

# 10ITD: Creating Design Solutions - BRIDGES

**Achievement Standard:** By the end of Year 10 students will have had the opportunity to design and produce at least four designed solutions focused on one or more of the five technologies contexts content descriptions. Students use design and technologies knowledge and understanding, processes and production skills and design thinking to produce designed solutions to identified needs or opportunities of relevance to individuals and regional and global communities. Students work independently and collaboratively. Problem-solving activities acknowledge the complexities of contemporary life and make connections to related specialised occupations and further study.

Using a range of technologies including a variety of graphical representation techniques to communicate, students generate and represent original ideas and production plans in two and three-dimensional representations using a range of technical drawings including perspective, scale, orthogonal and production drawings with sectional and exploded views. They produce rendered, illustrated views for marketing and use graphic visualisation software to produce dynamic views of virtual products.

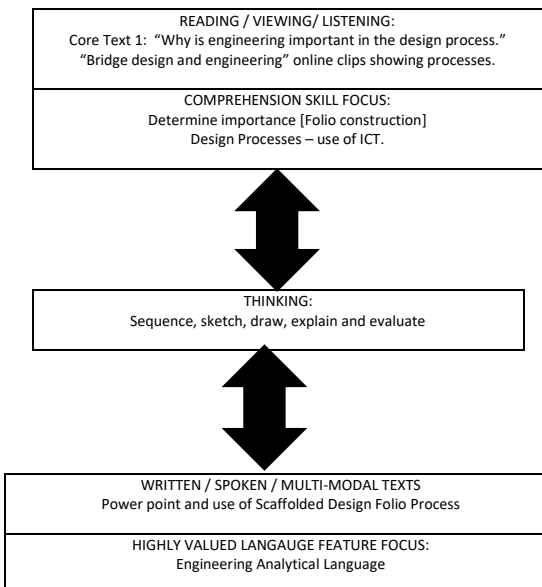
Students identify the steps involved in planning the production of designed solutions. They develop detailed project management plans incorporating elements such as sequenced time, cost and action plans to manage a range of design tasks safely. They apply management plans, changing direction when necessary, to successfully complete design tasks. Students identify and establish safety procedures that minimise risk and manage projects with safety and efficiency in mind, maintaining safety standards and management procedures to ensure success. They learn to transfer theoretical knowledge to practical activities across a range of projects.

**Assessment:**  
**Student Workbook**  
**Practical Project:**  
**Bridge Design**  
**10 weeks**  
**Term 1 Week 10**



## Engineering principles and systems

Engineering principles and systems is focused on how forces can be used to create light, sound, heat, movement, control or support in systems. Knowledge of these principles and systems enables the design and production of sustainable, engineered solutions. Students need to understand how sustainable engineered products, services and environments can be designed and produced as resources diminish. Students will progressively develop knowledge and understanding of how forces and the properties of materials affect the behaviour and performance of designed engineering solutions.



WORKSHOP PRACTICES
<p>This project involves gaining knowledge, attitude, and skills, required to select, measure and cut materials according to job specifications, within the quality tolerances and requirements, realistic job completion timeframes, safety and personal conduct requirements of a workshop based production. Key take home skills;</p> <ul style="list-style-type: none"> <li>Have a clear understanding of forces in bridges.</li> <li>Demonstrate knowledge and understanding of designing methods.(Folio)</li> <li>Have a clear understanding of WH&amp;S requirements</li> <li>Demonstrate knowledge of WH&amp;S by using correct PPE and practical demonstration in the workshop</li> <li>Demonstrate basic practical skills such as the use of relevant tools</li> <li>Perform a sequence of routine tasks given clear directions</li> <li>Select only two tools out and in use at one time</li> <li>Work at allocated vice /space with a safe attitude</li> <li>Correct way and attitude to stand in a teacher demonstration (semi-circle single file)</li> <li>Produce a series of sketches and final drawing as part of a design folio</li> <li>Accurately measure and cut materials according to product requirements</li> <li>Entry and exit procedures into the workshop</li> <li>Bags must be locked in the bag box locked for lesson</li> <li>All students must have a pencil and pen for ITD lessons</li> <li>Margin and date in books</li> <li>Housekeeping clean up procedures</li> <li>Timeline for project completion</li> </ul>

Standard Elaborations - Proficiency Scale			
	Technologies Contexts	Generating and Designing	Collaborating and managing
4	Informed evaluation of the features of technologies and their appropriateness for purpose for one or more of the technologies contexts when producing designed solutions for identified needs or opportunities	Effective creation and connection of design ideas and processes of increasing complexity and informed justification of decisions. Effective communication and documentation of projects for a range of audiences.	Application of sequenced production and management plans when producing designed solutions: making informed adjustments to plans when necessary working independently and collaboratively
3	<p><i>Recognise or recall technical vocabulary:</i></p> <ul style="list-style-type: none"> <li>Personal protective Equipment, PPE</li> <li>Forces</li> <li>Evaluation</li> <li>Plywood &amp; materials</li> <li>Ratio</li> <li>Safety Induction</li> <li>Routine</li> <li>Techniques</li> <li>Guided investigating</li> <li>Prototype and product</li> <li>Use of technologies</li> <li>graphical representation</li> </ul> <p><i>Recognise or recall technical information:</i></p> <ul style="list-style-type: none"> <li>safe working practices for specific classroom design projects</li> <li>properties of plywood</li> <li>engineering design</li> <li>producing design solutions</li> </ul>	<p><i>Perform basic process such as:</i></p> <ul style="list-style-type: none"> <li>Investigating</li> <li>Evaluating</li> <li>Producing</li> <li>Creation</li> <li>Connection of ideas</li> <li>Marking out</li> <li>Cutting out</li> <li>Sequenced production</li> <li>Management plans</li> <li>Adjustments</li> <li>Collaborative work</li> <li>documentation</li> <li>following WH&amp;S and workshop requirements</li> </ul>	<p><i>Recognise or recall vocabulary:</i></p> <p>Explain, evaluate, evaluative language, designed solutions, processes, judge, criteria, functionality, aesthetics, design, collaborate, communicate, justify and technologies.</p> <p><i>Perform basic process such as:</i></p> <ul style="list-style-type: none"> <li>identify features of plywood which match design criteria</li> <li>explain the degree of success of the final product in terms of the criteria and collaborative working</li> <li>explain adjustments to your process and final product</li> <li>communicate ideas in complete sentences and/or appropriate graphical representations</li> </ul>