spacewise
better public places and spaces

resource book
Acknowledgements

The Technology Unit of the Curriculum K–12 Directorate has developed professional learning workshops for secondary technology teachers in NSW public schools to provide practical teaching and learning strategies, and resources to enhance built environment education in Technology 7–8. Development of these resources was funded and supported by the NSW Architects Registration Board.

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### Spacewise: teaching and learning program

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Spacewise implementation: Strathfield South High School

Teacher: Kim Ihnatko
Year 8 Technology (Mandatory)
Week 6 Term 3 – Week 9 Term 4 (13 weeks)

- Students participating in the Spacewise pilot had 6 x 50 minute classes per fortnight. Week 1 in the cycle consisted of two double periods and a single. Week 2 consisted of a single period.
- Overall consistency was difficult to maintain during the 13 week program due to a high level of student absenteeism for a variety of reasons.
- Students did not like working in groups and very early in the program we abandoned the idea of team booklets.
- I adopted the strategy of introducing the students to Built Environment concepts through short lessons and discussions followed by an activity or worksheet. Some of the examples were used from the Spacewise program such as What is Space? What is public/private? Other activities and discussions included:
  - the role of architects
  - scale and basic drawing
  - ergonomics
  - drawing a memory map of their trip from home to school and locating an element of their trip on Google Earth
  - indigenous housing
  - building for climatic zones
  - Australian architecture styles
  - research on building materials and street furniture
  - designing a simple house using a CAD program (Home Design Studio) which all students enjoyed. Students were able to create plans and perspectives instantly which kept them engaged for a number of lessons. Good for learning to design in plan, learning about ergonomics and scale and most students could relate the program to computer games they had played
  - model making skills
  - heritage and conservation. I contacted Strathfield Council and collected information on our area. A heritage officer did research on our behalf of the streets included in our walk, including when the homes were built and significant landmarks which are no longer there.
• In Week 3 of the pilot students were lead on a neighbourhood walk close to the school. The walk was conducted during a double period leading into recess. Equipment taken on the walk included clip boards, worksheets, cameras and tape measures. An area was selected to record and assess and students were assigned or volunteered to take photographs, sketch details and elevations of existing buildings, draw plans and pace out areas.

• The information was brought back to class where students created detail boards of photos, photographic elevations, traced elevations, scaled plans and developed ideas for improvements to the area.

• Students were encouraged to select an activity they were interested in and these included designing a fountain for the Chain of Ponds park, a playground, a graffiti wall for the park, shelter and seating, an outdoor cafe in the abandoned shop, designing a new sign for the park, redeveloping the parking, a half basketball court, a multicultural sculpture, landscaping and creating a scaled model of the area. This was the most successful stage, with the majority of students engaged with their individual projects, some wanting to come at recess and lunch to work on their section.

• The creation of the A3 folder recording the class work became very important to the students and was often referred to during class. Through the folder students took ownership of the project and could see the development of their work. At the end of term I had students from other Year 8 classes volunteering to help on the project. The first week of Term 1 2010 two students, who are now in Year 9, wanted to come to finish the model during their other classes. The model was incomplete at the end of Week 13 but we do plan on finishing it and displaying it in the Graphics room.

• Unforseen happenings in regard to the project were the actual renovation of the Butcher Shop, road works which altered the original plan, new landscaping by council and a homeless man coming to live in the park. All these were reported by students as they walked or drove past the area on their way to or from school and were then discussed. One student began a shelter for the homeless man incorporating a sink and cupboard.
## Glossary for project work: Technology K–12

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tr>
<td>unit of work (including a project)</td>
<td>The teaching program developed by the teacher that shows how syllabus requirements will be met and the sequence of teaching and learning activities. In the unit of work the project typically forms the main focus of learning for students.</td>
</tr>
<tr>
<td>project</td>
<td>The set of activities the student undertakes in order to address specified syllabus outcomes/content and involving the student designing and producing a solution to the project task and documenting the process.</td>
</tr>
<tr>
<td>project task</td>
<td>The framework provided to the class by the teacher defining the scope for the student’s project. It includes what the students need to learn/explore, what the limitations are and the opportunity or need for a designed solution. It is framed by the teacher to provide the opportunity for students to demonstrate achievement of specified syllabus outcomes/content.</td>
</tr>
<tr>
<td>project brief</td>
<td>A concise statement prepared by students clarifying the project task and defining the need or opportunity to be resolved, the users, the criteria for success, the possible consequences and impacts, the constraints and available resources and the timeframe for the project.</td>
</tr>
<tr>
<td>authentic project work</td>
<td>A project that has a benefit, purpose and use; a user who can provide feedback on the success of the solution; limitations to work within; a real context influenced by social, ethical and environmental issues.</td>
</tr>
<tr>
<td>technology process</td>
<td>A process applied by students to design and produce a solution to an authentic need or opportunity involving the phases of exploring and defining the task, generating and developing ideas and producing solutions, with planning, managing and evaluating occurring throughout the process.</td>
</tr>
<tr>
<td>student direction in project work</td>
<td>The opportunity provided to students to negotiate with the teacher and manage aspects of project work such as the need or opportunity or user for the solution, timing, budget, use of specific materials, facilities and equipment, access to community support or expertise.</td>
</tr>
<tr>
<td>open-ended project task</td>
<td>A project task that does not prescribe a solution and encourages various responses; student direction can apply to the whole project (as in HSC project work) or to aspects or phases of the project.</td>
</tr>
<tr>
<td>criteria for success</td>
<td>A negotiated list of what the solution must do to be acceptable to the users and client. The criteria guide development decisions and provide a framework for evaluation at all stages of the process and a measure against which to judge the success of the solution. Criteria need to be specific and measurable, and described using language understood by both the designer and the client.</td>
</tr>
<tr>
<td>consequences and impacts</td>
<td>The effect of a process or solution on people or the environment. The benefits and costs to different stakeholders need to be considered in the short and long term.</td>
</tr>
<tr>
<td>limitations and constraints</td>
<td>Non-negotiable parameters that the designer must work within.</td>
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Quality project tasks


The most significant decision a technology teacher makes in a project is what task and why. If the answer is “because it is in the program” or that “it’s the task we always do” then an important opportunity may have been lost.

Technology syllabuses provide teachers with a lot of flexibility in their choice of project tasks. Building on the findings of middle years research we should use this flexibility to select tasks which will most engage our students and recognise student interests and backgrounds.

The following points outlined below are considerations for the teacher in choosing a quality project task.

For teachers a quality project task will:

- allow the teaching of programmed syllabus outcomes and content
- provide a vehicle for engaging students and demonstrating quality teaching practices
- be sufficiently open-ended to allow curriculum differentiation to meet the needs of different learners in the class
- provide an opportunity to collect evidence of significant student learning, for assessment and reporting purposes
- be manageable and sufficiently focused to allow student depth of understanding and success.

For students a quality project task will be a rich context for technology learning that:

- is ‘real’ or authentic, providing clear benefits to someone in their community
- is engaging because it builds on areas of interest or relevance in students’ lives
- enables deep understandings and skill development because it builds on existing student knowledge or allows substantial time to develop background knowledge
- allows the student to gain feedback from the user that informs the development of the student’s design ideas
- requires students to use an authentic process of design and production that is relevant and is used beyond the classroom.
Developing a quality project task

The following steps can assist in choosing a quality task that meets the teacher’s and students’ needs.

**Step 1: Know what you are required to teach**
- Know what you are required to address from the syllabus at this point in the course. What specific content and outcomes do students need to learn?
- Identify what you will need students to show you as evidence of significant learning.

**Step 2: Know the limitations for the project**
- Identify the design project limitations.
  - What is the total time you have available?
  - Do you have a budget?
  - Are materials and other resources available?
  - What equipment and facilities do you have available?

**Step 3: Look for an authentic need**
- An authentic need/opportunity is meaningful to the student and has:
  - a real benefit, purpose and use
  - a real user who can provide feedback on design ideas and developments
  - real limitations such as time, money, materials, equipment
  - a real context influenced by specific social, ethical and environmental issues.
- Is there someone in the community who may have a product need? (e.g. local pre-school).
- Is there an opportunity arising in the community to develop a product? (e.g. a local community event).
- Are there an abundance of resources available to be used? (e.g. seasonal food, leftover materials).
- Is there expertise keen to help? (e.g. a parent or a community member who is willing to share their expertise with students such as architect, textile artist, craftsperson).

**Step 4: Negotiate with your students**
- Introduce the project to your students. Make clear to your students the non-negotiable aspects of the project and the negotiable aspects. You will need to make explicit the learning and assessment expectations and may specify aspects such as:
  - time, money, materials, facilities available
  - expertise and community support available
  - need or opportunity
  - the user.
- Negotiate with students those areas with which there is flexibility.
- Have an explicit and agreed decision making process for determining the task/s with the students.

At this point you are ready for your students to get going with the project:
*Exploring and defining the task, Generating and developing ideas, Producing solutions, Planning, managing and evaluating.*
Creating a common language in technology learning K-12

Continuity in technology teaching is required if students are to experience a rich progression of technology learning. This continuity is evident in the curriculum, as described by syllabuses.

Continuity of teaching and learning is promoted by the use of a common language. There are many models and diagrams for describing the processes of design and technology. The Technology Unit, in collaboration with practising teachers, has identified some common terms to describe the technology process of designing and producing.

The terms Exploring and defining the task, Generating and developing ideas, Producing solutions, Planning, managing and evaluating have been incorporated into a diagram that can be used from Kindergarten to Year 12 to model the technology process students work through in designing and producing a solution.

This diagram is provided as a draft model for beginning professional dialogue amongst teachers of technology in NSW primary and secondary public schools.

**Exploring and defining the task** involves the activities students undertake to identify and explore a need or opportunity, taking into consideration the user, the client, the available resources and social, ethical and environmental issues. Students establish the criteria for a successful design solution, set milestones and define the constraints for the project in a statement or brief.

**Generating and developing ideas** involves students exploring options, considering existing solutions, generating alternatives, representing and refining those ideas and deciding upon options. Students identify, explore and select resources such as techniques, materials and equipment that will best achieve the solution, taking into account short-term and long-term impacts of their decisions and actions.
Producing solutions involves students finalising design decisions; completing final design representations such as production drawings or storyboards; sequencing the step-by-step actions for production; managing safety risks; practicing and refining techniques; and completing the production of the solution. Students reflect on the success of the solution, the process and the learning.

Planning, managing and evaluating is an essential component of each of the above phases. Management decisions made by students involve planning and reviewing milestones and implementing and monitoring time, actions and financial plans. Ongoing evaluation, related to the criteria of success, informs the students' decision making at each phase and the evaluation at the conclusion of the project involves reflection and learning about the process used and the success of the solution.


For more information on the technology process refer to the Technology web site http://www.curriculumsupport.education.nsw.gov.au/designproduce/tech_process.htm
Implementing the Technology learning process in the classroom

Questioning techniques are important for teacher planning processes in a project, for guiding student thinking and assisting students to become creative, critical, innovative and enterprising. Use the following questions to implement the technology process in the classroom.

Exploring and defining the task

The need or opportunity

- Is there a product, a system or an environment that is not doing its job effectively?
- Can we think of ways to do it better? (Cheaper, stronger, more attractive etc)
- Is there something we can use in a new way or for a different purpose?
- Is there a need that has no practical solution?

The user

- Who will use the design?
- How will they use the design?
- What will the design have to do to meet the users’ requirements?
- What qualities (aesthetic) will the design need for the user to appreciate it?

The client

- Who has requested the design? Why?
- What will the design have to do to meet the client’s requirements? (functional and aesthetic)

Resources

- What is the budget?
- How much time is available?
- What other resources are available? (Skilled people, information, materials, processes, equipment etc)

Social and environmental considerations

- Who else might the design affect? How?
- Is there an environmental impact?
- Are there laws, rules or regulations that you need to consider?

Criteria for success

- What will the design have to do to be successful?
- What are the most essential success-criteria and which are desirable?
- What is the priority order for the success-criteria?

Defining the task

- How can we bring all these considerations together into a clear and concise statement of the design task or design brief?
Generating and developing ideas

Generating ideas
- What design solutions exist that address similar needs, problems or opportunities?
- What are the advantages and disadvantages of these solutions?
- What creative thinking techniques can we use to generate new ideas?
- What ideas can we come up with?

Representing ideas
- What techniques can we use to represent my ideas (sketching, story-boarding, drawing, modelling, flow-charts, diagrams etc)?
- Who is the audience (me or others) and what is the purpose of the representations (rough ideas, resolving ideas, presenting ideas etc)?
- Which techniques can we use to represent ideas as they become more resolved?
- How can we improve skills in representing ideas?

Exploring resources
- What materials/processes/equipment/etc could be used for the design?
- What are the performance properties the design requires?
- What risks (safety, cost, environmental) are associated with using the materials/processes/equipment/etc?
- How can we test the suitability of the materials/processes/equipment?
- How can I improve my skills in using the materials/processes/equipment/etc proficiently and safely?
- If we are unable to use the materials/processes/equipment/etc, can someone else help?
- Which materials/processes/equipment/etc will we choose and how do they relate to the success criteria?

Resolving ideas
- What are the advantages and disadvantages of each idea in relation to the success criteria?
- Have we considered the long-term (social and environmental impact) as well as the short-term (money, time, appearance) consequences of the design?
- What do the client and user think?
- What design idea/s will we choose and why?
- Will the chosen design meet the success criteria? (essential? desirable?)
- Do we need any further modifications to the design?

Finalising the concept
- Do we know exactly what is involved in producing the design?
- Do we need to further detail the design? (technical construction drawings, pattern pieces, layout, storyboarding, flowcharts, models)
- Which equipment and material is required?
- How much will it cost?
- What is the step-by-step sequence that will need to occur to produce the design?
- Do we have the skills needed to do each step or will we need more time to practice?
- How long is each step likely to take?
- Who is responsible for each step?
• Does our proposed time plan and budget meet the success criteria?
• Will modifications be required?

**Producing solutions**

**Managing safety risks**

• What safety risks can we identify? (user capability and behaviour, materials, equipment, facility, teacher expertise)
• Where can we find sound advice?
• How can we eliminate or control the risks?
• If the risks cannot be controlled how will we modify the design?

**Managing production**

• Have the necessary information, materials and equipment been acquired?
• Is the equipment set up safely and working effectively?
• How and who will manage storage and equipment maintenance issues?
• Do we need particular skills to be modelled (demonstrated) or reviewed with us or are we able to proceed independently?
• Do we need an expert to supervise our work?
• Is the production proceeding according to time plan and budget?
• Is the quality of production work appropriate to the success-criteria?
• What modifications do we need to make to the planned design and production?

**Reflecting on learning after the technology process**

**Design solution**

• What did we produce as a result of the technology process?
• Does it work for the client and user? Do they like it?
• In what ways did our design solution achieve each success-criteria?
• What aspects of the design solution did not achieve the success criteria?
• How would we do it differently next time?

**Design process**

• What was the technology process we used?
• How could the technology project process be improved?
• Was our documentation processes helpful? Why or why not?
• Did we meet the requirements of the design task? Why or why not?
• What skills did I gain or further develop?
• Did the group work well as a team?

**Learning outcomes**

• Which syllabus outcomes were we focusing on?
• How well have I progressed towards achieving each outcome?
• What experiences do I need to improve in my progress?

Source:
Memory map instructions and sample

Visualising public space: memory map

The memory map includes elevation drawings incorporated into a plan. This could be a preliminary drawing sketched from memory and refined as more detail is gathered. This can be realised as a chalk drawing in the playground or on large paper indoors or on A3 paper. Students may need to trial the process on A4 paper and then revise and develop on A3 paper as they feel more confident.

Discuss with students the different styles of buildings that can make up a street or public space. Draw the elements stage by stage.
Investigating and visualising a public space

Learning to look at public space and our streets and most importantly seeing how they were designed and planned, helps us to understand not only how they have developed and changed over time but allows us to think positively about how they might be improved in the future.

There are countless ways students could record what they see on a street investigation including:

**Photography:** using a camera or phone

**Measuring:** using string, pacing out, rulers or tape measures

**Rubbing textures:** using tracing paper, detail paper or plain paper and pencil, chalk or crayon

**Recording street sounds:** using video, phone, microphone

**Drawing:** by transferring information to a:

- **Photographic elevation:** joining photographs together, side by side, overlapping if necessary and then tracing over the photographs with tracing paper and pencil
- **Flat plan/elevation:** drawing a plan of the area with elements drawn in elevation, using paper and pencil or chalk on the ground
- **Detail worksheet:** completing a worksheet with set spaces to draw elevations, windows, doors and special details of a building.
Photographic elevations

- When taking photographs try and overlap each view. This makes it easier to piece it all together on your return.
- Aim to photograph individual buildings and other elements on your walk, all at the same height, a similar distance from viewpoint to element and as front-on as possible.

Instructions

1. Join a number of sheets of card together with masking tape.
2. Using the photographs from the walk, lay photographs side by side, overlapping if necessary.
3. Use spray adhesive or stick glue to fix photographs to card.
4. Aim to have a separate photographic elevation for each side of the street.
5. For an obvious block of buildings, like a group of shops, create a separate elevation.
6. Notes can be added above and below photographs.

Photographs laid out and glued to card
Drawing: Tracing a photographic elevation

- Photographic elevations can be done of the entire street, a group of buildings or a single building.

Instructions

1. Using masking tape on each corner of the photographic elevation, fix sheet to the table.
2. Lay sheets of A3 tracing paper over the photographic elevation and fix with masking tape.
3. Make sure that both the photographic elevation sheet and the tracing paper can be lifted up as one piece, in case you need to pack it away and continue at another time.
4. Using an HB pencil start at one end and carefully trace around the main elements to create a simple line drawing.
5. Lift tracing paper every now and then to check what you have drawn.
6. Details such as vehicles and phone lines can be omitted from the drawing.
7. When complete, the drawing can be printed, reduced in size and even reduced to an appropriate scale.
8. A line drawing of an individual building can be copied for a number of students to work on at once. They could sketch in alterations to the building and experiment with different colour schemes and materials.
Mapping it out (Google maps)

How can you create maps and plans to help design spaces in the built environment?

Your tasks
- Produce an accurate site plan of a space.
- Create a panoramic image by stitching photos together.
- Create a virtual tour of your space.

Explore
Explore the process of designing a space for a specific purpose in Growing an idea.

Mapping an outdoor space

Producing site plans was once a complex task, with lots of measuring and sketching or expensive aerial shots from cranes or planes. Google Maps has made the job easier and more accessible.

Make a site plan of a space that could be redeveloped. An area in your school would be ideal. Your completed site plan can be used as a basis for redesigning a site.
### Outline the map

1. Open [Google Maps](https://www.google.com/maps) and type in the name of your school or other area you are able to visit.
2. Switch to Satellite view and use the Zoom In tool to get as close as you can to the area you are interested in. Drag the map to centre the area of interest. **Tip:** Click on the double arrows (<<) at the top left of the map to hide the text panel and see more of the map.
3. Press the Print Screen key on your keyboard (Fn + PrtSc on the DER-NSW laptop) to take a screen shot.
5. Use the Crop tool in the Tools panel to select the part of the image you want to keep. Press the Enter key to crop the image.
6. Use the Vector drawing tools, such as the Line tool, from the Tools panel to outline the important features.
7. Select and delete the original screen shot, leaving an outline of the site.

### Add detail

1. Visit the site that you are mapping.
2. Walk around the site to identify features that may not have shown up on Google Maps.
3. Take notes about what you see, photograph any special features and photograph some site panoramas (see Task 2).
4. Once your site visit is complete add your notes and photos to your Fireworks site plan.
5. Add colour to features such as plants using the Fireworks Property panel (select an object then change its fill or stroke colour).
6. Save your site plan as a PNG file (File menu > Save As).
Scale, key and compass points

Add the following.

- A scale to your site plan so that you know how big things really are. **Tip:** Look at the lower left of the Google Maps image to see a scale that you can transfer to your map.
- A key to your site plan so you can work out how objects are represented.
- Compass points. **Tip:** In Google maps North is always towards the top of the screen, so if you do not rotate your screen shot it is easy to add accurate compass points to your map.
**Drawing: Flat plan/elevation**

- The different elements of the street: houses, trees, street furniture, road signs and traffic lights are drawn as the student sees them, in elevation. These elements are drawn onto a plan which indicates the roads, pavements, markings and roundabouts.

- Students could sketch this type of plan/elevation during the walk, as a chalk drawing in the playground or on a large paper indoors at the conclusion of the walk.

- Details can also be added later using photographs for reference. These details may not only be architectural but include broken fences, an advertisement on a wall or graffiti. The plan/elevation can be labelled indicating the type of building, colours and materials used.

**Instructions**

1. Using the photographs supplied as reference, sketch a plan of the road from beginning to end of the area to be investigated, including road markings, pavements and roundabouts.

2. Now add all the elements of the area, drawing them in elevation around the plan. Use a simple outline to represent roof line and details such as windows and doors. Consider the different heights of each building as you draw. Are the trees as high as the buildings? How many buildings are on each side of the street?
Flat plan/elevation
Drawing: Detail worksheet

- Students will need a clip board, pencil and eraser if using the worksheet on a walk around a neighbourhood.
- Worksheet can also be used to record information based on a selection of photographs of buildings or images of buildings from the local paper and real estate magazines.
- Each student can be assigned a different building in the street.
- If on a walk, a rubbing of a texture could be used in the special feature box.

Instructions
1. Using the photographs of the street select a building.
2. Draw and record particular features and elements of the building including:
   - materials used
   - shape and pitch of roof
   - shape/proportions of columns, posts, arches
   - shape and style of windows and doors
   - decorative elements and any other noteworthy features
   - attempt to name the style and year of construction of this building

Example of a completed student detail
### Detail worksheet

<table>
<thead>
<tr>
<th>Sketch of house</th>
<th>Add any notes here</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draw typical window</td>
<td>Draw typical door</td>
</tr>
<tr>
<td>Draw special feature</td>
<td>Note the materials used to build the house</td>
</tr>
</tbody>
</table>
### Studio E: Register, log on and navigate


<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Register a User Name.</strong></td>
<td>![Register Image]</td>
</tr>
<tr>
<td>Register on first use to allow you to log in – user names and passwords are case sensitive.</td>
<td></td>
</tr>
<tr>
<td>The name you register will appear in the brief generated by the tool – so use the name that you want to appear for a project.</td>
<td></td>
</tr>
<tr>
<td><strong>2. Sign up for your new account to Create a user.</strong></td>
<td>![Sign Up Image]</td>
</tr>
<tr>
<td>Team projects will require a shared user name and password.</td>
<td></td>
</tr>
<tr>
<td>Multiple projects with the same user name will overwrite the previous entries.</td>
<td></td>
</tr>
<tr>
<td><strong>3. Log in with your User Name and Password.</strong></td>
<td>![Log In Image]</td>
</tr>
<tr>
<td>Enter the user name and password registered.</td>
<td></td>
</tr>
<tr>
<td>If you forget your:</td>
<td></td>
</tr>
<tr>
<td>• Password - enter the answer to the question you registered (currently an error message will appear)</td>
<td></td>
</tr>
<tr>
<td>• User name - enter the email address you registered to receive your user name.</td>
<td></td>
</tr>
<tr>
<td><strong>4. Read ‘What’s it all about’ then close.</strong></td>
<td>![What's it all about Image]</td>
</tr>
<tr>
<td>Close the ABOUT or TO DO pop-up on the splash page to enable rollovers to function and enter the tool.</td>
<td></td>
</tr>
<tr>
<td><strong>5. Roll over the splash page to reveal the links and click to enter.</strong></td>
<td>![Splash Page Image]</td>
</tr>
<tr>
<td>For a good starting point click on the camera.</td>
<td></td>
</tr>
<tr>
<td><strong>6. Select a section in the left hand navigation.</strong></td>
<td>![Left Hand Navigation Image]</td>
</tr>
<tr>
<td>Work your way through the left hand navigation to explore the structure of the tool.</td>
<td></td>
</tr>
<tr>
<td>Breadcrumbs track the visited pages leading from the home page to the currently viewed page.</td>
<td></td>
</tr>
</tbody>
</table>
7. Click the ‘electronic device icon’ to clarify what the section is ABOUT and what you need TO DO.

Each section and subsection is supported by ABOUT and TO DO pop-ups which are clicked to open and close or you toggle between.

8. Select a subsection from the top navigation.

Each section in the left hand navigation has a number of subsections accessed using the top navigation.

Use the next icon to access additional screens relating to a subsection where present and the back icon returns you to the previous screen.

9. Select the ‘sample project icon’ to view a sample project.

The project icons at the bottom of a number of screens feature excerpts from sample projects relevant to the section – a colour key, located in the ABOUT pop-up, indicates the source of the project material.

10. Key your responses into the text boxes and Save changes.

Text boxes enable you to key in a response which automatically fills in relevant sections of the Project brief – the wording may be edited at the initial point of entry or in the Project brief.

Save any entries/edits before advancing using the save changes icon to avoid losing the text - text box edits will overwrite existing entries in both sections when you save.

11. Review the development of the project brief by selecting the Project brief in the left hand navigation.

Click on the Example in the top navigation to preview a completed Project brief.
Select the print icon for a hard copy of the Project Brief.
Entries in the Project Brief extending beyond the text box will not be visible on screen – the print out will show the complete entry.
## Icons

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Electronic Device" /></td>
<td>The <strong>electronic device</strong> icon provides information about the section and what to do in the section. Close the ABOUT or TO DO pop-up to enable roll overs to function and enter the tool by clicking on the close icon. Click the ABOUT and TO DO to open and close or toggle between when in a section of the tool.</td>
</tr>
<tr>
<td><img src="image" alt="Close" /></td>
<td>The <strong>close</strong> icon closes the ABOUT or TO DO pop-up on the splash to enable roll overs to function and enter the tool.</td>
</tr>
<tr>
<td><img src="image" alt="Back" /></td>
<td>The <strong>back</strong> icon returns you to the previous screen where there is additional material relating to a subsection.</td>
</tr>
<tr>
<td><img src="image" alt="Save Changes" /></td>
<td>The <strong>save changes</strong> icon allows you to save information you enter into a text box. Save entries and edits before advancing to another screen to avoid losing the text. Edits will overwrite existing entries in the related section of the tool and the Project brief when saved.</td>
</tr>
<tr>
<td><img src="image" alt="Next" /></td>
<td>The <strong>next</strong> icon advances you to the next screen where there is additional material relating to a subsection.</td>
</tr>
<tr>
<td><img src="image" alt="Print" /></td>
<td>The <strong>print</strong> icon allows you to print out a hard copy of the <em>Project Brief</em> in a predetermined format.</td>
</tr>
<tr>
<td><img src="image" alt="Project" /></td>
<td>The <strong>project</strong> icons feature excerpts from sample projects relevant to the section. A colour key, located in the ABOUT pop-up, indicates the source of the project material.</td>
</tr>
<tr>
<td><img src="image" alt="Return" /></td>
<td>The <strong>return</strong> icon appearing at the end of entry boxes on the <em>Project Brief</em> screen returns you to the relevant section.</td>
</tr>
</tbody>
</table>
## Tips

| Registering | • Register on first use to allow you to log in – user names and passwords are case sensitive.  
  • User name is the name that will appear in documents generated by the tool – so use the name that you want to appear.  
  • Team projects will require a shared user name and password.  
  • Multiple projects with the same user name will overwrite the previous entries. |
|---|---|
| Logging in | • Enter the user name and password you or your team registered.  
  • If you forget your:  
    o Password  
      Enter the answer to the question you registered (currently an error message will appear this is being investigated)  
    o User name  
      Enter the email address you registered to receive your user name. |
| Entering | • Close the ABOUT or TO DO pop-up by clicking the close icon to enable roll overs to function and enter the tool.  
  • For a good starting point click on the camera. |
| Navigating | • Each section in the left hand navigation has a number of subsections accessed using the top navigation.  
  • ‘Breadcrumbs’ track the pages visited leading from the home page to the current page and indicates there are 1 or 2 pages in the section.  
  • Each section and subsection is supported by ABOUT and TO DO pop-ups which you click to open and close or toggle between.  
  • Subsections with text boxes enable you to key in a response which fills in relevant sections of the Project brief – this may be edited at the initial point of entry or in the Project brief.  
  • Use the next icon to access additional screens relating to a subsection where present.  
  • Use the return icon appearing at the end of text boxes on the Project brief screen to return to the relevant section.  
  • The project icons at the bottom of a screen feature excerpts from sample student projects relevant to the section – a colour key, located in the ABOUT pop-up, indicates the source of the project material.  
  • Preview a completed Project brief by clicking on the Example in the top navigation when in the Project brief section. |
- Complete the *Before survey* in the *Enterprise learning* section of the tool before commencing a project to help make learning explicit to students.
- Access the Enterprise learning website using the hyperlink in the footer.

### Saving
- Follow the prompt and save any entries/edits before advancing using the **save changes** icon to avoid losing the text. Entry box edits will overwrite existing entries in both sections when saved.

### Printing
- Select the **print** icon for a hard copy of the *Project brief*.
- View the tool on screen to optimise use – hard copies can be printed using the print function.
- NB the **ABOUT** and **TO DO** pops will overlay screen printouts when open.
- Entries in the *Project Brief* extending beyond the text box will not be visible on screen – the print out will show the complete entry.

### Other
- Text entry areas in the *Enterprise learning*, *Before* and *After* surveys will render differently depending on the browser, for example. entries extending beyond the area in *Internet Explorer* will wrap and in *Firefox* will continue along the line. Only text visible on screen is printable.
<table>
<thead>
<tr>
<th>Studio E section</th>
<th>Related classroom activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Situation</strong></td>
<td>As an introduction to this section of <em>Studio E</em> some non-computer related activities will need to be undertaken.</td>
</tr>
<tr>
<td>Students are challenged to:</td>
<td>For instance as a class, or in groups students may:</td>
</tr>
<tr>
<td>• think about situations that could be improved</td>
<td>• brainstorm situations where things have ‘gone wrong’</td>
</tr>
<tr>
<td>• look for opportunities to better meet someone’s needs</td>
<td>• list situations where students have observed accidents happen</td>
</tr>
<tr>
<td>• identify the obstacles or constraints that might get in the way.</td>
<td>• recall situations in which someone experiences difficulty with something</td>
</tr>
<tr>
<td></td>
<td>• evaluate existing products to see how well they do the job</td>
</tr>
<tr>
<td></td>
<td>• read the newspaper and discuss community or global issues.</td>
</tr>
<tr>
<td></td>
<td>Set a ‘fly on the wall’ homework task of watching someone do something, e.g. preparing a meal, maintaining the garden. Have students note problems that arise, for example where excessive force is required or where activities are dangerous.</td>
</tr>
<tr>
<td></td>
<td>Compile a class list of products that break frequently. Compile a class list of situations that are difficult because there is too little, too much or confusing information, e.g. finding the way around the school.</td>
</tr>
<tr>
<td></td>
<td>Survey students to find out how they spend their leisure time, what they find entertaining and/or when they are bored.</td>
</tr>
</tbody>
</table>

| **2. Needs** | Having identified a design situation many students will have a tendency to ‘solution jump’, that is, generate a design solution (probably in their imagination) before they have collected sufficient information about the users and/or the users’ needs. |
| Students are encouraged to be a design detective. They find out: | As students gain experience in design process methodology they come to appreciate the value of deferring the generation of design ideas until a later stage of the process. They also come to appreciate that creative and innovative ideas do not arrive spontaneously, but rather emerge from a careful study of the needs (and wants) of the user. |
| • what they need to know about the user | Ideally to complete activities in this section of *Studio E*, students should carefully identify the users of the design solution and gather information directly. This might involve one or more of the following activities: |
| • how the design will improve the situation | • questioning users about what is needed |
| • what the consequences will be for people | • interviewing others involved in the design situation about the needs of the users |
| • what the consequences will be for the environment | • directly observing and recording the design situation for later analysis. |
| • what solutions already exist. | |
### 3. Planning and managing

Students are assisted to work out:
- what has to be done
- how it has to be done
- when it has to be done.

In this section students will address:
- the drafting of the text of the design task
- the identification of resources that may be available for the project
- the drafting of criteria to be used to judge the success of the project
- the identification of challenges that may limit or inhibit the production of a quality solution
- the identification of sources of feedback
- planning of project timelines.

In many instances it may be necessary for the teacher to direct students to enter information in this section before completing earlier sections. For instance to meet syllabus or school organisation requirements, it may be important to specify some of the resources that are available for a project and/or to key-in set project dates or deadlines.

It is anticipated that many students will require support to draft the wording of their **project task**. It may be helpful for students to work through a couple of examples to draft a statement of a design task as a class or group activity. The wording of the task should:
- avoid describing a design solution
- be specific enough to guide and support design development, and
- be open enough to allow some creativity and lateral thinking.

For instance, students may 'design and produce a means of containing and organising personal classroom equipment such as pens, pencils, rulers, etc. Such a statement of the task supports more effective analysis and more creative design development than does one that states 'design and produce a pencil case'.

Similarly, many students will require guidance when drafting their **criteria for success**. It is important that they appreciate that the criteria are used throughout the design process and not simply to evaluate the success of an end product. They should value criteria as guidelines that help to keep the design solution heading in the right direction. Statements of criteria should be framed so that they respond specifically to the needs of the user. Very general statements of success criteria should be avoided. Statements such as, 'looks good' are not helpful.
Strategy name: SCUMPS model


Overview: As students work through exploring and defining the task they are often engaged in the process of listing attributes, that is, describing and exploring the qualities and/or features of existing products, systems or environments. They are thinking analytically. To aid students in this highly analytical task the SCUMP model helps them to analyse products.

SCUMPS

The acronym SCUMPS stands for:

<table>
<thead>
<tr>
<th>S</th>
<th>Size</th>
<th>How big is it?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Describe relatively (bigger than a ..., smaller than a...)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Describe comparatively (about the size of ...)</td>
</tr>
<tr>
<td>C</td>
<td>Colour</td>
<td>What colour is it produced in? Or colours commonly associated with the product.</td>
</tr>
<tr>
<td>U</td>
<td>Use</td>
<td>Who uses the design and for what purpose? Or uses most often associated with the product.</td>
</tr>
<tr>
<td>M</td>
<td>Materials</td>
<td>What materials are used to manufacture the design and why are these materials used? Or materials commonly used in the construction.</td>
</tr>
<tr>
<td>P</td>
<td>Parts</td>
<td>What are the main parts of the design? That is, the individual elements that make up the whole.</td>
</tr>
<tr>
<td>S</td>
<td>Shape</td>
<td>What shape is the design and why is it that shape? Or what are the shapes within?</td>
</tr>
</tbody>
</table>

Students use the SCUMPS model when products are under analysis in terms of their size, colour, use, material, parts, and shape. By using this model students will develop a better insight and understanding of the product.
Using SCUMPS for exploring and defining the task

1. Students analyse a product using the SCUMPS model. Students respond best when the actual product or a photograph of it, is made available to them during their analysis.

2. After students have analysed the product they are asked how the product could be improved by changing some of its qualities or features using the ‘What if …?’ questions on the following page.

This activity helps students describe and explore existing solutions as they explore the task and may also be the beginning of generating and developing ideas.

Using SCUMPS for evaluating the task

The ‘What if…?’ questions are powerful questions students could also use when evaluating.
S Size:
• How big is it?

C Colour:
• What colour is it produced in?

U Uses:
• Who uses the design and for what purpose?

M Materials:
• What materials are used to manufacture the design and why are these materials used?

P Parts:
• What are the main parts of the design?

S Shape:
• What shape is the design and why is it that shape?
### ‘What if…?’ questions

<table>
<thead>
<tr>
<th>S</th>
<th>Size</th>
</tr>
</thead>
</table>
| **‘What if …?’** | this product was a different size?  
Would this improve the design of the product? |
| **‘What if …?’** | we changed the size so that the product was ...  
– twice as big, twice as small  
– ten times bigger, ten times smaller  
– a hundred times bigger, a hundred times smaller?  
Might this change the way you use the product?  
Can you think of a new use for the changed product? |

<table>
<thead>
<tr>
<th>C</th>
<th>Colour</th>
</tr>
</thead>
</table>
| **‘What if …?’** | this product was a different colour or different colours?  
Would this improve the design of the product?  
Might this change the way you use the product?  
Can you think of a new use for the changed product? |

<table>
<thead>
<tr>
<th>U</th>
<th>Uses</th>
</tr>
</thead>
</table>
| **‘What if …?’** | we didn’t use the product in the way it was intended?  
Can you brainstorm some new uses for the product? |

<table>
<thead>
<tr>
<th>M</th>
<th>Materials</th>
</tr>
</thead>
</table>
| **‘What if …?’** | this product was made from different materials?  
Would this improve the design of the product?  
Can you make it cheaper?  
Can you make it more durable?  
Can you make it more versatile? |

<table>
<thead>
<tr>
<th>P</th>
<th>Parts</th>
</tr>
</thead>
</table>
| **‘What if …?’** | you increased or reduced the number of parts within?  
Would this improve the design of the product? |

<table>
<thead>
<tr>
<th>S</th>
<th>Shape</th>
</tr>
</thead>
</table>
| **‘What if …?’** | you changed the shape of the product or the parts within?  
Would this improve the design? |
Web sites

Curriculum Support web site

The Curriculum Support web site has been designed to support teachers in public schools and is produced by the Technology Unit, Curriculum K-12 Directorate, NSW Department of Education and Training.

Designing and producing K-12

The Designing and producing K–12 section of the web site focuses on the continuum of technology learning in NSW public schools and the technology process, that is, designing and producing (making).

Enterprise Learning
www.enterpriselearning.nsw.edu.au/

Studio E is located on the Enterprise Learning web site under the Middle Years button. The Enterprise Learning web site is a focal point for the development of an enterprise culture in schools K–12.
Centre for Learning Innovation (CLI)
www.cli.nsw.edu.au/cli

CLI develops learning resources across all contemporary media – including web, DVD, video, television and print. Learning design teams are complemented and supported by in-house media-production and information and communication technology (ICT) experts, and broadcast quality production facilities. All resources developed by CLI are available from the TaLE web site: www.tale.edu.au

- Architecture Insights
  http://architectureinsights.com.au

- Object Gallery
  Australian Centre for Craft and Design
  http://www.object.com.au
  - Abundant Education Kit: Abundant Australia showcases the exciting potential of Australia’s architects

- University of NSW Faculty of the Built Environment
  - The Sustainable Living Challenge

- Engaging Places UK
  http://www.engagingplaces.org.uk/home
  Engaging Places is an initiative by the Commission for Architecture and the Built Environment (CABE) in partnership with English Heritage. It is a resource to support teaching and learning through buildings and places.
  Download the free teaching resource:
  ‘School buildings from around the world’
- **Northern Architecture UK**
  
  
  - Ideas for teachers to explore in the classroom
    
    [http://www.northernarchitecture.com/docs/teaching_ideas.pdf](http://www.northernarchitecture.com/docs/teaching_ideas.pdf)
  
  - *Questioning Architecture* is a simple resource aimed at encouraging pupils to understand and critique buildings, places and spaces.
    

- **Beam UK**

  [http://www.beam.uk.net](http://www.beam.uk.net)

  Beam is a company dedicated to the imaginative understanding and improvement of the public realm – our urban and rural streets, buildings, parks, housing estates and public spaces.

  - Beam Ideas
    
    [http://www.beam.uk.net/ideas.php](http://www.beam.uk.net/ideas.php)

- **Alvar Aalto Museum Finland**

  - 9 Steps into Architecture including scale, symmetry, town planning and landscape
    
    [http://www.alvaraalto.fi/museum/education_material.htm](http://www.alvaraalto.fi/museum/education_material.htm)

- **Chicago Architecture Foundation USA**

  - Schoolyards to Skylines – Teaching with Chicago’s Amazing Architecture
    
  
  - The Architecture Handbook: a student guide to understanding buildings
    

- **Guggenheim Shelter Competition**