD problems and <u>design criteria</u>		•
2. <u>represent ideas</u> , <u>design concepts</u> and HCD information using <u>schematic sketching</u> , <u>ideation sketching</u> and <u>low-fidelity prototyping</u> in the <u>explore</u> and <u>develop</u> phases	•	•
3. <u>analyse</u> needs and wants using data about <u>stakeholders</u> , existing designs and HCD information		•
4. <u>devise</u> ideas using divergent thinking strategies in response to HCD problems in the develop phase	•	•
5. <u>synthesise</u> ideas and HCD information to propose HCD concepts in the develop phase	•	•
6. <u>evaluate</u> ideas and HCD concepts against design criteria to make refinements	•	•
7. <u>make decisions</u> about and use visual, written and spoken communication for stakeholders.		•

## 4.3 Topic 1: Designing with empathy

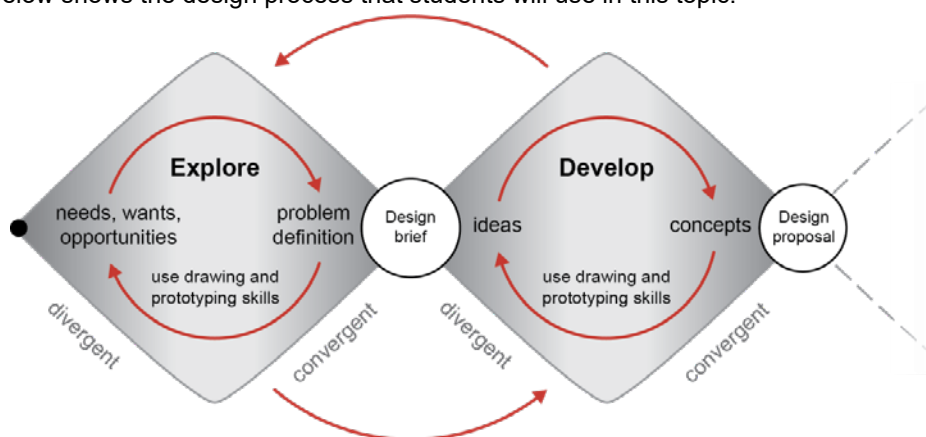
### Guiding question

How do designers ensure their designs meet the needs and wants of people?

### Aspects of the design process

- Students will:
  - identify a person or group of people as stakeholders, including
    - a school community
    - not-for-profit organisations such as sporting clubs, churches and community support groups
    - neighbours
    - community or individuals in a foreign country
    - local businesses
    - an identifiable demographic group
  - analyse stakeholders' needs or wants
  - use drawing and low-fidelity prototyping appropriate to the design problem and the requirements of the stakeholders
  - write a design brief for stakeholders to define the problem
  - devise and evaluate ideas with stakeholders
  - synthesise and evaluate design concepts with stakeholders
  - communicate a design proposal to stakeholders

The figure below shows the design process that students will use in this topic.



### Subject matter

In this topic, students will:

- recognise that in HCD
  - human needs and wants are the driving force behind the design
  - collaborating with people and demonstrating empathy will assist the designer to meet the clients' needs and wants
  - the designer must act with integrity
- recognise design ethics, specifically a designer's responsibility to the client (see the Design Institute of Australia's code of ethics, [www.design.org.au/code-of-ethics](http://www.design.org.au/code-of-ethics))
- apply an understanding of the influence of human attitudes, expectations, motivations and experiences on designing including
  - the four-pleasure framework
    - socio-pleasure — derived from social interaction. Good design can facilitate social interaction, e.g. jewellery that promotes social interaction by being a conversation starter
    - physio-pleasure — derived from the feel of a product during use, e.g. the smooth feel of a new

- mobile phone
  - psycho-pleasure — derived from the cognitive demands of using a product and the emotional reactions experienced when using it, e.g. a new software application that allows tasks to be accomplished quickly and easily
  - ideo-pleasure — derived from products that appeal to the person's values or beliefs, e.g. a biodegradable shopping bag
- the attract/converse/transact (ACT) framework (Van Gorp & Adams 2012); designs can intentionally trigger emotional responses when all three elements are addressed
  - attract — aesthetics oriented
  - converse — interaction oriented
  - transact — function oriented
- apply an understanding of ergonomics when designing for humans, including
  - anthropometric data derived from the user
  - range of sizes versus adjustability
  - clearance, reach and adjustability
- demonstrate designing with empathy techniques to understand attitudes, expectations, motivations and experiences of stakeholders. Techniques include
  - observations, e.g. spending time with people to see and hear them and to identify the needs and wants that have not been addressed by current products, services and environments
  - interviews, e.g. asking open ended 'why' questions and identifying people's likes and dislikes
  - experiences, e.g. simulating a person's physical impairment by a student wearing glasses to reduce vision or wearing gloves to limit grip and strength
- investigate needs and wants of stakeholders, including
  - primary data from stakeholders about attitudes, expectations, motivations and experiences
  - HCD information
  - existing designs
- use empathy maps to represent needs and wants of stakeholders
- write design briefs to describe the relevant economic, social, cultural, aesthetic and technical features that define problems
- confirm conclusions with stakeholders to clarify understandings
- review how to identify and describe design criteria using
  - requirements of stakeholders
  - the principles of good design, i.e. innovative, useful, aesthetic, accessible, sustainable
- describe design criteria based on requirements and principles of good design that can be used to judge the quality of ideas and design concepts
- devise multiple possible ideas using divergent thinking strategies and HCD information in response to the problem; divergent thinking strategies are selected to suit the problem
- select and use the drawing and low-fidelity prototyping skills that best represent the ideas and facilitate the progression of the ideas
- collaborate with stakeholders to test and refine ideas against the design criteria
- review and amend design briefs and criteria based on knowledge about design problems identified through the development of ideas and collaboration with stakeholders
- synthesise multiple ideas and information using convergent thinking strategies to propose design concepts
- represent design concepts using the appropriate drawing and low-fidelity prototyping to best represent the attributes of the design
- make decisions in consideration of stakeholders' feedback and the evaluation of the strengths, limitations and implications of ideas and design concepts against the design criteria to make refinements
- develop the skill of writing short succinct notes or comments on visual communication to explain decisions and record the evaluation of ideas and design concepts
- maintain records using visual and written modes to demonstrate intellectual property rights of design ideas
- create communication including spoken live or virtual pitches and visual representations to communicate the suitability of design concepts for stakeholders.

## 4.4 Assessment

### 4.4.1 Summative internal assessment 1 (IA1): Examination — design challenge (15%)

#### Description

The assessment is a supervised test that assesses the application of a range of cognitions to a provided design problem.

Student responses must be completed individually, under supervised conditions, and in a set timeframe. Stimulus is seen prior to the examination.

#### Assessment objectives

This assessment technique is used to determine student achievement in the following objectives:

2. represent ideas and a design concept using ideation and/or schematic sketching in the develop phase
4. devise ideas using divergent thinking strategies in response to a HCD problem in the develop phase
5. synthesise ideas and HCD information to propose a HCD concept in the develop phase
6. evaluate the strengths, limitations and implications of ideas against design criteria to make refinements.

**Note:** Objectives 1, 3 and 7 are not covered in this assessment.

#### Specifications

##### Description

In Design, a design challenge involves students documenting a period of focused design work to meet a deadline. Students use the develop phase of the design process to respond to a design brief and stimulus. The teacher will provide:

- seen stimulus to support the design brief
- a HCD need or want described in an unseen design brief with criteria.

The student response will include the following assessable evidence:

- ideas devised in response to a HCD problem
- evaluation of ideas against design criteria to make refinements
- synthesis of ideas and HCD information to propose a design concept
- representation of ideas and a design concept using ideation and/or schematic sketching.

##### Conditions

- Stimulus materials: a maximum of two A3 sheets of visual and written stimulus provided 24 hours prior to the examination
- Time: one hour plus planning (15 minutes)
- Length: four A3 pages

- All work must be completed individually. Teachers will supervise the assessment, but not provide any guidance or assistance in completing the task.
- Other:
  - teachers must ensure the purpose of this technique is not compromised by the seen stimulus
  - equipment required: black ink pen, black felt-tip pen, 2B pencil, sharpener, eraser, ruler, a set of coloured pencils or pens, A3 tracing paper.

## Summary of the instrument-specific marking guide

The following table summarises the criteria, assessment objectives and mark allocation for the design challenge.

Criteria	Objectives	Marks
Devising	4	5
Synthesising and evaluating	5 and 6	5
Representing and communicating	2	5
<b>Total</b>		<b>15</b>

**Note:** Unit objectives 1, 3 and 7 are not assessed in this instrument.

## Instrument-specific marking guide

### Criterion: Devising

#### Assessment objectives

4. devise ideas using divergent thinking strategies in response to a HCD problem in the develop phase

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"> <li>• <u>multiple</u> ideas <u>perceptively</u> devised from different <u>points of view</u> — with each idea incorporating <u>unique</u>, <u>credible</u> and <u>detailed</u> attributes — using divergent thinking strategies in response to a HCD problem in the develop phase.</li> </ul>	4–5
<ul style="list-style-type: none"> <li>• ideas <u>appropriately</u> devised — with each idea incorporating credible and detailed attributes — using a divergent thinking strategy in response to a HCD problem in the develop phase.</li> </ul>	2–3
<ul style="list-style-type: none"> <li>• ideas <u>disjointedly</u> devised in response to <u>aspects</u> of the HCD problem.</li> </ul>	1
<ul style="list-style-type: none"> <li>• does not satisfy any of the descriptors above.</li> </ul>	0

## Criterion: Synthesising and evaluating

### Assessment objectives

5. synthesise ideas and HCD information to propose a HCD concept in the develop phase
6. evaluate the strengths, limitations and implications of ideas against design criteria to make refinements

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"><li>• <u>coherent</u> and <u>logical</u> synthesis by combining attributes of multiple ideas and HCD information to propose an <u>innovative</u> HCD concept in the develop phase</li><li>• <u>critical</u> evaluation of the strengths, limitations and implications of ideas against design criteria to make <u>discerning</u> refinements that improve ideas.</li></ul>	4–5
<ul style="list-style-type: none"><li>• <u>simple</u> synthesis of ideas and aspects of HCD information to propose a HCD concept in the develop phase</li><li>• <u>feasible</u> evaluation of the strengths, limitations and implications of ideas against some design criteria to make adequate refinements to ideas.</li></ul>	2–3
<ul style="list-style-type: none"><li>• <u>unclear</u> combination of ideas</li><li>• identification of a change to ideas.</li></ul>	1
<ul style="list-style-type: none"><li>• does not satisfy any of the descriptors above.</li></ul>	0

## Criterion: Representing and communicating

### Assessment objectives

2. represent ideas and a design concept using ideation and/or schematic sketching in the develop phase

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"><li>• <u>sophisticated</u> representation of ideas and a design concept using <u>fluent</u> sequences of ideation and/or schematic sketching to <u>progress</u> understanding in the develop phase.</li></ul>	4–5
<ul style="list-style-type: none"><li>• <u>appropriate</u> representation of ideas and a design concept using ideation and/or schematic sketching in the develop phase to progress understanding of ideas.</li></ul>	2–3
<ul style="list-style-type: none"><li>• <u>cursor</u>y representation of ideas and a design concept using <u>unclear</u> ideation and/or schematic sketching in the develop phase.</li></ul>	1
<ul style="list-style-type: none"><li>• does not satisfy any of the descriptors above.</li></ul>	0

## 4.4.2 Summative internal assessment 2 (IA2): Project (35%)

### Description

This assessment focuses on a design process that requires the application of a range of cognitive, technical and creative skills and theoretical understandings. Students document the iterative process undertaken to explore and develop a response to a stakeholder's need or want. The response is a coherent work that may include drawings, low-fidelity prototypes, written paragraphs, notes, photographs, video and spoken presentations. This assessment occurs over an extended and defined period of time. Students may use class time and their own time to develop a response.

### Assessment objectives

1. describe the features that define a HCD problem and design criteria based on stakeholders' requirements and principles of good design
2. represent ideas, a design concept and HCD information using ideation sketching, schematic sketching and low-fidelity prototyping in the explore and develop phases
3. analyse needs and wants using primary data about stakeholders and secondary data about existing designs and HCD information
4. devise ideas using divergent thinking strategies in response to the HCD problem in the develop phase
5. synthesise ideas and HCD information to propose a HCD concept in the develop phase
6. evaluate the strengths, limitations and implications of ideas and a HCD concept against design criteria to make refinements
7. make decisions about and use visual, written and spoken communication to present a design brief and design proposal for stakeholders.



## Specifications

### Description

In Design, a project involves students documenting the application of a design process in response to a teacher-facilitated direct stimulus, e.g. guiding question, case study, stakeholder information, visual stimulus. Students identify a stakeholder and apply the HCD process in response to their needs and wants. The project will be in three parts and have the following assessable evidence:

Part A — visual documentation of the design process, including

- representation of ideas, a design concept and HCD information using drawing and low-fidelity prototyping in the explore and develop phases
- analysis of the needs and wants of an identified stakeholder using
  - primary data, e.g. interviews with stakeholders
  - secondary data, e.g. analysis of existing designs and HCD information
- ideas devised in response to the HCD problem using divergent thinking strategies in the develop phase of the design process
- synthesis of ideas and HCD information to propose a design concept
- evaluation of the strengths, limitations and implications of ideas and a design concept against the design criteria to make refinements that improve ideas including
  - written or spoken notes referenced to relevant drawings and/or low-fidelity prototypes
  - changes or amendments to drawings and/or low-fidelity prototypes
- evidence of primary sources, acknowledgment of secondary sources (references for images and text) and documentation of progressive development.

Part B — written design brief and criteria, including

- description of
  - the features that define the HCD problem
  - design criteria based on stakeholders' requirements and the principles of good design
- communication using written features, design language and conventions

Part C — design proposal presented with a spoken pitch (live or virtual) for stakeholders, including

- evaluation of how well the design concept satisfies the design criteria
- visual presentation of the design concept using illustrations that may be supported by photographs or video of low-fidelity prototypes.

### Conditions

- Length:
  - Part A: 10–12 A3 pages
  - Part B: one A3 page (maximum 400 words)
  - Part C: 2–3 minute spoken supported by two A3 pages
- Other:

- the cover page, table of contents and reference list are not included in the page count
- schools implement authentication strategies that reflect QCAA guidelines.

## Summary of the instrument-specific marking guide

The following table summarises the criteria, assessment objectives and mark allocation for the objectives assessed in the project.

Criteria	Objectives	Marks
Exploring	1 and 3	10
Devising	4	7
Synthesising and evaluating	5 and 6	10
Representing and communicating	2 and 7	8
<b>Total</b>		<b>35</b>

## Instrument-specific marking guide

### Criterion: Exploring

#### Assessment objectives

1. describe the features that define a HCD problem and design criteria based on stakeholders' requirements and principles of good design
3. analyse needs and wants using primary data about stakeholders and secondary data about existing designs and HCD information

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"> <li>• <u>discerning</u> description of the features that define a HCD problem and <u>essential</u> design criteria based on stakeholders' requirements and principles of good design</li> <li>• <u>insightful</u> analysis of needs and wants using relevant primary data about stakeholders and secondary data about existing designs and HCD information to identify the <u>significant</u> features, constraints and the relationships between them.</li> </ul>	9–10
<ul style="list-style-type: none"> <li>• <u>effective</u> description of the features that define a HCD problem and design criteria based on stakeholders' requirements and principles of good design</li> <li>• <u>considered</u> analysis of needs and wants using relevant primary data about stakeholders and secondary data about existing designs and HCD information to identify <u>valid</u> features, constraints and the relationships between them.</li> </ul>	7–8
<ul style="list-style-type: none"> <li>• <u>adequate</u> description of the features that define a HCD problem and some design criteria based on stakeholders' requirements and principles of good design</li> <li>• <u>appropriate</u> analysis of needs and wants using primary data about stakeholders and secondary data about existing designs and HCD information to identify some features, constraints and the relationships between them.</li> </ul>	5–6
<ul style="list-style-type: none"> <li>• <u>superficial</u> description of a HCD problem and some design criteria</li> <li>• superficial analysis of needs and wants using HCD information to identify <u>partial</u> features.</li> </ul>	3–4
<ul style="list-style-type: none"> <li>• description of aspects of a HCD problem</li> <li>• statements about needs and/or wants.</li> </ul>	1–2
<ul style="list-style-type: none"> <li>• does not satisfy any of the descriptors above.</li> </ul>	0

### Criterion: Devising

## Assessment objectives

- devise ideas using divergent thinking strategies in response to the HCD problem in the develop phase

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"> <li>multiple ideas perceptively devised from different points of view — with each idea incorporating unique, credible and detailed attributes — using divergent thinking strategies in response to the HCD problem in the develop phase.</li> </ul>	6–7
<ul style="list-style-type: none"> <li>ideas purposefully devised — with each idea incorporating unique, credible and detailed attributes — using a divergent thinking strategy in response to the HCD problem in the develop phase.</li> </ul>	4–5
<ul style="list-style-type: none"> <li>ideas appropriately devised — with each idea incorporating credible attributes in response to the HCD problem in the develop phase.</li> </ul>	2–3
<ul style="list-style-type: none"> <li>ideas disjointedly devised in response to aspects of the HCD problem.</li> </ul>	1
<ul style="list-style-type: none"> <li>does not satisfy any of the descriptors above.</li> </ul>	0

## Criterion: Synthesising and evaluating

### Assessment objectives

- synthesise ideas and HCD information to propose a HCD concept in the develop phase
- evaluate the strengths, limitations and implications of ideas and HCD design concept against design criteria and make refinements

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"> <li>coherent and logical synthesis by combining attributes of multiple ideas and HCD information to propose an innovative HCD concept in the develop phase</li> <li>critical evaluation of the strengths, limitations and implications of ideas and a HCD concept against design criteria to make discerning refinements.</li> </ul>	9–10
<ul style="list-style-type: none"> <li>logical synthesis by combining ideas and HCD information to propose a credible HCD concept in the develop phase</li> <li>reasoned evaluation of the strengths, limitations and implications of ideas and the HCD concept against design criteria to make effective refinements.</li> </ul>	7–8
<ul style="list-style-type: none"> <li>simple synthesis by combining ideas and HCD information to propose a HCD concept</li> <li>feasible evaluation of the strengths and limitations of ideas and the HCD concept against some design criteria to make adequate refinements.</li> </ul>	5–6
<ul style="list-style-type: none"> <li>rudimentary synthesis of ideas to propose a partial HCD concept</li> <li>superficial evaluation of ideas or the HCD concept against some design criteria.</li> </ul>	3–4
<ul style="list-style-type: none"> <li>unclear combination of ideas</li> <li>make statements about ideas or the HCD concept.</li> </ul>	1–2
<ul style="list-style-type: none"> <li>does not satisfy any of the descriptors above.</li> </ul>	0

## Criterion: Representing and communicating

### Assessment objectives

2. represent ideas, a design concept and HCD information using ideation sketching, schematic sketching and low-fidelity prototyping in the explore and develop phases
7. make decisions about and use visual, written and spoken communication to present a design brief and design proposal for stakeholders

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"><li>• <u>sophisticated</u> representation of ideas, a design concept and HCD information using <u>fluent</u> sequences of ideation sketching, schematic sketching and low-fidelity prototyping to <u>progress</u> understanding in the explore and develop phases</li><li>• <u>discerning</u> decision-making about, and <u>fluent</u> use of,<ul style="list-style-type: none"><li>– spoken features, design-specific vocabulary and visual elements and principles to present a design proposal for a live or virtual stakeholder audience</li><li>– written conventions, features and design-specific language to present a design brief for stakeholders.</li></ul></li></ul>	7–8
<ul style="list-style-type: none"><li>• <u>considered</u> representation of ideas, a design concept and HCD information using <u>proficient</u> ideation sketching, schematic sketching and low-fidelity prototyping to progress understanding in the explore and develop phases</li><li>• <u>effective</u> decision-making about, and <u>proficient</u> use of,<ul style="list-style-type: none"><li>– spoken features, design-specific vocabulary and visual elements and principles to present a design proposal for a live or virtual stakeholder audience</li><li>– written conventions, features and design-specific language to present a design brief for stakeholders.</li></ul></li></ul>	5–6
<ul style="list-style-type: none"><li>• <u>appropriate</u> representation of ideas, a design concept and HCD information using ideation sketching, schematic sketching and low-fidelity prototyping in the explore and develop phases</li><li>• appropriate decision-making about, and use of,<ul style="list-style-type: none"><li>– spoken features and visual elements and principles to present a design proposal</li><li>– written features to present a design brief.</li></ul></li></ul>	3–4
<ul style="list-style-type: none"><li>• <u>cursor</u>y representation of ideas and information using unclear sketching or low-fidelity prototyping in the design process</li><li>• <u>variable</u> decision-making, and inconsistent use of,<ul style="list-style-type: none"><li>– spoken features or visual elements</li><li>– written conventions.</li></ul></li></ul>	1–2
<ul style="list-style-type: none"><li>• does not satisfy any of the descriptors above.</li></ul>	0

# 5 Unit 4: Sustainable design

## 5.1 Unit description

In Unit 4, students learn about and experience designing in the context of sustainable design. Fundamental to sustainable design is the principle that designers should create new designs that can be supported indefinitely in terms of their economic, social and ecological impact on the wellbeing of humans.

In Topic 1: Explore — sustainable design opportunities, students explore how designers identify design opportunities without working from a brief provided by stakeholders. Where Unit 3 focused on working closely with people to meet their needs and wants, this topic explores how stakeholders are encouraged to accept a designed solution they did not realise they needed prior to its development. Students learn that designers influence and are influenced by sustainability. They identify and investigate opportunities to redesign products, services or environments to improve their sustainability.

In Topic 2: Develop — redesign, students will use a redesigning approach to develop ideas and design concepts in response to opportunities identified in Topic 1. This includes applying circular design methods to improve the sustainability of their designs. Students will communicate the sustainable attributes of design concepts to stakeholders and the opportunities that they represent.

## 5.2 Unit objectives

Unit objectives are drawn from the syllabus objectives and are contextualised for the subject matter and requirements of the unit. Each unit objective must be assessed at least once.

Students will:

Unit objective	IA3	EA
1. <u>describe</u> the <u>features</u> and sustainable requirements that define redesign problems and <u>design criteria</u>	•	
2. <u>represent</u> <u>ideas</u> , <u>design concepts</u> and sustainability information using <u>schematic</u> sketching and <u>ideation</u> sketching and/or <u>low-fidelity prototyping</u> in the <u>explore</u> and <u>develop</u> phases	•	•
3. <u>analyse</u> redesign opportunities using data about existing <u>designed solutions</u> and sustainability information	•	
4. <u>devise</u> ideas using divergent thinking strategies and circular design methods in response to redesign problems in the develop phase	•	•
5. <u>synthesise</u> ideas and sustainability information to propose sustainable design concepts in the develop phase	•	•
6. <u>evaluate</u> the strengths, limitations and implications of ideas and design concepts against design criteria to make refinements	•	•
7. <u>make decisions</u> about and use visual, written and/or spoken communication for stakeholders.	•	

## 5.3 Topic 1: Explore — sustainable design opportunities

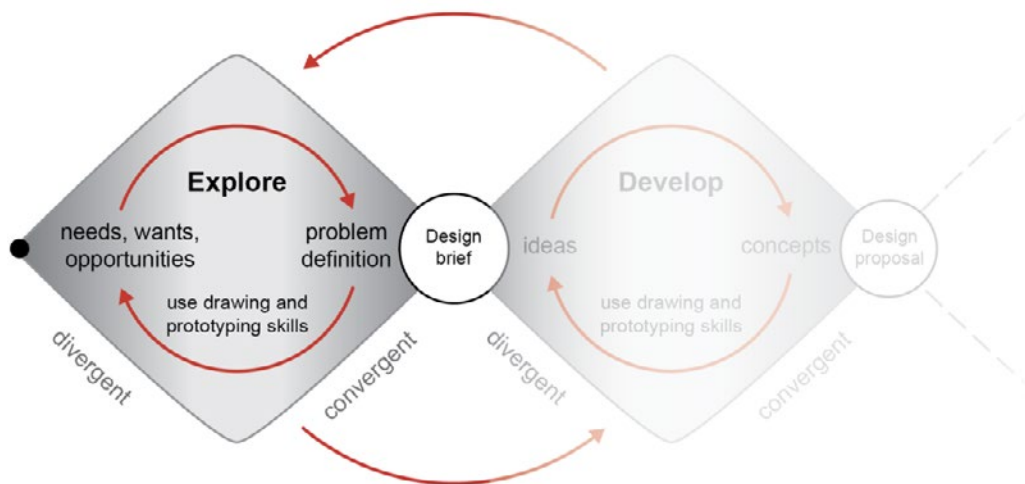
### Guiding question

How are sustainable design opportunities identified?

### Aspects of the design process

- Students will:
  - identify and analyse a design opportunity
  - use drawing and low-fidelity prototyping appropriate to the opportunity
  - write a design brief to define a problem.

The figure below emphasises the aspects of the design process that students will use in this topic. The aspects not used in this topic are greyed out.



### Subject matter

In this topic, students will:

- identify a design opportunity
- recognise that design opportunities may be explored to
  - fill a gap in the market
  - create a market for something that previously did not exist
  - improve human wellbeing
- recognise design ethics, specifically designers'
  - responsibilities to the community
  - responsibilities to other designers (see the Design Institute of Australia's code of ethics, [www.design.org.au/code-of-ethics](http://www.design.org.au/code-of-ethics))
- recognise that sustainable design is influenced by decisions at a local, national and global level and is an approach to designing that seeks to support human wellbeing indefinitely while balancing the impact of economic, social and ecological sustainability
  - economic sustainability relates to the market-based private sector and the public and non-profit sectors. Designers' tasks include expanding or creating markets, and improving consumer appeal of designs and profitability
  - social sustainability relates to the functional, aesthetic and symbolic role of design and how it can support human wellbeing
  - ecological sustainability relates to the issue that human systems are overwhelming nature's systems, impacting environmental conditions that support human wellbeing

- analyse examples of successful design opportunities, e.g. portable digital devices, digital games and apps, fashion items, and household products, by considering
  - the nature of the design life cycle:
    - launch — when a design is introduced to the market
    - growth — when the market has accepted the design and sales increase
    - maturity — when the sales have reached their peak
    - decline — when sales decline as the design reaches saturation point
- analyse unsustainable design approaches that focus on a linear take, make and dispose model
- compare sustainable design approaches, e.g. green design, sustainable fashion, sustainable architecture, sustainable graphic design, to identify similarities and differences
- investigate existing products, services and environments to identify how they could be redesigned to improve their economic, social or ecological sustainability and therefore create a new design opportunity
- examine selected products, services or environments to define redesign opportunities
  - determine the range of stakeholders that would be associated with a redesigned product, service or environment
  - identify aesthetic, cultural, economic, social and technical features
- write design briefs to describe problems
- identify design criteria used to judge the quality of design ideas and design concepts based on
  - requirements including economic, social and ecological sustainability
  - principles of good design
- maintain a record of designs using visual and written modes.

## 5.4 Topic 2: Develop — redesign

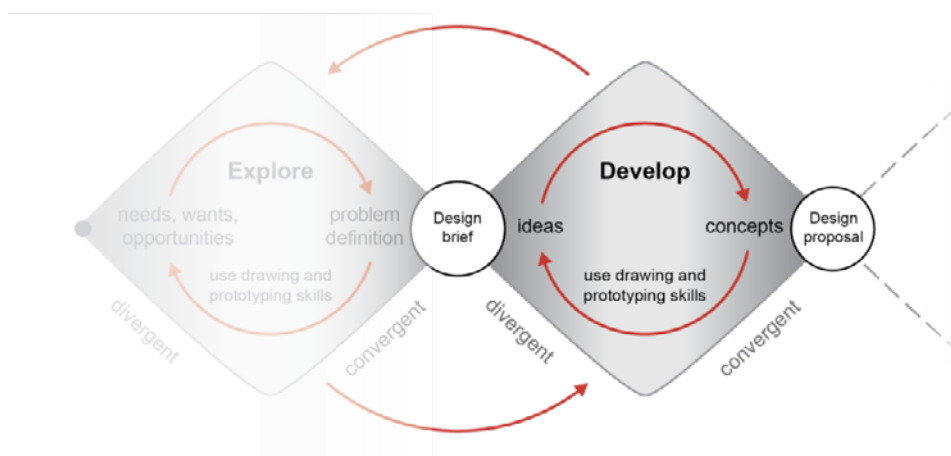
### Guiding question

**How do designers redesign for sustainability?**

### Aspects of design process

- Students will:
  - use drawing and low-fidelity prototyping appropriate to the design problem
  - devise and evaluate ideas
  - synthesise and evaluate design concepts
  - communicate a design proposal to stakeholders.

The figure below emphasises the aspects of the design process that students will use in this topic. The aspects not used in this topic are greyed out.



## Subject matter

In this topic, students will:

- recognise that designers need to consider the whole life cycle of potential products, environments and services
- recognise that designs may affect economic, social and ecological sustainability in ways that are unpredictable and beyond the control of the designer such as software, materials and production decisions or how stakeholders use the designed solution
- recognise how design decisions contribute to planned obsolescence (to artificially limit the useful life), which is a key strategy in increasing consumption and economic growth
- predict how their design decisions either encourage or discourage obsolescence including
  - function, e.g. new designs that do something better, therefore making the existing designs inferior
  - quality, e.g. the time taken to wear out or break
  - desirability, e.g. something is considered out of fashion by the arrival of newer and more exciting options
- recognise circular design methods including
  - considering the future of a design beyond a single design life cycle for a specific user
  - creating more value by enabling multiple uses and users of a design
  - focusing on increasing positive impacts rather than reducing negative impacts
- apply circular design methods to devise ideas in response to a redesign opportunity, e.g.
  - a product that could be continuously repurposed in a 'closed loop'
  - a service that could replace a product solution, e.g. a personal mobility service rather than a new car
  - a product or environment that could add value to the ecosystem, e.g. biodegradable products that break down, just as in nature
  - a service or environment that could be renewed, e.g. able to be upgraded, reprogramed or refurbished for indefinite service
- devise ideas by using divergent thinking strategies, schematic sketches and ideation sketches and/or low-fidelity prototypes to represent a range of redesign ideas
- review strategies that can be used to stimulate the redesign of products, services and environments, such as substitute, combine, adapt, modify, put to other uses, eliminate components and rearrange
- consult with relevant stakeholders to test ideas and identify the potential of opportunities to
  - fill a gap in the market
  - create a market for something that previously did not exist
  - improve human wellbeing
- evaluate the strengths, limitations and implications of ideas against design criteria
- synthesise multiple ideas and design information to propose design concepts
- make refinements based on evaluation against design criteria with a focus on improving the economic, social and ecological sustainability of design ideas
- curate visual displays of design concepts by selecting visual communications that effectively demonstrate the sustainable features of design concepts; visual communication includes ideation sketches, illustrations, diagrams, photographs, motion graphics, interactive simulations and physical low-fidelity prototypes
- use written notes on the visual communication to explain decisions and record the evaluation of ideas and design concepts. Notes and comments may be spoken where it is not practical to write on visual communication.



## 5.5 Assessment

### 5.5.1 Summative internal assessment 3 (IA3): Project (25%)

#### Description

This assessment focuses on a design process that requires the application of a range of cognitive, technical and creative skills and theoretical understandings. Students document the iterative process undertaken to explore and develop a response to a design opportunity. The response is a coherent work that may include drawings, low-fidelity prototypes, written paragraphs, notes, photographs, video and spoken presentations. This assessment occurs over an extended and defined period of time. Students may use class time and their own time.

#### Assessment objectives

This assessment technique is used to determine student achievement in the following objectives:

1. describe the features and sustainable requirements that define a redesign problem and design criteria based on the requirements of the opportunity and the principles of good design
2. represent ideas, a sustainable design concept and sustainability information using schematic sketching and ideation sketching and/or low-fidelity prototyping in the explore and develop phases
3. analyse redesign opportunities using data about existing designed solutions and sustainability information
4. devise ideas using divergent thinking strategies and circular design methods in response to a redesign problem in the develop phase
5. synthesise ideas and sustainability information to propose a sustainable design concept in the develop phase
6. evaluate the strengths, limitations and implications of ideas and a sustainable design concept against design criteria to make refinements
7. make decisions about and use visual, written and/or spoken communication to present a design brief and visual display of a design proposal for stakeholders.

#### Specifications

##### Description

In Design, a project involves students documenting the application of a design process in response to a teacher-facilitated direct stimulus, e.g. guiding question, case study, visual stimulus. Students identify an opportunity and redesign a product, service or environment to improve its sustainability. The project will be in three parts and have the following assessable evidence.

Part A — visual documentation of the design process, including:

- representation of ideas, a sustainable design concept and sustainability information using schematic sketching and ideation sketching and/or low-fidelity prototyping in the explore and develop phases
- analysis of the redesign opportunity, existing designed solutions and sustainability information
- ideas devised in response to the problem using divergent thinking strategies and circular design methods in the develop phase of the design process

- synthesis of ideas and sustainability information to propose a sustainable design concept
- evaluation of the strengths, limitations and implications of ideas and a sustainable design concept against the design criteria to make refinements that improve ideas including
  - written or spoken notes referenced to relevant drawings and/or low-fidelity prototypes
  - changes or amendments to drawings and/or low-fidelity prototypes
- evidence of primary sources, acknowledgment of secondary sources (references for images and text) and documentation of progressive development.

Part B — written design brief and criteria, including:

- description of
  - the features and sustainable requirements that define the redesign problem
  - design criteria based on requirements and the principles of good design
- communication using written features, design language and conventions.

Part C — design proposal for stakeholders, including:

- evaluation of how well the sustainable design concept satisfies the design criteria
- visual presentation of the sustainable design concept using illustrations that may be supported by photographs or video of low-fidelity prototypes.

### Conditions

- Length:
  - Part A: 8–10 A3 pages
  - Part B: one A3 page (maximum 300 words)
  - Part C: one A3 page
- Other:
  - the cover page, table of contents and reference list are not included in the page count
  - schools implement authentication strategies that reflect QCAA guidelines.

### Summary of the instrument-specific marking guide

The following table summarises the criteria, assessment objectives and mark allocation for the objectives assessed in the project.

Criteria	Objectives	Marks
Exploring	1 and 3	7
Devising	4	5
Synthesising and evaluating	5 and 6	5
Representing and communicating	2 and 7	8
<b>Total</b>		<b>25</b>

## Instrument-specific marking guide

### Criterion: Exploring

#### Assessment objectives

1. describe the features and sustainable requirements that define a redesign problem and design criteria based on the requirements of the opportunity and the principles of good design
3. analyse redesign opportunities using data about existing designed solutions and sustainability information

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"><li>• <u>discerning</u> description of features and sustainable requirements that define a redesign problem and <u>essential</u> design criteria based on the requirements of the opportunity and the principles of good design</li><li>• <u>insightful</u> analysis of redesign opportunities using <u>relevant</u> data about existing designed solutions and sustainability to identify the significant features, constraints and the relationships between them.</li></ul>	6–7
<ul style="list-style-type: none"><li>• <u>adequate</u> description of features and sustainable requirements that define a redesign problem and some design criteria based on the requirements of the opportunity and the principles of good design</li><li>• <u>appropriate</u> analysis of redesign opportunities using data about existing designed solutions and sustainability to identify features and constraints.</li></ul>	4–5
<ul style="list-style-type: none"><li>• <u>superficial</u> description of a redesign problem with sustainable requirements and some design criteria</li><li>• superficial analysis of redesign opportunities to identify some <u>partial</u> features.</li></ul>	2–3
<ul style="list-style-type: none"><li>• description of aspects of a redesign problem</li><li>• statements about opportunities.</li></ul>	1
<ul style="list-style-type: none"><li>• does not satisfy any of the descriptors above.</li></ul>	0

## Criterion: Devising

### Assessment objectives

4. devise ideas using divergent thinking strategies and circular design methods in response to a redesign problem in the develop phase

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"><li>Multiple ideas <u>perceptively</u> devised from different points of view — with each idea incorporating unique, credible and detailed attributes — using divergent thinking strategies and circular design methods in response to a redesign problem in the develop phase.</li></ul>	4–5
<ul style="list-style-type: none"><li>ideas appropriately devised — with each idea incorporating credible and detailed attributes — using a divergent thinking strategy and aspects of circular design methods in response to a redesign problem in the develop phase.</li></ul>	2–3
<ul style="list-style-type: none"><li>ideas disjointedly devised in response to aspects of a redesign problem.</li></ul>	1
<ul style="list-style-type: none"><li>does not satisfy any of the descriptors above.</li></ul>	0

## Criterion: Synthesising and evaluating

### Assessment objectives

5. synthesise ideas and sustainability information to propose a sustainable design concept in the develop phase
6. evaluate the strengths, limitations and implications of ideas and a sustainable design concept against design criteria to make refinements

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"><li><u>coherent</u> and <u>logical</u> synthesis by combining attributes of multiple ideas and sustainability information to propose an <u>innovative</u> sustainable design concept in the develop phase</li><li><u>critical</u> evaluation of the strengths, limitations and implications of ideas and a sustainable <u>design</u> concept against design criteria to make discerning refinements that improve ideas and the sustainable design concept.</li></ul>	4–5
<ul style="list-style-type: none"><li><u>simple</u> synthesis by combining ideas and sustainability information to propose a sustainable design concept</li><li><u>feasible</u> evaluation of the strengths and limitations of ideas and sustainable design concept against some design criteria to make adequate refinements.</li></ul>	2–3
<ul style="list-style-type: none"><li><u>unclear</u> combination of ideas</li><li>make statements about ideas or the sustainable design concept.</li></ul>	1
<ul style="list-style-type: none"><li>does not satisfy any of the descriptors above.</li></ul>	0

## Criterion: Representing and communicating

### Assessment objectives

2. represent ideas, a sustainable design concept and sustainability information using schematic sketching and ideation sketching and/or low-fidelity prototyping in the explore and develop phases
7. make decisions about and use visual, written and/or spoken communication to present a design brief and visual display of a design proposal for stakeholders.

The student work has the following characteristics:	Marks
<ul style="list-style-type: none"> <li>• <u>sophisticated</u> representation of ideas, a sustainable design concept and sustainability information using <u>fluent</u> sequences of schematic sketching and ideation sketching and/or low-fidelity prototyping to progress understanding in the explore and develop phases</li> <li>• discerning decision-making about, and fluent use of,               <ul style="list-style-type: none"> <li>– illustrations and/or low-fidelity prototypes to promote a design opportunity with sustainable attributes for relevant stakeholders</li> <li>– written and/or spoken conventions, features and design-specific language to present a design brief for a specified audience.</li> </ul> </li> </ul>	7–8
<ul style="list-style-type: none"> <li>• <u>considered</u> representation of ideas, a sustainable design concept and sustainability information using proficient schematic sketching and ideation sketching and/or low-fidelity prototyping to progress understanding in the explore and develop phases</li> <li>• <u>effective</u> decision-making about, and proficient use of,               <ul style="list-style-type: none"> <li>– illustrations and/or low-fidelity prototypes to promote a design opportunity with sustainable attributes for relevant stakeholders</li> <li>– written and/or spoken conventions, features and design-specific language to present a design brief for a specified audience.</li> </ul> </li> </ul>	5–6
<ul style="list-style-type: none"> <li>• appropriate representation of ideas, a sustainable design concept and sustainability information using schematic sketching and ideation sketching and/or low-fidelity prototyping in the explore and develop phases</li> <li>• appropriate decision-making about and use of               <ul style="list-style-type: none"> <li>– illustrations and/or low-fidelity prototypes to promote a design opportunity</li> <li>– written and/or spoken conventions and features to present a design brief.</li> </ul> </li> </ul>	3–4
<ul style="list-style-type: none"> <li>• <u>cursor</u>y representation of ideas and information using unclear sketching or low-fidelity prototyping in the design process</li> <li>• <u>variable</u> decision-making about, and inconsistent use of,               <ul style="list-style-type: none"> <li>– illustrations and/or low-fidelity prototypes</li> <li>– written and/or spoken conventions.</li> </ul> </li> </ul>	1–2
<ul style="list-style-type: none"> <li>• does not satisfy any of the descriptors above.</li> </ul>	0

## 5.5.2 Summative external assessment (EA): Examination — design challenge (25%)

### General information

Summative external assessment is developed and marked by the QCAA. In Design it contributes 25% to a student's overall subject result.

The external assessment in Design is common to all schools and administered under the same conditions, at the same time, on the same day.

### Description

The examination assesses the application of a range of cognitions to a provided design brief.

The student response must be completed individually, under supervised conditions. Stimulus is unseen.

### Assessment objectives

This assessment technique is used to determine student achievement in the following objectives:

2. represent ideas, and a sustainable design concept using schematic sketching and/or ideation sketching in the develop phase
4. devise ideas using divergent thinking strategies in response to a redesign problem in the develop phase
5. synthesise ideas and sustainability information to propose a sustainable design concept in the develop phase
6. evaluate the strengths, limitations and implications of ideas against design criteria and make refinements.

**Note:** Objectives 1, 3 and 7 are not covered in this assessment.

### Specifications

#### Description

In Design, a design challenge involves students documenting a period of focused design work to meet a deadline. Students use the develop phase of the design process to respond to a provided design brief and stimulus that includes:

- a description of the features and sustainable requirements of a redesign problem
- design criteria that can be used to judge the quality of the design ideas
- visual and written stimulus to support the design brief.

The student response will include the following assessable evidence:

- ideas devised in response to a redesign problem
- evaluation of ideas against design criteria to make refinements
- synthesis of ideas and sustainable information to propose a sustainable design concept
- representation of ideas and a sustainable design concept using schematic and/or ideation sketching.

### **Conditions**

- Time: two hours plus planning (15 minutes)
- Length: four A3 pages
- Equipment required: black ink pen, black felt-tip pen, 2B pencil, sharpener, eraser, ruler, a set of coloured pencils or pens
- Stimulus: unseen

### **Instrument-specific marking guide**

No ISMG is provided for the external assessment.

## 6 Glossary

Term	Explanation
<b>A</b>	
<b>accessible</b>	how well a design communicates its intended function without unnecessary elements, embellishment or decoration
<b>accomplished</b>	highly trained or skilled in a particular activity; perfected in knowledge or training; expert
<b>accuracy</b>	the condition or quality of being true, correct or exact; freedom from error or defect; precision or exactness; correctness; in science, the extent to which a measurement result represents the quantity it purports to measure; an accurate measurement result includes an estimate of the true value and an estimate of the uncertainty
<b>accurate</b>	precise and exact; to the point; consistent with or exactly conforming to a truth, standard, rule, model, convention or known facts; free from error or defect; meticulous; correct in all details
<b>adept</b>	very/highly skilled or proficient at something; expert
<b>adequate</b>	satisfactory or acceptable in quality or quantity equal to the requirement or occasion
<b>aerial view</b>	a sketch depicting an environment or object from a high vantage point, allowing a bird's-eye view of a precinct or landscape
<b>aesthetics</b>	a branch of philosophy dealing with the nature of art, beauty and taste; more scientifically defined as the study of sensory–emotional values, sometimes called judgments of sentiment and taste; aesthetic judgment is concerned with the sensory impact or appeal of a product, service or environment and is influenced by social, emotional and demographic factors; elements and principles of visual communication are used to enhance visual aesthetic
<b>analyse</b>	dissect to ascertain and examine constituent parts and/or their relationships; break down or examine in order to identify the essential elements, features, components or structure; determine the logic and reasonableness of information; examine or consider something in order to explain and interpret it, for the purpose of finding meaning or relationships and identifying patterns, similarities and differences
<b>animation</b>	a series of images that when combined suggest movement; animations are of varying sophistication and may use 2D or 3D imaging; may be images of: an object moving, moving around an object, moving through an environment, parts moving, or moving from external to internal views or vice versa
<b>annotated</b>	made or furnished critical or explanatory notes, or comments to a picture, drawing, sketch or diagram
<b>anthropometric data</b>	information about human body size and shape



Term	Explanation
<b>appearance models</b>	highly detailed representation of appearance using simulated materials
<b>applied learning</b>	the acquisition and application of knowledge, understanding and skills in real-world or lifelike contexts that may encompass workplace, industry and community situations; it emphasises learning through doing and includes both theory and the application of theory, connecting subject knowledge and understanding with the development of practical skills
<b>Applied subject</b>	a subject whose primary pathway is work and vocational education; it emphasises applied learning and community connections; a subject for which a syllabus has been developed by the QCAA with the following characteristics: results from courses developed from Applied syllabuses contribute to the QCE; results may contribute to ATAR calculations
<b>apply</b>	use knowledge and understanding in response to a given situation or circumstance; carry out or use a procedure in a given or particular situation
<b>appraise</b>	evaluate the worth, significance or status of something; judge or consider a text or piece of work
<b>appreciate</b>	recognise or make a judgment about the value or worth of something; understand fully; grasp the full implications of
<b>appropriate</b>	acceptable; suitable or fitting for a particular purpose, circumstance, context etc.
<b>apt</b>	suitable to the purpose or occasion; fitting; appropriate
<b>architects</b>	influence all aspects of the built environment and bring together the arts, environmental awareness, sciences and technology; by combining creative design with technical knowledge, architects create the physical environment in which people live, which in turn influences quality of life; not only do architects inform the overall aesthetics of a city or region by pushing the boundaries of design and style, but they also make invaluable contributions to the quality of life, public health and sustainability of any given region (Australian Institute of Architects)
<b>area of study</b>	a division of, or a section within, a unit
<b>argue</b>	give reasons for or against something; challenge or debate an issue or idea; persuade, prove or try to prove by giving reasons
<b>aspect</b>	a particular part of a feature of something; a facet, phase or part of a whole
<b>assess</b>	measure, determine, evaluate, estimate or make a judgment about the value, quality, outcomes, results, size, significance, nature or extent of something
<b>assessment</b>	purposeful and systematic collection of information about students' achievements
<b>assessment instrument</b>	a tool or device used to gather information about student achievement

Term	Explanation
<b>assessment objectives</b>	drawn from the unit objectives and contextualised for the requirements of the assessment instrument (see also 'syllabus objectives', 'unit objectives')
<b>assessment technique</b>	the method used to gather evidence about student achievement, (e.g. examination, project, investigation)
<b>astute</b>	showing an ability to accurately assess situations or people; of keen discernment
<b>ATAR</b>	Australian Tertiary Admissions Rank
<b>attribute</b>	a quality, character, characteristic, or property
<b>audiences</b>	individuals or groups for whom the response is designed and delivered
<b>augmented reality</b>	digital representations of designs that are superimposed over existing environments
<b>authoritative</b>	able to be trusted as being accurate or true; reliable; commanding and self-confident; likely to be respected and obeyed
<b>B</b>	
<b>balanced</b>	keeping or showing a balance; not biased; fairly judged or presented; taking everything into account in a fair, well-judged way
<b>basic</b>	fundamental
<b>biomimicry</b>	design style; design concepts influenced by biological entities and elements of nature
<b>C</b>	
<b>calculate</b>	determine or find (e.g. a number, answer) by using mathematical processes; obtain a numerical answer showing the relevant stages in the working; ascertain/determine from given facts, figures or information
<b>categorise</b>	place in or assign to a particular class or group; arrange or order by classes or categories; classify; sort out; sort; separate
<b>challenging</b>	difficult but interesting; testing one's abilities; demanding and thought-provoking; usually involving unfamiliar or less familiar elements
<b>characteristic</b>	a typical feature or quality
<b>circular design</b>	a design method where designers consider the future of products, services and environments beyond a single design life cycle for a specific user
<b>clarify</b>	make clear or intelligible; explain; make a statement or situation less confused and more comprehensible
<b>clarity</b>	clearness of thought or expression; the quality of being coherent and intelligible; free from obscurity of sense; without ambiguity; explicit; easy to perceive, understand or interpret
<b>classify</b>	arrange, distribute or order in classes or categories according to shared qualities or characteristics

Term	Explanation
<b>clear</b>	free from confusion, uncertainty or doubt; easily seen, heard or understood
<b>clearly</b>	in a clear manner; plainly and openly; without ambiguity
<b>client</b>	the person, group or community for which the design concepts are made; the client usually has a commercial agreement with the designer and may have specific requirements; the client is often the intermediary between the person who designs the concept and the person involved in production
<b>coherent</b>	having a natural or due agreement of parts; connected; consistent; logical; orderly; well-structured and makes sense; rational, with parts that are harmonious; having an internally consistent relation of parts
<b>cohesive</b>	characterised by being united, bound together or having integrated meaning; forming a united whole
<b>comment</b>	express an opinion, observation or reaction in speech or writing; give a judgment based on a given statement or result of a calculation
<b>commercial</b>	engaged in commerce; capable of returning a profit; setting possible commercial return above artistic considerations
<b>communicate</b>	convey knowledge and/or understandings to others; make known; transmit
<b>community</b>	a group of people who have a particular characteristic in common, such as a church, school, not-for-profit organisation, sporting club or a group of people who have a particular need and therefore require design concepts for many users
<b>compare</b>	display recognition of similarities and differences, and recognise the significance of these similarities and differences
<b>competent</b>	having suitable or sufficient skills, knowledge, experience, etc. for some purpose; adequate but not exceptional; capable; suitable or sufficient for the purpose; having the necessary ability, knowledge or skill to do something successfully; efficient and capable (of a person); acceptable and satisfactory, though not outstanding
<b>competently</b>	in an efficient and capable way; in an acceptable and satisfactory, though not outstanding, way
<b>complex</b>	composed or consisting of many different and interconnected parts or factors; compound; composite; characterised by an involved combination of parts; complicated; intricate; a complex whole or system; a complicated assembly of particulars
<b>comprehend</b>	understand the meaning or nature of; grasp mentally
<b>comprehensive</b>	inclusive; of large content or scope; including or dealing with all or nearly all elements or aspects of something; wide-ranging; detailed and thorough, including all that is relevant
<b>concise</b>	expressing much in few words; giving a lot of information clearly and in a few words; brief, comprehensive and to the point; succinct, clear and without repetition of information

Term	Explanation
<b>concisely</b>	in a way that is brief but comprehensive; expressing much in few words; clearly and succinctly
<b>conduct</b>	direct in action or course; manage; organise; carry out
<b>consider</b>	think deliberately or carefully about something, typically before making a decision; take something into account when making a judgment; view attentively or scrutinise; reflect on
<b>considerable</b>	fairly large or great; thought about deliberately and with a purpose
<b>considered</b>	formed after careful and deliberate thought
<b>consistent</b>	agreeing or accordant; compatible; not self-opposed or self-contradictory, constantly adhering to the same principles; acting in the same way over time, especially so as to be fair or accurate; unchanging in nature, standard or effect over time; not containing any logical contradictions (of an argument); constant in achievement or effect over a period of time
<b>constraints</b>	limitations or restrictions that must be considered and accommodated when developing ideas and design concepts, e.g. teacher-specified limitations, available time, physical realities, legalities
<b>construct</b>	create or put together (e.g. an argument) by arranging ideas or items; display information in a diagrammatic or logical form; make; build
<b>consumer</b>	a person who purchases or uses products, services or environments
<b>contrast</b>	display recognition of differences by deliberate juxtaposition of contrary elements; show how things are different or opposite; give an account of the differences between two or more items or situations, referring to both or all of them throughout
<b>controlled</b>	shows the exercise of restraint or direction over; held in check; restrained, managed or kept within certain bounds
<b>convention</b>	a rule, method, practice or procedure widely observed in a group, especially to facilitate social interaction, and established by general consent or usage
<b>convergent thinking</b>	organising and structuring ideas and information to make decisions leading to a single best outcome; often used after a period of divergent thinking to identify the best way forward; making choices
<b>convincing</b>	persuaded by argument or proof; leaving no margin of doubt; clear; capable of causing someone to believe that something is true or real; persuading or assuring by argument or evidence; appearing worthy of belief; credible or plausible
<b>copyright</b>	intellectual property right that protects the original expression of ideas, not the ideas themselves
<b>course</b>	a defined amount of learning developed from a subject syllabus

Term	Explanation
<b>create</b>	bring something into being or existence; produce or evolve from one's own thought or imagination; reorganise or put elements together into a new pattern or structure or to form a coherent or functional whole
<b>creative</b>	resulting from originality of thought or expression; relating to or involving the use of the imagination or original ideas to create something; having good imagination or original ideas
<b>credible</b>	capable or worthy of being believed; believable; convincing
<b>criterion</b>	the property or characteristic by which something is judged or appraised
<b>critical</b>	involving skilful judgment as to truth, merit, etc.; involving the objective analysis and evaluation of an issue in order to form a judgment; expressing or involving an analysis of the merits and faults of a work of literature, music or art; incorporating a detailed and scholarly analysis and commentary (of a text); rationally appraising for logical consistency and merit
<b>critique</b>	review (e.g. a theory, practice, performance) in a detailed, analytical and critical way
<b>cultural</b>	relating to the collective accepted practices of a group of human beings associated with a specified characteristic
<b>curate</b>	to make a decision to select, organise and present particular features
<b>cursory</b>	hasty and therefore not thorough or detailed; performed with little attention to detail; going rapidly over something, without noticing details; hasty, superficial
<b>D</b>	
<b>decide</b>	reach a resolution as a result of consideration; make a choice from a number of alternatives
<b>deduce</b>	reach a conclusion that is necessarily true, provided a given set of assumptions is true; arrive at, reach or draw a logical conclusion from reasoning and the information given
<b>defensible</b>	justifiable by argument; capable of being defended in argument
<b>define</b>	give the meaning of a word, phrase, concept or physical quantity; state meaning and identify or describe qualities
<b>demonstrate</b>	prove or make clear by argument, reasoning or evidence, illustrating with practical example; show by example; give a practical exhibition
<b>derive</b>	arrive at by reasoning; manipulate a mathematical relationship to give a new equation or relationship
<b>describe</b>	give an account (written or spoken) of a situation, event, pattern or process, or of the characteristics or features of something

Term	Explanation
<b>design</b>	<p>produce a plan, simulation, model or similar; plan, form or conceive in the mind;</p> <p>in English, select, organise and use particular elements in the process of text construction for particular purposes; these elements may be linguistic (words), visual (images), audio (sounds), gestural (body language), spatial (arrangement on the page or screen) and multimodal (a combination of more than one);</p> <p>in Design, a process of exploring and developing a response to needs, wants and opportunities that require the balancing of aesthetic, cultural, economic, social and technical features</p>
<b>design approach</b>	a way of using the design process relevant to a particular unit, e.g. collaborative designing, designing with empathy, redesigning
<b>design brief</b>	a concise description of the features of a problem that clarifies the need, want or opportunity to be resolved; indicates the ways forward to solving the problem; provides a basis from which students can apply some or all of the stages of the design process
<b>design challenge</b>	an assessment technique; an examination that requires students to design a response to a design problem in a period of focused design work to meet a deadline
<b>design concepts</b>	possible solutions to a design problem; synthesised ideas that result from the progression of multiple ideas; proposed in response to a design brief and satisfy design criteria; visualised using drawing and low-fidelity prototyping
<b>design context</b>	a focus related to real-world design situations that requires students to consider new knowledge and approaches to designing; the contexts used in this syllabus are limited to commercial design, human-centred design and sustainable design
<b>design criteria</b>	provide explicit information to enable the evaluation of the appropriateness of design ideas and concepts; are identified by investigating stakeholders' needs and wants together with the principles of good design
<b>design information</b>	declarative knowledge about design acted on by the cognitive, metacognitive and self-systems; includes data about stakeholders, existing designs and related aesthetic, cultural, economic, social and technical influences
<b>design problems</b>	difficulties, obstacles or challenges defined as a result of exploring a need, want or opportunity; require the application of a design process to balance aesthetic, cultural, economic, social and technical features when developing design concepts in response to the problem; may be defined and described by the teacher or student depending on the stage of the course and the teaching, learning and assessment purpose
<b>design process</b>	<p>used to solve design problems;</p> <p>it is iterative, emphasising the recursive and reflective nature of design;</p> <p>more than one design process exists and similarities exist in all design processes; various design processes are accepted practice</p>
<b>design styles</b>	characterised by attributes that make a design notable and historically identifiable; evolve slowly over time, reflecting changing fashions and new ideas

Term	Explanation
<b>design thinking</b>	thinking process of a designer engaged in the activity of design; visualising and devising creative ideas, and evaluating those ideas that best meet the criteria for success; includes divergent and convergent thinking; divergent thinking supports creativity and the devising of a range of ideas, and convergent thinking supports the selection of a preferred concept
<b>designed solution</b>	a product, service or environment that has been created for a specific purpose or intention as a result of design thinking, design processes and production processes
<b>designers</b>	people who plan the look or workings of something prior to it being made; include architects, digital media designers, fashion designers, graphic designers, industrial designers, interior designers and landscape architects (Design Institute of Australia, Australian Institute of Architects)
<b>detailed</b>	executed with great attention to the fine points; meticulous; including many of the parts or facts; related to the elaboration of creative ideas (Torrance, 1998)
<b>determine</b>	establish, conclude or ascertain after consideration, observation, investigation or calculation; decide or come to a resolution
<b>develop</b>	a phase of the design process that includes divergent and convergent thinking to devise ideas and synthesise design concepts; elaborate, expand or enlarge in detail; add detail and fullness to; cause to become more complex or intricate
<b>development</b>	two-dimensional drawings that depict the true shape of the surface of a three-dimensional object and often contain detail about folding and transitions from different shapes; also called a net or pattern
<b>devise</b>	think out; plan; contrive; invent
<b>diagrams</b>	abstract symbolic representations used to organise information, ideas or objects according to some visualisation technique; often 2D and geometric; symbols, charts, graphs and maps are forms of diagrams
<b>differentiate</b>	identify the difference/s in or between two or more things; distinguish; discriminate; recognise or ascertain what makes something distinct from similar things; in mathematics, obtain the derivative of a function
<b>digital disruption</b>	a change as a result of new digital technologies that affects the value proposition of existing products, services and environments
<b>digital media designers</b>	develop and prepare information (text, symbols, colours, pictures, animation, video and sound) for either digital interactive or digital sequential audience requirements; designers work on the user interface (UI), which mostly refers to how users navigate through complex digital experiences, and user experience (UX), or the total experience of the user as they move through a website or application (app); includes games designers, website designers, multimedia designers, app designers
<b>digital low-fidelity prototype</b>	a category of low-fidelity prototyping; includes interactive or sequential experiences
<b>digital presentation</b>	presentation software to communicate design ideas in sequence



Term	Explanation
<b>discerning</b>	discriminating; showing intellectual perception; showing good judgment; making thoughtful and astute choices; selected for value or relevance
<b>discriminate</b>	note, observe or recognise a difference; make or constitute a distinction in or between; differentiate; distinguish as different
<b>discriminating</b>	differentiating; distinctive; perceiving differences or distinctions with nicety; possessing discrimination; perceptive and judicious; making judgments about quality; having or showing refined taste or good judgment
<b>discuss</b>	examine by argument; sift the considerations for and against; debate; talk or write about a topic, including a range of arguments, factors or hypotheses; consider, taking into account different issues and ideas, points for and/or against, and supporting opinions or conclusions with evidence
<b>disjointed</b>	disconnected; incoherent; lacking a coherent order/sequence or connection
<b>distinguish</b>	recognise as distinct or different; note points of difference between; discriminate; discern; make clear a difference/s between two or more concepts or items
<b>divergent thinking</b>	generate creative ideas by exploring many possible concepts; creating choices
<b>diverse</b>	of various kinds or forms; different from each other
<b>document</b>	support (e.g. an assertion, claim, statement) with evidence (e.g. decisive information, written references, citations)
<b>draw conclusions</b>	make a judgment based on reasoning and evidence
<b>drawings</b>	representation by lines used to represent abstract ideas, and 2D and 3D objects; produced manually or software assisted; may be informal or formal
<b>E</b>	
<b>economic</b>	a feature of a design problem concerning for example costs, time, client expectations of quality
<b>effective</b>	successful in producing the intended, desired or expected result; meeting the assigned purpose
<b>efficient</b>	working in a well-organised and competent way; maximum productivity with minimal expenditure of effort; acting or producing effectively with a minimum of waste, expense or unnecessary effort
<b>element</b>	a component or constituent part of a complex whole; a fundamental, essential or irreducible part of a composite entity
<b>elementary</b>	simple or uncompounded; relating to or dealing with elements, rudiments or first principles (of a subject); of the most basic kind; straightforward and uncomplicated



Term	Explanation
<b>elements and principles of visual communication</b>	the elements form the basic components of visual communication; they are acted upon by principles that are ways of arranging or organising the elements; principles are things that can be repeatedly and dependably done with elements to produce some sort of visual effect
<b>elevations</b>	a drawing of a single view such as a front, rear or side view of an object or environment
<b>empathy map</b>	used to gain a deeper insight into stakeholders; a stakeholder is depicted in the middle of a page surrounded by topics such as think and feel, see, hear, say and do, pain and gain
<b>end user</b>	the person, group or community that uses the product
<b>environment</b>	a designed solution; a place or space; may be constructed or digital; related to architecture, interior design, landscape architecture, digital media design
<b>environmental sustainability</b>	practices that have minimal impact on ecosystems' health, allow renewal of natural systems and value environmental qualities that support life
<b>ergonomics</b>	understanding of the activity of humans to maximise their wellbeing and their productive use of products, services or systems; concerned with physical, mental and emotional impacts on users of the design concept
<b>erroneous</b>	based on or containing error; mistaken; incorrect
<b>essential</b>	absolutely necessary; indispensable; of critical importance for achieving something
<b>ethics</b>	moral principles that govern the behaviour of a person or group
<b>evaluate</b>	make an appraisal by weighing up or assessing strengths, implications and limitations; make judgments about ideas, works, solutions or methods in relation to selected criteria; examine and determine the merit, value or significance of something, based on criteria
<b>examination</b>	a supervised test that assesses the application of a range of cognitions to one or more provided items such as questions, scenarios and/or problems; student responses are completed individually, under supervised conditions, and in a set timeframe
<b>examine</b>	investigate, inspect or scrutinise; inquire or search into; consider or discuss an argument or concept in a way that uncovers the assumptions and interrelationships of the issue
<b>experiment</b>	try out or test new ideas or methods, especially in order to discover or prove something; undertake or perform a scientific procedure to test a hypothesis, make a discovery or demonstrate a known fact
<b>explain</b>	make an idea or situation plain or clear by describing it in more detail or revealing relevant facts; give an account; provide additional information
<b>explanatory sketch</b>	three-dimensional representations that show the relationship between parts of an object or idea; may also be referred to as exploded or open and in line for assembly

Term	Explanation
<b>explicit</b>	clearly and distinctly expressing all that is meant; unequivocal; clearly developed or formulated; leaving nothing merely implied or suggested
<b>explore</b>	look into both closely and broadly; scrutinise; inquire into or discuss something in detail; in Design, a phase of the design process that requires an inquiry into human needs, wants and opportunities to define a design problem; includes investigation and analysis
<b>express</b>	convey, show or communicate (e.g. a thought, opinion, feeling, emotion, idea or viewpoint) in words, art, music or movement, convey or suggest a representation of; depict
<b>extended response</b>	an open-ended assessment technique that focuses on the interpretation, analysis, examination and/or evaluation of ideas and information in response to a particular situation or stimulus; while students may undertake some research when writing of an extended response, it is not the focus of this technique; an extended response occurs over an extended and defined period of time
<b>Extension subject</b>	a two-unit subject (Units 3 and 4), for which a syllabus has been developed by the QCAA, that is an extension of one or more General subject/s and studied concurrently with, or after the completion of, Units 3 and 4 of that subject
<b>extensive</b>	of great extent; wide; broad; far-reaching; comprehensive; lengthy; detailed; large in amount or scale
<b>external assessment</b>	summative assessment that occurs towards the end of a course of study and is common to all schools; developed and marked by the QCAA according to a commonly applied marking scheme
<b>external examination</b>	a supervised test, developed and marked by the QCAA, that assesses the application of a range of cognitions to multiple provided items such as questions, scenarios and/or problems; student responses are completed individually, under supervised conditions, and in a set timeframe
<b>extrapolate</b>	infer or estimate by extending or projecting known information; conjecture; infer from what is known; extend the application of something (e.g. a method or conclusion) to an unknown situation by assuming that existing trends will continue or similar methods will be applicable
<b>extrapolation</b>	modifying existing designs in some straightforward way
<b>F</b>	
<b>factual</b>	relating to or based on facts; concerned with what is actually the case; actually occurring; having verified existence
<b>familiar</b>	well-acquainted; thoroughly conversant with; well known from long or close association; often encountered or experienced; common; (of materials, texts, skills or circumstances) having been the focus of learning experiences or previously encountered in learning activities

Term	Explanation
<b>fashion designers</b>	influence the design and development of clothing, accessories, footwear and other items of personal apparel; consider historical development and styles, and rely heavily on illustration skills and the making of samples to communicate designs; meet marketing, manufacturing and financial requirements to arrive at the optimum design; consider both functional and aesthetic aspects and pay particular attention to relationship of the apparel to the human form (Design Institute of Australia)
<b>feasible</b>	capable of being achieved, accomplished or put into effect; reasonable enough to be believed or accepted; probable; likely
<b>features</b>	distinctive attributes, characteristics, properties or qualities of something
<b>flat drawings</b>	used in fashion to represent garment details
<b>flow chart</b>	a diagram that shows step-by-step progression through a procedure or system especially using connecting lines, arrows and a set of conventional symbols
<b>fluent</b>	spoken or written with ease; able to speak or write smoothly, easily or readily; articulate; eloquent; in artistic performance, characteristic of a highly developed and excellently controlled technique; polished; flowing smoothly, easily and effortlessly
<b>fluently</b>	in a graceful and seemingly effortless manner; in a way that progresses smoothly and readily
<b>form study</b>	rough arrangement of form to allow early exploration of design ideas
<b>formative assessment</b>	assessment whose major purpose is to improve teaching and student achievement
<b>fragmented</b>	disorganised; broken down; disjointed or isolated
<b>frequent</b>	happening or occurring often at short intervals; constant, habitual, or regular
<b>functional relationships diagram</b>	freehand drawings that use bubbles and diagrammatic symbols to graphically depict the functions and relationships of adjacent elements of a design
<b>fundamental</b>	forming a necessary base or core; of central importance; affecting or relating to the essential nature of something; part of a foundation or basis
<b>G</b>	
<b>gap in the market</b>	an unmet stakeholder need or want or a group people who are not yet using an existing product, service or environment; represent opportunities for companies to increase awareness to reach an untapped market
<b>General subject</b>	a subject for which a syllabus has been developed by the QCAA with the following characteristics: results from courses developed from General syllabuses contribute to the QCE; General subjects have an external assessment component; results may contribute to ATAR calculations

Term	Explanation
<b>generate</b>	produce; create; bring into existence
<b>good design</b>	see 'principles of good design'
<b>graphic designers</b>	develop and prepare information for physical or digital publication with particular emphasis on clarity of visual communication and the matching of information to audience requirements; use text-based communication and symbols, colours and pictures (Design Institute of Australia)
<b>graphic organiser</b>	a visualisation method that uses visual symbols to represent structured thinking; graphic organisers make thinking processes visible by showing connections between ideas and data; examples include concept maps, flow charts and cause-and-effect patterns
<b>graphics software</b>	used for the production of 2D imagery specifically for graphic design purposes; some packages are vector graphics — based and used to produce images that do not lose clarity during magnification or reduction (lossless format) for the construction of logos, stationery, etc.; other packages are raster graphics — based and used in the manipulation of photographs and other images with graduated colourings and tones; raster images, due to the fact that they rely on the differentiation of pixel colour, can lose clarity during magnification or reduction (lossy format)
<b>H</b>	
<b>human</b>	relating to or characteristic of people; characterised by the weaknesses and faults of ordinary people
<b>hypothesise</b>	formulate a supposition to account for known facts or observed occurrences; conjecture, theorise, speculate, especially on uncertain or tentative grounds
<b>I</b>	
<b>ideas</b>	thoughts, notions or suggestions as to a possible course of action
<b>idea sketch</b>	generated freehand as quick representations of conceptual ideas; instantly captures an idea visualised in the mind for later use and therefore lacks presentation quality; may be whole or part of an envisaged idea; usually in pencil using lines and very basic rendering
<b>ideation</b>	a category of drawing; representations of mental images that aid in the exploration and development of design ideas; such sketches may be very informal and conceptual or relatively accurate, but their purpose is the rapid devising and testing of design ideas
<b>identify</b>	distinguish; locate, recognise and name; establish or indicate who or what someone or something is; provide an answer from a number of possibilities; recognise and state a distinguishing factor or feature
<b>illogical</b>	lacking sense or sound reasoning; contrary to or disregarding of the rules of logic; unreasonable

Term	Explanation
<b>illustration</b>	a category of drawing; may be produced using manual freehand techniques or software assisted; used to communicate what a refined design concept would look like; often includes colour, rendering and contextual features such as backgrounds; usually produced using pencil, ink and markers; may be a pictorial view or orthographic view
<b>impact</b>	a marked effect or influence, e.g. social impact results in immediate or noticeable change; digital disruption
<b>implement</b>	put something into effect, e.g. a plan or proposal
<b>implicit</b>	implied, rather than expressly stated; not plainly expressed; capable of being inferred from something else
<b>improbable</b>	not probable; unlikely to be true or to happen; not easy to believe
<b>inaccurate</b>	not accurate
<b>inappropriate</b>	not suitable or proper in the circumstances
<b>inconsistent</b>	lacking agreement, as one thing with another, or two or more things in relation to each other; at variance; not consistent; not in keeping; not in accordance; incompatible; incongruous
<b>independent</b>	thinking or acting for oneself, not influenced by others
<b>in-depth</b>	comprehensive and with thorough coverage; extensive or profound; well-balanced or fully developed
<b>infer</b>	derive or conclude something from evidence and reasoning, rather than from explicit statements; listen or read beyond what has been literally expressed; imply or hint at
<b>informed</b>	knowledgeable; learned; having relevant knowledge; being conversant with the topic; based on an understanding of the facts of the situation (of a decision or judgment)
<b>innovative</b>	new and original; introducing new ideas; original and creative in thinking
<b>insightful</b>	showing understanding of a situation or process; understanding relationships in complex situations; informed by observation and deduction
<b>instrument-specific marking guide</b>	ISMG; a tool for marking that describes the characteristics evident in student responses and aligns with the identified objectives for the assessment (see 'assessment objectives')
<b>integral</b>	<i>adjective</i> necessary for the completeness of the whole; essential or fundamental; <i>noun</i> in mathematics, the result of integration; an expression from which a given function, equation or system of equations is derived by differentiation
<b>intellectual property</b>	a legal concept that refers to creations of a mind for which exclusive rights are recognised; common types of intellectual property include copyright, trademarks, patents and designs

Term	Explanation
<b>intended</b>	designed; meant; done on purpose; intentional
<b>interactive</b>	a form of digital prototype that simulates the two-way flow of information between a computer and user; website or mobile application simulation
<b>interface wireframe</b>	conceptual representations of interfaces lacking media assets suitable for early testing
<b>internal assessment</b>	assessments that are developed by schools; summative internal assessments are endorsed by the QCAA before use in schools, and results are externally confirmed and contribute towards a student's final result
<b>interpret</b>	use knowledge and understanding to recognise trends and draw conclusions from given information; make clear or explicit; elucidate or understand in a particular way; bring out the meaning of, e.g. a dramatic or musical work, by performance or execution; bring out the meaning of an artwork by artistic representation or performance; give one's own interpretation of; identify or draw meaning from, or give meaning to, information presented in various forms, such as words, symbols, pictures or graphs
<b>invention</b>	combining existing ideas in new ways
<b>investigate</b>	carry out an examination or formal inquiry in order to establish or obtain facts and reach new conclusions; search, inquire into, interpret and draw conclusions about data and information
<b>investigation</b>	an assessment technique that requires students to research a specific problem, question, issue, design challenge or hypothesis through the collection, analysis and synthesis of primary and/or secondary data; it uses research or investigative practices to assess a range of cognitions in a particular context; an investigation occurs over an extended and defined period of time
<b>irrelevant</b>	not relevant; not applicable or pertinent; not connected with or relevant to something
<b>ISMG</b>	instrument-specific marking guide; a tool for marking that describes the characteristics evident in student responses and aligns with the identified objectives for the assessment (see 'assessment objectives')
<b>isolated</b>	detached, separate or unconnected with other things; one-off; something set apart or characterised as different in some way
<b>isometric sketch</b>	a pictorial representation of a product or environment
<b>iterative</b>	recursive; revisiting earlier parts of a process to further clarify meaning or refine ideas and concepts
<b>J</b>	
<b>judge</b>	form an opinion or conclusion about; apply both procedural and deliberative operations to make a determination
<b>junk model</b>	rough physical model created from sundry available resources used for gauging size, proportion or ergonomics

Term	Explanation
<b>justified</b>	sound reasons or evidence are provided to support an argument, statement or conclusion
<b>justify</b>	give reasons or evidence to support an answer, response or conclusion; show or prove how an argument, statement or conclusion is right or reasonable
<b>L</b>	
<b>layout</b>	a scheme for the arrangement of text and visual assets on a screen or page
<b>learning area</b>	a grouping of subjects, with related characteristics, within a broad field of learning, e.g. the Arts, sciences, languages
<b>line drawing</b>	a drawing done using only narrow lines, without blocks of shading
<b>logical</b>	rational and valid; internally consistent; reasonable; reasoning in accordance with the principles/rules of logic or formal argument; characterised by or capable of clear, sound reasoning; (of an action, decision, etc.) expected or sensible under the circumstances
<b>logically</b>	according to the rules of logic or formal argument; in a way that shows clear, sound reasoning; in a way that is expected or sensible
<b>low-fidelity prototyping</b>	used throughout the design process to quickly and simply move ideas and design concepts from abstract to reality to clarify understanding and inform further exploration and development; a simple, non-functional, three-dimensional, digital interactive or digital sequential representation using basic processes, materials or software that may be unrelated to how a final designed solution is produced, e.g. stop-motion animation of a mobile application rather than a coded solution or clay models of a handheld item to confirm the application of ergonomic data about a user's grip; algorithms to represent coding and sketches to represent user interface
<b>M</b>	
<b>make decisions</b>	select from available options; weigh up positives and negatives of each option and consider all the alternatives to arrive at a position
<b>manipulate</b>	adapt or change to suit one's purpose
<b>maquette</b>	an experimental representation of a product or environment (a word borrowed from sculpture but with altered meaning)
<b>massing model</b>	rough study of volumes; used in architecture
<b>mental procedures</b>	a domain of knowledge in Marzano's taxonomy and acted upon by the cognitive, metacognitive and self-systems; sometimes referred to as 'procedural knowledge'; there are three distinct phases to the acquisition of mental procedures: the cognitive stage, the associative stage and the autonomous stage; the two categories of mental procedures are skills (single rules, algorithms and tactics) and processes (macroprocedures)

Term	Explanation
<b>methodical</b>	performed, disposed or acting in a systematic way; orderly; characterised by method or order; performed or carried out systematically
<b>mind map</b>	a purposeful diagram used to visually organise information; allows the abstract relationships between ideas to be explored and refined; visual representations may include images, words and parts of words; usually a central idea or concept is placed in the middle and associated ideas arranged around
<b>minimal</b>	least possible; small; the least amount; negligible
<b>mobile application</b>	a type of software application that uses hardware functionality and runs on a mobile device, such as a smartphone or tablet computer; often provides users with similar services to those accessed on desktop computers
<b>mock-ups</b>	arrangements of text and pictures to be printed; models or replicas of an object, used for demonstration, evaluation, promotion purposes
<b>model</b>	a physical or digital representation of an idea or design concept that describes, simplifies, clarifies or provides an explanation of an idea or design concept
<b>modify</b>	change the form or qualities of; make partial or minor changes to something
<b>motion graphics</b>	sequential representations of images and sound; video; animation; digital multimedia presentation
<b>multimodal</b>	uses a combination of at least two modes (e.g. spoken, written), delivered at the same time, to communicate ideas and information to a live or virtual audience for a particular purpose; the selected modes are integrated so that each mode contributes significantly to the response
<b>multiple</b>	consisting of, having, or involving a great number of individuals, parts, elements, relations; numerous; related to the fluency of creative ideas, as many ideas as possible (Torrance, 1998)
<b>N</b>	
<b>narrow</b>	limited in range or scope; lacking breadth of view; limited in amount; barely sufficient or adequate; restricted
<b>nuanced</b>	showing a subtle difference or distinction in expression, meaning, response, etc.; finely differentiated; characterised by subtle shades of meaning or expression; a subtle distinction, variation or quality; sensibility to, awareness of, or ability to express delicate shadings, as of meaning, feeling or value
<b>O</b>	
<b>objectives</b>	see 'syllabus objectives', 'unit objectives', 'assessment objectives'
<b>objects</b>	something that may be perceived by the senses, especially by sight or touch; a visible or tangible thing; household products, fashion items, furniture, buildings, structures
<b>obvious</b>	clearly perceptible or evident; easily seen, recognised or understood



Term	Explanation
<b>open-ended problems</b>	loosely structured and complex, having no one correct solution or solution path and requiring students to comprehend and apply a breadth and depth of knowledge during problem-solving
<b>optimal</b>	best; most favourable under a particular set of circumstances
<b>organisational diagram</b>	a diagram of relationships between people, roles or objects in a system
<b>organise</b>	arrange; order; form as or into a whole consisting of interdependent or coordinated parts, especially for harmonious or united action
<b>organised</b>	systematically ordered and arranged; having a formal organisational structure to arrange, coordinate and carry out activities
<b>orthographic</b>	views that describe the form of a three-dimensional object projected onto two-dimensional planes; often used to communicate a refined design concept
<b>outstanding</b>	exceptionally good; clearly noticeable; prominent; conspicuous; striking
<b>P</b>	
<b>partial</b>	not total or general; existing only in part; attempted, but incomplete
<b>particular</b>	distinguished or different from others or from the ordinary; noteworthy
<b>patent</b>	an intellectual property right granted for any device, substance, method or process that is new, inventive and useful
<b>pattern</b>	arrangement of parts to be cut from a flat sheet of material
<b>perceptive</b>	having or showing insight and the ability to perceive or understand; discerning (see also 'discriminating')
<b>performance</b>	an assessment technique that requires students to demonstrate a range of cognitive, technical, creative and/or expressive skills and to apply theoretical and conceptual understandings, through the psychomotor domain; it involves student application of identified skills when responding to a task that involves solving a problem, providing a solution or conveying meaning or intent; a performance is developed over an extended and defined period of time
<b>perspective</b>	a representation of a product or environment as seen by the human eye
<b>persuasive</b>	capable of changing someone's ideas, opinions or beliefs; appearing worthy of approval or acceptance; (of an argument or statement) communicating reasonably or credibly (see also 'convincing')
<b>perusal time</b>	time allocated in an assessment to reading items and tasks and associated assessment materials; no writing is allowed; students may not make notes and may not commence responding to the assessment in the response space/book

Term	Explanation
<b>physical low-fidelity prototype</b>	a category of low-fidelity prototyping; three-dimensional, generated by cutting, joining and forming materials such as paper, card, wood, glass, metal, clay, plastic and textile
<b>pictorial sketch</b>	a sketch that allows experimentation with the appearance of an object or environment
<b>pitch</b>	a short spoken and visual presentation used by designers to communicate the strengths, limitations and implications of a design concept; may be for a live or virtual audience
<b>planning time</b>	time allocated in an assessment to planning how to respond to items and tasks and associated assessment materials; students may make notes but may not commence responding to the assessment in the response space/book; notes made during planning are not collected, nor are they graded or used as evidence of achievement
<b>plausible</b>	credible and possible
<b>points of view</b>	mental positions or viewpoints; related to the flexibility of creative ideas (Torrance, 1998)
<b>polished</b>	flawless or excellent; performed with skilful ease
<b>precise</b>	definite or exact; definitely or strictly stated, defined or fixed; characterised by definite or exact expression or execution
<b>precision</b>	accuracy; exactness; exact observance of forms in conduct or actions
<b>predict</b>	give an expected result of an upcoming action or event; suggest what may happen based on available information
<b>presentation sketches and drawings</b>	intended to explain a design concept and to promote its merits; usually includes rendering to add surface textures, colour, shadows and/or reflections to show the visual qualities of a design more realistically
<b>primary data</b>	includes information in its most original and authentic form taken from observations, interviews, questionnaires and experiments
<b>principles</b>	specific types of generalisations that deal with relationships; a proposition that serves as the foundation for a system of belief or behaviour or for a chain of reasoning
<b>principles of good design</b>	innovative, useful, aesthetic, accessible, enduring, sustainable; derived from Dieter Rams' 'Ten principles of good design' (Vitsoe 2017) and Good Design Australia ( <a href="http://www.gooddesignaustralia.com">www.gooddesignaustralia.com</a> )
<b>problem-based learning</b>	an active, constructivist process that incorporates the use of open-ended problems as a stimulus for student learning
<b>product</b>	an assessment technique that focuses on the output or result of a process requiring the application of a range of cognitive, physical, technical, creative and/or expressive skills, and theoretical and conceptual understandings; a product is developed over an extended and defined period of time in Technologies, a designed solution; a tangible end result of a human, construction, mechanical, manufacturing or digital process; created by practical application of knowledge and skills;

Term	Explanation
<b>proficient</b>	well advanced or expert in any art, science or subject; competent, skilled or adept in doing or using something
<b>progress</b>	development towards an improved or more advanced outcome; to refine an idea or design concept
<b>project</b>	an assessment technique that focuses on a problem-solving process requiring the application of a range of cognitive, technical and creative skills, and theoretical understandings; the response is a coherent work that documents the iterative process undertaken to develop a solution and includes written paragraphs and notes, diagrams, sketches, drawings, photographs, video, spoken presentations, low-fidelity prototypes; a project is developed over an extended and defined period of time
<b>proof of concept</b>	a form of prototype used to test the feasibility of an idea; usually small or representative of an aspect or part of a bigger idea; may not be complete
<b>propose</b>	put forward (e.g. a point of view, idea, argument, suggestion) for consideration or action
<b>prove</b>	use a sequence of steps to obtain the required result in a formal way
<b>psychomotor procedures</b>	a domain of knowledge in Marzano's taxonomy, and acted upon by the cognitive, metacognitive and self-systems; these are physical procedures used to negotiate daily life and to engage in complex physical activities; the two categories of psychomotor procedures are skills (foundational procedures and simple combination procedures) and processes (complex combination procedures)
<b>purposeful</b>	having an intended or desired result; having a useful purpose; determined; resolute; full of meaning; significant; intentional
<b>Q</b>	
<b>QCE</b>	Queensland Certificate of Education
<b>R</b>	
<b>realise</b>	create or make (e.g. a musical, artistic or dramatic work); actualise; make real or concrete; give reality or substance to
<b>reasonable</b>	endowed with reason; having sound judgment; fair and sensible; based on good sense; average; appropriate; moderate
<b>reasoned</b>	logical and sound; based on logic or good sense; logically thought out and presented with justification; guided by reason; well-grounded; considered
<b>recall</b>	remember; present remembered ideas, facts or experiences; bring something back into thought, attention or into one's mind
<b>recognise</b>	identify or recall particular features of information from knowledge; identify that an item, characteristic or quality exists; perceive as existing or true; be aware of or acknowledge
<b>refined</b>	developed or improved so as to be precise, exact or subtle
<b>reflect on</b>	think about deeply and carefully

Term	Explanation
<b>rehearsed</b>	practised; previously experienced; practised extensively
<b>related</b>	associated with or linked to
<b>relevance</b>	being related to the matter at hand
<b>relevant</b>	bearing upon or connected with the matter in hand; to the purpose; applicable and pertinent; having a direct bearing on
<b>rendered drawing</b>	a fairly realistic depiction of the appearance of an object, place or design intended to communicate design intent to the layperson, such as a client or user
<b>rendered sketch</b>	a partially or fully coloured simulation of the appearance of an object or place
<b>repetitive</b>	containing or characterised by repetition, especially when unnecessary or tiresome
<b>reporting</b>	providing information that succinctly describes student performance at different junctures throughout a course of study
<b>represent</b>	portray or depict in some type of non-linguistic form to comprehend knowledge
<b>requirements</b>	to wish to have; identified from stakeholders' needs and wants related to aesthetic, cultural, economic, social and technical features; used to inform criteria against which to evaluate
<b>resolve</b>	in the Arts, consolidate and communicate intent through a synthesis of ideas and application of media to express meaning
<b>routine</b>	often encountered, previously experienced; commonplace; customary and regular; well-practised; performed as part of a regular procedure, rather than for a special reason
<b>rudimentary</b>	relating to rudiments or first principles; elementary; undeveloped; involving or limited to basic principles; relating to an immature, undeveloped or basic form
<b>S</b>	
<b>safe</b>	secure; not risky
<b>scale models</b>	small-scaled representations of environments or objects that can't practically be built during the design of a project
<b>schematic</b>	a category of drawing; an abstract representation that aids in the conceptualisation of relationships between design information and aspects of design ideas; schematic sketches may be used to record and analyse knowledge and data
<b>sculpture</b>	three-dimensional free-form representation of products using the removal or addition of material
<b>secondary data</b>	includes published data from books, magazines, newspapers, journals and periodicals; electronic data such as documentaries; government records such as surveys, records, census data and other statistical reports; internet resources
<b>sections</b>	allow internal and external features to be considered simultaneously

Term	Explanation
<b>secure</b>	sure; certain; able to be counted on; self-confident; poised; dependable; confident; assured; not liable to fail
<b>select</b>	choose in preference to another or others; pick out
<b>sensitive</b>	capable of perceiving with a sense or senses; aware of the attitudes, feelings or circumstances of others; having acute mental or emotional sensibility; relating to or connected with the senses or sensation
<b>sequence</b>	place in a continuous or connected series; arrange in a particular order
<b>sequential</b>	a form of digital prototype that simulates the presentation of information by a computer using images, text and sound; motion graphics
<b>service</b>	a designed solution; a less tangible outcome (compared to products) of processes to meet a need or want; services may involve development or maintenance of a system, e.g. cloud computing (software as a service), communication, transportation and water management; services can be communicated by charts, diagrams, models, posters and procedures
<b>show</b>	provide the relevant reasoning to support a response
<b>side and top views</b>	informal drawings employed for conceptual development of objects
<b>significant</b>	important; of consequence; expressing a meaning; indicative; includes all that is important; sufficiently great or important to be worthy of attention; noteworthy; having a particular meaning; indicative of something
<b>simple</b>	easy to understand, deal with and use; not complex or complicated; plain; not elaborate or artificial; may concern a single or basic aspect; involving few elements, components or steps
<b>simplistic</b>	characterised by extreme simplification, especially if misleading; oversimplified
<b>simulation</b>	the representation of a product, service or environment that imitates a real or idealised situation
<b>sketch</b>	execute a drawing or painting in simple form, giving essential attributes but not necessarily with detail or accuracy; in mathematics, represent by means of a diagram or graph; the sketch should give a general idea of the required shape or relationship and should include attributes in Technologies, a two-dimensional informal visualisation method completed freehand, often instantly capturing an idea for later use and therefore lacking in presentation quality; sketches are usually produced manually, using pencil, ink and paper, but may be software-assisted
<b>sketch plan</b>	informal drawing employed for conceptual floor plan ideation and development

Term	Explanation
<b>skilful</b>	having technical facility or practical ability; possessing, showing, involving or requiring skill; expert; dexterous; demonstrating the knowledge, ability or training to perform a certain activity or task well; trained, practised or experienced
<b>skilled</b>	having or showing the knowledge, ability or training to perform a certain activity or task well; having skill; trained or experienced; showing, involving or requiring skill
<b>social</b>	a feature of a design problem concerning fashions, trends, tastes, demographics
<b>solve</b>	find an answer to, explanation for or means of dealing with (e.g. a problem); work out the answer or solution to (e.g. a mathematical problem); obtain the answer/s using algebraic, numerical and/or graphical methods
<b>sophisticated</b>	of intellectual complexity; reflecting a high degree of skill, intelligence, etc.; employing advanced or refined methods or concepts; highly developed or complicated
<b>specific</b>	clearly defined or identified; precise and clear in making statements or issuing instructions; having a special application or reference; explicit or definite; peculiar or proper to something, as qualities, characteristics, effects, etc.
<b>spoken communication</b>	includes verbal and non-verbal features and may be for live or virtual audiences
<b>sporadic</b>	happening now and again or at intervals; irregular or occasional; appearing in scattered or isolated instances
<b>stakeholders</b>	people or groups with an interest or concern in the design process, such as users, designers, consumers, audience and clients
<b>straightforward</b>	without difficulty; uncomplicated; direct; easy to do or understand
<b>structure</b>	<i>verb</i> give a pattern, organisation or arrangement to; construct or arrange according to a plan; <i>noun</i> in languages, arrangement of words into larger units, e.g. phrases, clauses, sentences, paragraphs and whole texts, in line with cultural, intercultural and textual conventions
<b>structured</b>	organised or arranged to produce a desired result
<b>study sketch</b>	2D visual design representations used for investigating the appearance and visual impact of ideas, such as aspects of geometric proportion, configuration, scale, layout and mechanism
<b>subject</b>	a branch or area of knowledge or learning defined by a syllabus; school subjects are usually based in a discipline or field of study (see also 'course')
<b>subject matter</b>	the subject-specific body of information, mental procedures and psychomotor procedures that are necessary for students' learning and engagement within that subject

Term	Explanation
<b>substantial</b>	of ample or considerable amount, quantity, size, etc.; of real worth or value; firmly or solidly established; of real significance; reliable; important; worthwhile
<b>substantiated</b>	established by proof or competent evidence
<b>subtle</b>	fine or delicate in meaning or intent; making use of indirect methods; not straightforward or obvious
<b>successful</b>	achieving or having achieved success; accomplishing a desired aim or result
<b>succinct</b>	expressed in few words; concise; terse; characterised by conciseness or brevity; brief and clear
<b>sufficient</b>	enough or adequate for the purpose
<b>suitable</b>	appropriate; fitting; conforming or agreeing in nature, condition or action
<b>summarise</b>	give a brief statement of a general theme or major point/s; present ideas and information in fewer words and in sequence
<b>summative assessment</b>	assessment whose major purpose is to indicate student achievement; summative assessments contribute towards a student's subject result
<b>superficial</b>	concerned with or comprehending only what is on the surface or obvious; shallow; not profound, thorough, deep or complete; existing or occurring at or on the surface; cursory; lacking depth of character or understanding; apparent and sometimes trivial
<b>supported</b>	corroborated; given greater credibility by providing evidence
<b>sustainable</b>	designs that can be supported indefinitely in terms of their economic, social and ecological impact on the wellbeing of humans
<b>sustained</b>	carried on continuously, without interruption, or without any diminishing of intensity or extent
<b>syllabus</b>	a document that prescribes the curriculum for a course of study
<b>syllabus objectives</b>	outline of what the school is required to teach and what students have the opportunity to learn; described in terms of actions that operate on the subject matter; the overarching objectives for a course of study (see also 'unit objectives', 'assessment objectives')
<b>symbolise</b>	represent or identify by a symbol or symbols
<b>synthesise</b>	combine different parts or elements (e.g. information, ideas, components) into a whole, in order to create new understanding
<b>systematic</b>	done or acting according to a fixed plan or system; methodical; organised and logical; having, showing or involving a system, method or plan; characterised by system or method; methodical; arranged in or comprising an ordered system

Term	Explanation
<b>systems</b>	<p>a group of interacting objects, materials or processes that form an integrated whole; systems can be open or closed; a system has properties and/or functions that can be described differently from its component parts; systems can be identified as four types:</p> <ul style="list-style-type: none"> <li>• natural systems, e.g. an ecosystem including plants and animals</li> <li>• designed physical systems, e.g. buildings, road networks, aircraft, airports</li> <li>• designed abstract systems, e.g. mathematic equations, computer algorithms</li> <li>• human activity systems, e.g. a team task, flight crew, human-machine interface</li> </ul>
<b>T</b>	
<b>tame problem</b>	well understood and defined, and can be addressed in isolation
<b>tangible</b>	capable of being touched; discernible by the touch; material or substantial
<b>technical</b>	a feature of a design problem concerning use, function, sustainability, physical dimensions, ergonomics
<b>techniques</b>	procedures or skills used in a task
<b>technologies</b>	materials, data, systems, components, tools and equipment
<b>template</b>	flexible rulers and French curves used to assist the drawing of curves, circles, shapes, figures
<b>test</b>	take measures to check the quality, performance or reliability of something
<b>test rigs</b>	partial representation of a design that affords testing of limited function
<b>thorough</b>	carried out through, or applied to, the whole of something; carried out completely and carefully; including all that is required; complete attention to every detail; not superficial or partial; performed or written with care and completeness; taking pains to do something carefully and completely
<b>thoughtful</b>	occupied with or given to thought; contemplative; meditative; reflective; characterised by or manifesting thought
<b>three-dimensional object</b>	used to visualise design ideas in a form that has depth; it includes models created from the manual cutting, joining and forming of materials or the output of a 3D printer
<b>time-based media</b>	used to visually design ideas that use time as a dimension; measured in duration, e.g. film, video, animation, computer-based technologies
<b>toile</b>	an early version of a garment made in cheap material so that the design can be tested
<b>topic</b>	a division or sub-section within a unit; all topics/sub-topics within a unit are interrelated



Term	Explanation
<b>trademark</b>	an intellectual property right granted for a letter, number, word, phrase, sound, smell, shape, logo, picture, aspect of packaging or any combination of these, which is used to distinguish goods and services of one trader from those of another
<b>two-dimensional media</b>	used to visualise design ideas as sketches and drawings that exist on a flat surface; it includes two-dimensional and three-dimensional images
<b>U</b>	
<b>unclear</b>	not clear or distinct; not easy to understand; obscure
<b>understand</b>	perceive what is meant by something; grasp; be familiar with (e.g. an idea); construct meaning from messages, including oral, written and graphic communication
<b>uneven</b>	unequal; not properly corresponding or agreeing; irregular; varying; not uniform; not equally balanced
<b>unfamiliar</b>	not previously encountered; situations or materials that have not been the focus of prior learning experiences or activities
<b>unique</b>	unusual or special in some way; different in some way; related to the originality of creative ideas (Torrance, 1998)
<b>unit</b>	a defined amount of subject matter delivered in a specific context or with a particular focus; it includes unit objectives particular to the unit, subject matter and assessment direction
<b>unit objectives</b>	drawn from the syllabus objectives and contextualised for the subject matter and requirements of a particular unit; they are assessed at least once in the unit (see also 'syllabus objectives', 'assessment objectives')
<b>unrelated</b>	having no relationship; unconnected
<b>use</b>	operate or put into effect; apply knowledge or rules to put theory into practice
<b>useful</b>	how well the design fulfils its intended purpose
<b>V</b>	
<b>vague</b>	not definite in statement or meaning; not explicit or precise; not definitely fixed, determined or known; of uncertain, indefinite or unclear character or meaning; not clear in thought or understanding; couched in general or indefinite terms; not definitely or precisely expressed; deficient in details or particulars; thinking or communicating in an unfocused or imprecise way
<b>valid</b>	sound, just or well-founded; authoritative; having a sound basis in logic or fact (of an argument or point); reasonable or cogent; able to be supported; legitimate and defensible; applicable

Term	Explanation
<b>variable</b>	<i>adjective</i> apt or liable to vary or change; changeable; inconsistent; (readily) susceptible or capable of variation; fluctuating; uncertain; <i>noun</i> in mathematics, a symbol, or the quantity it signifies, that may represent any one of a given set of numbers and other objects
<b>variety</b>	a number or range of things of different kinds, or the same general class, that are distinct in character or quality; (of sources) a number of different modes or references
<b>virtual reality</b>	digital models that are viewed or interacted with stereoscopically
<b>visual communication</b>	includes photographs, sketches, drawings, diagrams and models
<b>visualisation</b>	the representation of information and imagined ideas as drawings and low-fidelity prototypes; used by designers to progress ideas held in memory
<b>W</b>	
<b>walk-throughs</b>	used in interior design, architecture and landscape architecture to simulate the experience of moving through designed environment
<b>website architecture diagram</b>	a diagram communicating the relationships between website content
<b>wellbeing</b>	good or satisfactory condition of existence
<b>wicked problem</b>	cannot be understood or defined completely and can have hard-to-predict impacts on other systems or problems
<b>wide</b>	of great range or scope; embracing a great number or variety of subjects, cases, etc.; of full extent
<b>with expression</b>	in words, art, music or movement, conveying or indicating feeling, spirit, character, etc.; a way of expressing or representing something; vivid, effective or persuasive communication
<b>written communication</b>	includes language conventions, design-specific vocabulary and language features such as notes, paragraphs and sentences

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## 8 Version history

Version	Date of change	Update
1.1	June 2018	Editorial edits
		Subject matter amendments
		IA1: Examination — design challenge <ul style="list-style-type: none"> <li>• amendments to specifications</li> </ul>
		IA3: Project — folio <ul style="list-style-type: none"> <li>• amendments to specifications and assessment objectives</li> </ul>
		EA: Examination <ul style="list-style-type: none"> <li>• amendments to specifications and assessment objectives</li> </ul>
		Reporting standards <ul style="list-style-type: none"> <li>• amendments to reflect modifications to ISMGs</li> </ul>
		Amendment to ISMGs — IA1, IA2 and IA3
		Glossary updated
1.2	June 2021	External assessment conditions <ul style="list-style-type: none"> <li>• Equipment required — removal of A-3 tracing paper</li> </ul>

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