

**PBL/Design Project unit:**

Teacher/s:

Class/es: Starting date: Duration:  
Lesson length: Lesson frequency:


**Unit description**

**Key Inquiry Question/s**

**Problem Statement**

**Driving Question**

**GENERAL CAPABILITIES**

CCT   ICT   Personal & Social   Ethical Understanding   Intercultural Understanding   Literacy   Numeracy

**LEARNING AREAS**

English  Mathematics  Science  Technologies  HASS  The Arts  Health & PE  Languages

**CROSS CURRICULUM PRIORITIES**

Aboriginal and Torres Strait Islander histories and cultures   Asia and Australia's engagement with Asia   Sustainability 

**DESIGN THINKER'S 'MODUS OPERANDI'**

**1. Fact-finding**

- Explore and investigate technologies and materials
- Collect and interpret data
- Identify design needs and opportunities

**2. Generating Ideas**

- Imagine, communicate and record design ideas

**3. Judging Ideas**

- Analyse and evaluate design ideas

**4. Planning**








- Design courses of action
- Document project plans
- Monitor projects








**5. Producing**







- Test and implement designed solutions







**6. Reflecting**








- Reflect on design processes
- Evaluate designed solutions
- Reflect on learning










Project Phase (What the students will do)	Capabilities Learning Goals (eg CCT, P&SC, ICT)	Learning Areas Learning Goals (eg Design Thinking)	Thinking & Learning Activities	Resources	Main Teaching Points
<p><b>A</b>spiration + <b>I</b>nspiration = <b>M</b>otivation</p> <p><i>Aspirational!</i></p> <p>Students will identify any <b>aspirations</b> (interests, passions, personal goals) that they might have that can be factored into the project.</p> <p><b>ENTRY EVENT</b></p> <p><i>Inspirational!</i></p> <p>Students will have an experience that will <b>draw their attention</b> to the topic, issue or problem - one that will <b>engage them emotionally</b> and <b>inspire</b> them to want to explore the topic more or pursue a solution to a problem?</p> <p>Students will view a 'design hero' at work solving a problem that affects people or the environment.</p>	<p> <i>Describes and reflects on personal strengths.</i></p> <p> <i>Identifies their abilities, talents and interests as learners.</i></p> <p> <i>Poses exploratory questions based on personal interests and experiences.</i></p> <p> <i>Describes the influence that people, situations and events have on their emotions.</i></p>	<p> <i>Explains a range of needs, opportunities or problems and define them in terms of functional requirements and constraints.</i></p> <p> <i>Explains how people working in design and technologies occupations consider factors that impact on design decisions.</i></p> <p> <i>Explains the contribution of design and technology innovations and enterprise to society.</i></p>	<p>Complete MIPAC worksheet, relating your answers to the theme / topic / problem / content.</p> <p>Create your own version of a 'Wonder Wheel', relating your questions to the theme / topic / problem / content.</p> <p><b>Whole class discussion</b></p> <p>What feelings and thoughts are you having after experiencing this Entry Event?</p> <p>How are/were people, places or things harmed or disadvantaged by the original problem?</p> <p>What do you think were some of the causes of the problem?</p> <p>How do you think the designer went about solving the problem? Why do you think she/he made the choices they made?</p> <p>What are some of the ways that the designer / problem solver has made the world a better place for the present and into the future?</p>	<p>'MIPAC' BLM from the <i>Minds Wide Open Blackline Masters Book</i></p> <p>Example: 'Wonder Wheel' BLM from the <i>Minds Wide Open Blackline Masters Book</i></p> <p>Video, book, guest speaker, guest demonstrator, incursion, excursion ...</p>	





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<p><b>FACT FINDING</b> <i>Investigate.</i> <i>Get all the facts</i></p> <p>The students will identify the problem to be solved and/or define the purpose of their product, service or environment.</p> <p>The students will gather viewpoints and perspectives of others (eg those affected by the problem, or the end-users of their future product).</p> <p>The students will research the topic to fill in gaps in their knowledge.</p> <p>The students will identify any new skills they will need to learn in order to complete the project.</p>	<p> <i>Poses exploratory questions based on personal interests and experiences.</i></p> <p> <i>Discusses the value of diverse perspectives and describes a point of view that is different from their own.</i></p> <p> <i>Manages and maintains digital data using common methods.</i></p> <p> <i>Contributes to groups and teams, suggesting improvements in methods used for group investigations.</i></p> <p> <i>Describes personal strengths and challenges and identifies skills they wish to develop.</i></p>	<p> <i>Defines and decomposes complex problems in terms of functional and non-functional requirements.</i></p> <p> <i>Collects, authenticates and interprets data from a range of sources to assist in making informed judgements</i></p>	<p><b>View:</b> The Coloured Thinking Caps tutorial by Sofia – Black &amp; White Thinking Cap</p> <p><b>Whole class discussion</b> (teacher-directed): Answer questions from the Black &amp; White Thinking Cap poster.</p> <p><b>Warm-up activity.</b> CCT Crunches – <i>FOO Fight</i> or <i>Posing the Question</i> or <i>What’s the Problem?</i></p> <p><b>Small group discussion</b> (student-directed): Answer the Black &amp; White Thinking Cap questions in your <i>Thinking Journal</i>. (Students refer to the <i>Black &amp; White Thinking Cap</i> page in their thinking journal. Answering the questions in the journal will help ‘steer’ them through this phase of the design thinking / problem solving process.)</p> <p>Draft, edit and finalise the ‘Problem Statement’ and ‘Driving Question’. Consider if your solution will likely be a PRODUCT, SERVICE or ENVIRONMENT</p>	<p><i>Minds Wide Open Teacher’s Toolbox</i></p> <p><a href="http://cct.education/">http://cct.education/</a></p> <p><a href="http://cct.education/cct-crunches-5-6/">http://cct.education/cct-crunches-5-6/</a></p> <p>Thinking Journal B&amp;W BLM page from <i>Minds Wide Open Blackline Masters Book</i></p> <p>BLM pages from <i>Minds Wide Open Blackline Masters Book</i></p>	

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<p><b>IDEATION</b> <i>Generate ideas</i></p> <p>The students will generate a minimum of seven ideas for their potential product/solution.</p> <p>The students won't judge their ideas until the next session.</p>	<p> <i>Explores situations using creative thinking strategies to propose a range of alternatives.</i></p> <p> <i>Expands on known ideas to create new and imaginative combinations.</i></p> <p> <i>Uses class discussions as learning tools to explore ideas.</i></p>	<p> <i>Creates designed solutions based on a critical evaluation of needs or opportunities.</i></p> <p> <i>Creates and connects design ideas of increasing complexity and justifies their decisions.</i></p> <p> <i>Generates original ideas in two-dimensional representations using a range of technical drawings.</i></p>	<p><b>View:</b> The Coloured Thinking Caps tutorial by Sofia – Rainbow Cap</p> <p><b>Warm-up activity.</b> CCT Crunches - <i>Alternative Uses</i> or <i>Sketch Your Imagination</i> or <i>Raising the Bar</i>.</p> <p><b>Whole class discussion</b> (teacher-directed): Consider questions from the Rainbow Thinking Cap poster.</p> <p><b>Small group discussion</b> (student-directed): Answer the Rainbow Cap questions in your <i>Thinking Journal</i>. (Students refer to the <i>Rainbow Thinking Cap</i> page in their thinking journal. Answering the questions in the journal will help 'steer' them through this phase of the design thinking / problem solving process.)</p>	<p>Minds Wide Open Teacher's Toolbox</p> <p><a href="http://cct.education/">http://cct.education/</a></p> <p><a href="http://cct.education/cct-crunches-5-6/">http://cct.education/cct-crunches-5-6/</a></p> <p>Thinking Journal Rainbow Thinking BLM page from <i>Minds Wide Open Blackline Masters Book</i></p>	

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<p><b>JUDGING IDEAS</b> <i>Select your best idea</i></p> <p>The students will select their best idea, reject their worst ideas, and give reasons to justify their choices.</p>	<p> <i>Contributes to and predicts the consequences of group decisions in a range of situations.</i></p> <p> <i>Predicts possible outcomes when putting ideas into action.</i></p>	<p> <i>Evaluates their ideas using detailed criteria for success, including sustainability considerations.</i></p> <p> <i>Creates and connects design ideas of increasing complexity and justifies their decisions.</i></p> <p> <i>Explains how the features of technologies impact on designed solutions and influence design decisions.</i></p> <p> <i>Evaluates their solutions in terms of risk, sustainability and potential for innovation and enterprise..</i></p>	<p><b>View:</b> The Coloured Thinking Caps tutorial by Sofia – Red &amp; Green Cap</p> <p><b>Whole class discussion</b> (teacher-directed): Answer questions from the Red &amp; Green Thinking Cap poster.</p> <p><b>Warm-up activity.</b> CCT Crunches – <i>The Ads vs The Bads</i> or <i>Scissors Paper Think</i></p> <p><b>Small group discussion</b> (student-directed): Answer the Red &amp; Green Thinking Cap questions in your <i>Thinking Journal</i>. (Students refer to the <i>Green &amp; Red Thinking Cap</i> page in their thinking journal. Answering the questions in the journal will help ‘steer’ them through this phase of the design thinking / problem solving process.)</p>	<p>Minds Wide Open Teacher’s Toolbox</p> <p><a href="http://cct.education/">http://cct.education/</a></p> <p><a href="http://cct.education/cct-crunches-5-6/">http://cct.education/cct-crunches-5-6/</a></p> <p>Thinking Journal Green &amp; Red BLM page from <i>Minds Wide Open Blackline Masters Book</i></p>	

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<p><b>PLANNING</b> <i>Design a course of action</i></p> <p>The students will describe the process they will follow to produce their product or implement their solution.</p> <p>The students will compose a detailed procedural text or create an Action Plan.</p>	<p> <i>Devises strategies and formulates plans to assist in the completion of challenging tasks.</i></p> <p> <i>Outlines the details and sequence in a whole task and separates it into workable parts.</i></p> <p> <i>Identifies the value and role of ICT use at home and school.</i></p>	<p> <i>Plans processes and resources to produce designed solutions for each of the prescribed technologies contexts.</i></p> <p> <i>Identifies the steps involved in planning the production of designed solutions.</i></p> <p> <i>Develops detailed project management plans incorporating elements such as sequenced time, cost and action plans to manage a range of design tasks safely.</i></p> <p> <i>Applies project management skills to document and use project plans to manage production processes.</i></p>	<p><b>View:</b> The Coloured Thinking Caps tutorial by Sofia – Pink Cap</p> <p><b>Whole class discussion</b> (teacher-directed): Answer questions from the Pink Thinking Cap poster.</p> <p><b>Warm-up activity.</b> CCT Crunches - <i>Mother of Invention</i> or <i>Posing the Question</i>.</p> <p><b>Small group discussions and activities</b> (student-directed): Answer the Pink Cap questions in your <i>Design Thinking Journal</i>. (Students refer to the <i>Pink Thinking Cap</i> page in their thinking journal. Answering the questions in the journal will help ‘steer’ them through this phase of the design thinking / problem solving process.)</p>	<p>Minds Wide Open Teacher’s Toolbox</p> <p><a href="http://cct.education/">http://cct.education/</a></p> <p><a href="http://cct.education/cct-crunches-5-6/">http://cct.education/cct-crunches-5-6/</a></p> <p>Thinking Journal Pink Cap BLM page from <i>Minds Wide Open Blackline Masters Book</i></p>	

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<p><b>PRODUCING</b> <i>Put your idea into action</i></p> <p>The students will create a prototype or compose a draft.</p> <p>The students will test their prototype and make improvements.</p> <p>The students will plan how they will promote, pitch or present their product/ solution.</p> <p><b>EXIT EVENT</b> The students will exhibit, launch or pitch their product / solution.</p>	<p> <i>Contributes to groups and teams, suggesting improvements in methods used for group projects.</i></p> <p> <i>Experiments with a range of options when putting ideas into action.</i></p> <p> <i>Persists with tasks when faced with challenges and adapts their approach where first attempts are not successful.</i></p> <p> <i>Delivers presentations incorporating appropriate visual and multimodal elements.</i></p>	<p> <i>Applies management plans, changing direction when necessary, to successfully complete design tasks.</i></p> <p> <i>Independently and safely tests and modifies a range of solutions that meet intended purposes.</i></p> <p> <i>Identifies the changes necessary to designed solutions to realise preferred futures they have described.</i></p> <p> <i>Independently and safely produces effective designed solutions for the intended purpose.</i></p> <p> <i>Produces rendered, illustrated views for marketing.</i></p>	<p><b>View:</b> The Coloured Thinking Caps tutorial by Sofia – Purple Cap</p> <p><b>Whole class discussion</b> (teacher-directed): Answer questions from the Purple Thinking Cap poster.</p> <p><b>Warm-up activity.</b> CCT Crunches - <i>Mother of Invention</i> or <i>Raising the BAR</i></p> <p><b>Small group discussions and activities</b> (student-directed): Answer the Purple Cap questions in your <i>Thinking Journal</i>. (Students refer to the <i>Purple Thinking Cap</i> page in their thinking journal. Answering the questions in the journal will help 'steer' them through this phase of the design thinking / problem solving process.)</p> <p>Students test prototype/draft using the 'Product Testing: Gathering Perspectives' BLM.</p>	<p>Minds Wide Open Teacher's Toolbox</p> <p><a href="http://cct.education/">http://cct.education/</a></p> <p><a href="http://cct.education/cct-crunches-5-6/">http://cct.education/cct-crunches-5-6/</a></p> <p>Thinking Journal Purple Cap BLM page from <i>Minds Wide Open Blackline Masters Book</i></p> <p>BLM page from <i>Minds Wide Open Blackline Masters Book</i></p>	

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<p><b>REFLECTING</b> <i>Think about what you've learned and achieved</i></p> <p>The students will evaluate their product/solution.</p> <p>The students will reflect on the processes they used by identifying successes and failures.</p> <p>The students will seek out, and think about, feedback from others (including reflecting on their teacher's feedback and assessment).</p> <p>The students will articulate what they have learned from participating in this project.</p>	<p> <i>Evaluates whether they have accomplished what they set out to achieve.</i></p> <p> <i>Seeks and responds to feedback from teachers to assist them in consolidating strengths, addressing weaknesses and fulfilling their potential.</i></p> <p> <i>Reflects on personal strengths and achievements, based on self-assessment strategies and teacher feedback.</i></p>	<p> <i>Evaluates their design processes and solutions using detailed criteria for success, including sustainability considerations.</i></p>	<p><b>View:</b> The Coloured Thinking Caps tutorial by Sofia – Orange Cap</p> <p><b>Warm-up activity.</b> CCT Crunches - <i>That's Good That's Bad</i> or <i>Quote Unquote</i> or <i>The Ads vs The Bads</i></p> <p><b>Whole class discussion</b> (teacher-directed): Answer questions from the Orange Thinking Cap poster</p> <p><b>Small group discussion</b> (student-directed): Answer the questions from the Orange Cap page in your <i>Thinking Journal</i>. (Students refer to the <i>Orange Thinking Cap</i> page in their thinking journal. Answering the questions in the journal will help 'steer' them through this phase of the design thinking / problem solving process.)</p>	<p>Minds Wide Open Teacher's Toolbox</p> <p><a href="http://cct.education/cct-crunches-5-6/">http://cct.education/cct-crunches-5-6/</a></p> <p><a href="http://cct.education/">http://cct.education/</a></p> <p>Thinking Journal Orange Cap BLM page from <i>Minds Wide Open Blackline Masters Book</i></p>	



## EVALUATION OF UNIT

To what extent did the students take 'ownership' of their work/project? (Who did the majority of the decision making: students/parents or the teacher?)

To what extent were learning goals observable/observed in the learning activities, design processes and students' solutions?

Identify which learning activities require modification to be more effective in the future.

Recommendations for future teaching/learning?