SpaceWise
better public places and spaces

NSW
Architects Registration Board
Enhancing built environment education in Technology 7-8

Presented by:
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Workshop overview

- Workshop materials
- Agenda page 5: Participant workbook
- Venue information
- Teacher sign-on
- Evaluation handout
Workshop aims – page 4

- become familiar with the built environment area of study Technology Years 7-8 syllabus
- explore the concept of the built environment and sustainability through engagement with a familiar public space
- confidently guide students in the design process to enhance creativity, design sensibility and appreciation of the role of architects, designers and builders in society
- experiment with teaching and learning strategies that build student spatial awareness and understanding, and related literacy and numeracy skills
- implement strategies to enhance the use of modelling, drawing, communicating and planning to generate creative ideas and solutions to authentic design situations.
1.2.1 Apply and use knowledge of the content/discipline(s) through effective content-rich, teaching activities and programs relevant to the stage.

2.2.3 Apply practical and theoretical knowledge and understanding of the different approaches to learning to enhance student outcomes.

6.2.3 Engage in professional development to extend and refine teaching and learning activities.
Introductions

- Name
- School
- Share a feature of the built environment that you noticed on the way to the workshop.
Session 1
Spacewise: an introduction
NSW
Architects Registration Board

- Funded and supported development of pilot program and workshop resources to enhance built environment education in Technology 7–8.
- The main functions of the Board are to:
  - protect consumers
  - register architects
  - inform the public
  - promote architecture.
- In order to be registered a person must have the prescribed university qualification in architecture and must have an approved period or experience in architecture or a minimum 3,000 logged hours of work experience covering the mandatory elements of competency; and pass the Architects Accreditation Council of Australia’s Architectural Practice Examination (APE).
- To be an architect you need to be registered. The degree only allows you to be a building designer.
Spacewise: overview

- Pilot program involved two schools:
  - Northern Beaches Secondary College, Manly Selective Campus
  - Strathfield South High School
- Spacewise focuses on better public places and spaces
- Students investigated a local public space and re-designed the space to better meet community needs.

Re-design a local public space so that it better meets the needs of those who use it.
Aims of program for students

Spacewise funded by NSW Architects Registration Board to enable students to:

• understand public spaces and be able to critically analyse spaces that they interact with
• appreciate quality in design, including reasoning for design choices, engineered structures, use of materials, sustainability, aesthetics etc
• explore the influence of ideas and expert designers on generation of design ideas
• understand the role of the individual in the decision making process
• use the design process effectively to design solutions to authentic design situations
Progression of learning in Technology K-12

- Kindergarten to Year 8 students develop capability with some technologies and learn to apply the technology process of designing and producing.
- Technological capability occurs over time, through sustained learning experiences in various contexts.
- Continuity of teaching K–12 increases the likelihood of rich learning outcomes.
- Continuity is promoted by the common use of language.
<table>
<thead>
<tr>
<th>Designing and making</th>
<th>Built environment</th>
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<tr>
<td>DM ES1.8</td>
<td>BE ES1.1</td>
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<tr>
<td>Generates own ideas and designs through trial and error, play, modelling and making.</td>
<td>Explores and identifies ways in which built environments suit their users.</td>
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<tr>
<td>DM S1.8</td>
<td>BE S1.1</td>
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<tr>
<td>Develops and implements own design ideas in response to an investigation of needs and wants.</td>
<td>Creates, modifies or models built environments to suit the needs of users.</td>
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<td>DM S2.8</td>
<td>BE S2.1</td>
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<td>Develops, implements and evaluates ideas using drawings, models and prototypes at appropriate stages of the design process.</td>
<td>Creates models and evaluates built environments reflecting consideration of functional and aesthetic factors.</td>
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<td>DM S3.8</td>
<td>BE S3.1</td>
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<tr>
<td>Develops and resolves a design task by planning, implementing, managing and evaluating design processes.</td>
<td>Creates and evaluates built environments demonstrating consideration of sustainability, aesthetic, cultural, safety and functional issues.</td>
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<td>S4</td>
<td>S4</td>
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<tr>
<td>Designs, produces and evaluates quality solutions that are functional and meet identified needs or opportunities.</td>
<td>Creates and evaluates built environments demonstrating consideration of functional, physical and material properties, aesthetic, ethical, environmental, socio-cultural, human form and scale and safety aspects of the development.</td>
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</table>
Spatial ability

- Spatial ability is an important skill for design-based disciplines.
- It can be defined as the performance on tasks that require:
  - the mental rotation of objects
  - the ability to understand how objects appear in different positions, and
  - the ability to conceptualise how objects relate to each other in space

Sutton, K. and Williams, A. (2008) University of Newcastle

- Need to support students to develop spatial skills as it does not come naturally to all.
## Continuum of learning: modelling

<table>
<thead>
<tr>
<th>Models</th>
<th>Early Stage 1</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
</tr>
</thead>
</table>
| The purpose of a model is to create a 3D representation of a large object or design. It can be a scaled copy of an actual object or prototype of a design. | • Use a variety of three-dimensional objects  
• Simple descriptions of model  
• Two-dimensional shapes constructed from a variety of materials, e.g. paper, straws | • Simple three-dimensional objects  
• Explain or demonstrate the making of a simple model  
• Two-dimensional shapes in different orientations | • From viewing a three-dimensional object, picture or photograph  
• Two-dimensional shapes constructed from a variety of materials  
• Comparing rigid frames  
• From drawings of different views | • Constructed from given drawings of different views  
• Explanation of why specific 3D objects are used in the built environment or appear in the natural environment  
• Description of how to construct a 3D model |
## Continuum of learning: drawing

<table>
<thead>
<tr>
<th>Drawings</th>
<th>Early Stage 1</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>The purpose of a drawing is to provide a pictorial representation of an object or event. Drawings include sketches, diagrams and maps. They can be accompanied by a heading/title, labels, arrows, captions and a scale to indicate size.</td>
<td>• Use straight and curved lines</td>
<td>• Produce different views of simple three-dimensional objects</td>
<td>• Attempt to show depth of simple objects</td>
<td>• Draw nets for 3D objects</td>
<td>• Show different orientations of 2D shapes</td>
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<tr>
<td></td>
<td>• Represent simple two-dimensional shapes</td>
<td>• Represent different orientations of two-dimensional shapes</td>
<td>• Show different orientations of two-dimensional objects from different views</td>
<td>• Show simple perspective through depth</td>
<td>• Create computer generated drawings of regular and irregular 2D shapes</td>
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<td></td>
<td>• Use computer drawing tools</td>
<td>• Use computer paint, draw and graphic tools to produce pictures or designs</td>
<td>• Construct computer generated drawings of 3D objects, attempting to show depth</td>
<td>• Draw regular and irregular 2D shapes</td>
<td>• Create computer generated drawings of regular and irregular 2D shapes</td>
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<tr>
<td></td>
<td></td>
<td>• Attempt to show depth of simple objects</td>
<td>• Draw three-dimensional objects from different views</td>
<td>• Enlarge and reduce regular and irregular 2D shapes, pictures and maps, including using computer software</td>
<td>• Make designs with rotational symmetry, including using computer drawing tools</td>
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<tr>
<td></td>
<td></td>
<td>• Show different orientations of 2D shapes</td>
<td>• Create tessellating designs by using computer drawing tools using copying, pasting and rotating regular shapes</td>
<td>• Make designs with rotational symmetry, including using computer drawing tools</td>
<td>• Draw maps and plans from an aerial view</td>
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<td>• Trace along sides of shapes to draw angles</td>
<td>• Draw simple maps and plans e.g. bedroom</td>
<td>• Use scale to calculate distance between two points</td>
<td>• Use scale to calculate distance between two points</td>
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<tr>
<td></td>
<td></td>
<td>• Draw simple maps and plans e.g. bedroom</td>
<td>• Make scale drawings from aerial view sketches and transfer to grid paper</td>
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</tbody>
</table>
Technology education process

- Exploring and defining the task
- Generating and developing ideas
- Producing solutions
- Planning, managing and evaluating throughout the process

(See Resource book, pages 7-14)
Curriculum Support
www.curriculumsupport.education.nsw.gov.au

Designing and producing K–12
Why study built environment?

• engage the community in thinking deeply about built environment, its key role in constructing sense of place, and its relationship to community and ecological sustainability

• relates well to the sustainability action process
Activity 1a: Memory map

The purpose of this activity is to become familiar with a teaching and learning strategy designed to increase student awareness of their local built environment.

- On page 6, *Participant workbook*, draw a plan drawing of the last 15 minutes of your journey to work.
- Highlight the features of the built environment you observe.
- Share your drawing with the colleagues at your table.
- Consider how you could use this strategy in the early stages of a built environment project.

**Sound byte 1**

**Sound byte 2**
What is a public space?

Our towns and cities are made up of buildings and different types of structures. The built environment is concerned with the spaces between and within these buildings and structures. Many of these spaces are private spaces while others are public spaces.
“Architecture is the thoughtful making of space.”

Louis Kahn

"I love this place because ..."

Community perceptions of the built environment

- The National Trust of Australia (NSW) launched “I love this place because…”, funded by the NSW Architects Registration Board, on 30 June 2008.
- People of all ages across Australia were invited to take a digital image of a built environment to which they feel a strong personal connection, and submit it electronically to the National Trust’s “I love this place because…” national photographic competition.
- A requirement of entry was submission of a vignette of 100 words or less to accompany the image, on the theme “I love this place because…”. The images and texts were captured in a weblog administered by the National Trust and run from a flickr.com platform linked to the Trust website.
“They did so with gusto. Images ranged from ocean pools to outback homesteads, ruins of the industrial era to graffiti walls to favourite rooms.”

The Board’s Registrar, Kate Doyle, said

“Architecture and the built environment affect all of us. ‘I love this place …’ was a great vehicle to encourage thinking about the impact of the built environment in our communities.”

Of the other entries the panel said, “The images and texts showed how strongly we feel sense of place and how history informs our environment. Many of the images succeeded in going past the personal to the universal.”
“I love this place because it considers the function of our built environment. The space before this bench doesn't conform to the usual picturesque environment, yet there is still beauty in its solitary placement like it is itself there to contemplate its function, or the beauty of the urban night. It makes me think of the way we view our surroundings, and consider how we interpret and take things for granted - the 'why' of the fundamental stuff of everyday.”

WINNER Andrew Finlayson, Park in Tempe, Sydney, NSW
Key messages

• Built environment is important to our sense of wellbeing, to community engagement and to individual and collective life stories.
• The places people love are exceptionally diverse: broad interpretation of built environment from places which would colloquially be considered architectural through to, for example, sculpture parks, quarries and a beach car park.
• The human dimension constructs perceptions of built environment: the success of a built place was a product of the quality of the human interactions or passions that that place accommodates or represents.

The pilot program

- Pilot program involved two schools:
  - Northern Beaches Secondary College, Manly Selective Campus
  - Strathfield South High School

- PowerPoint developed to capture teacher and student work and reflections.

spacewise_overview.ppt
Session 2
Exploring and defining the task
Exploring and defining

Involves the activities students undertake to establish the project brief:

- identify and explore a need or opportunity, considering the user and client
- identify constraints and available resources
- identify social, ethical and environmental issues
- establish criteria for a successful design solution
- set milestones.
Elements of public spaces

- Public spaces, in particular parks and squares feature seating, amenities, gardens, playgrounds and a range of shelters.
Design situation

Public spaces and places are used by numbers of people and often for different purposes. Over time the uses of public spaces change as do the needs of the people who use them. There are opportunities to improve public spaces by re-designing and developing them.

Student design task:
Re-design a local public space so that it better meets the needs of those who use it or who may use it.

Your task today:
Design a shelter for an identified design situation.
Bus stop shelter
Design a bus stop shelter for the street adjacent to the identified site.

Dimension hints
Seat: 450 mm wide, 400 mm deep
Standing room for 6 people: 600 mm wide, 500 mm deep per person

Picnic shelter
Design a shelter for a picnic area in the grounds of the identified site.

Dimension hints
Seat: 400 mm high, 400 mm deep, 450 mm wide per person
Table: 600 mm wide, 300 mm deep per setting
BBQ: 900 mm high, 600-1200 mm long, 500 mm deep
Research

Hinsby Park is located in Annandale, Inner West Sydney. The park features:

• hand-cut stone wall surrounding it
• four entrances, bordered by four streets
• small grave
• war memorial
• playground
• chess table
• street parking
• bus stop
Activity 2A: explore a public space

The purpose of this activity is to explore a public space using either a drawing or mapping activity.

Strategy: *Expert jigsaw*

- Half the participants on each table will complete:
  - Photographic elevation of site and surrounding area

- The remaining participants will complete a site plan using:
  - Google map (Laptop wrap: Google mapping it out)

- Report your observations to the whole group.
Studio E is an interactive learning tool that:

• explicitly scaffolds thinking for students in the *Exploring and defining* phase of the process
• allows students to develop a project brief
• enables students to gain ownership of project brief
• has a linear structure but enables iterative refinement
• allows self-paced learning and lateral approaches to thinking
• was developed for Stages 3 and 4 students.
Studio E

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.

Use identifiable user names and a common password so teacher can access. For example, khsname; password: kadina
Activity 2B

The purpose of this activity is to become familiar with Studio E and its use in developing a project brief.

- Examine the sample project brief generated using Studio E.
- In pairs (site plan person and photographic elevation person) complete the project brief.
- Discuss in pairs how you could work through this with students.
Consequences

The production and use of the project could have the following consequences:

• it could impact others by obstructing views, obstructing space

• developing the solution could impact on the environment by removing open space

• using the product could increase community use of the area
Criteria for success

For the design solution to be successful, it will need to:
• provide shelter from the elements
• be constructed using appropriate materials
• aesthetically pleasing
• create a sense of belonging
Minimise impact

During development of the project it will be important to minimise the impact of:
• noise for neighbours
• safety and security issues
• disruption to users of the park
• construction on environment, including plants, run-off
Resource book

- Register, log on and navigate, pages 26-27
- Icons, page 28
- Tips, pages 29-30
- Strategies for supporting students, pages 31-32

Next session:

- Architect presentation
- Scale
- Drawing
- Model: material or electronic
- Evaluation
Morning tea
Architect presentation
Session 3
Generating and developing ideas
Generating and developing ideas

- Involves students:
  - exploring options and considering existing solutions
  - identifying, exploring and selecting resources such as techniques, materials and equipment that will best achieve the solution
  - generating alternatives
  - representing and refining those ideas
  - deciding upon options, taking into account short-term and long-term impacts of their decisions and actions.
“Always design a thing by considering it in its next larger context – a chair in a room, a room in a house, a house in an environment, an environment in a city plan.”

Eliel Saarinen

A *parti* is the central idea or concept of a building. 

…it can be expressed several ways but is most often expressed by a diagram depicting the general floor plan...of a building and, by implication, its experiential and aesthetic sensibility.

A *parti* diagram can describe: massing, entrance, spatial hierarchy, site relationship, core location etc.

Activity 3A

The purpose of this activity is to generate and develop ideas for a shelter using a range of drawing techniques.

- Individually generate one idea for the type of shelter allocated to your group using freehand drawing – parti. **Sample drawings**
- Note the measurements of the base of the shelter, the height, the size of any furniture on the drawing. Grid paper may be helpful.
Designing with models

3D models – both material and electronic – can help you understand your project in new ways. The most useful model for designing is the building massing model – a quick material study by which you can easily compare and test design options under consideration.

Carefully crafted, highly detailed finish models are not useful as design tools, as their purpose is to document design decisions already made rather than help evaluate ideas under consideration.


Working models
Guggenheim shelter competition
Frank Gehry

- Frank Gehry, renowned architect of the Guggenheim Museum, Bilbao, Spain generates his designs initially from models.
- “…he dared to dream about buildings that transcend the rectilinear approach that defines so much of architecture”
Activity 3B

The purpose of this activity is to generate and develop ideas for a shelter using either a material or electronic modelling technique.

- In your group, whoever completed the Google mapping activity will now model a design in traditional materials. The other half of the group will use Google SketchUp to create an electronic model.
- In groups of 2 or 3 choose one design to model.
Evaluating

- An essential component of each phase.
- Evaluation throughout against the criteria for success, informs all students’ decisions.
- Evaluation at the conclusion involves reflection on and learning about the process used and the success of the solution.
Design process strategies

- Design process teaching and learning strategies
- Grid matching strategies to stages of the design

**Word documents:**
Designing and producing K–12

**OneNote notebook:**
Digital education revolution


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<th>Evaluating problems and solutions</th>
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<td>SCUMPS</td>
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<td>Y chart</td>
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<tr>
<td>‘So, what’s the problem?’</td>
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<td>Disadvantages/improvements</td>
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<td>Expert jigsaw</td>
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<td>Paired interviews</td>
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</table>
Activity 3C

The purpose of this activity is to evaluate your ideas for a shelter using the thinking strategy SCUMPS.

- Evaluate your ideas for the shelter using the questions on page 15, *Participant workbook*.

SCUMPS stands for size, colour, use, materials, parts and shape. It is a useful tool for generating and developing ideas but can also be used with a set of expanded questions to evaluate solutions.
Activity 3D

The purpose of this activity is to draw the modelled design to scale.

- Considering the modelling experience and the evaluation you have just completed, note any modifications to your initial freehand drawing.
- Draw a scale drawing of the shelter using grid paper.
Session 4
Producing solutions
Producing solutions

Involves students:

- completing design decisions
- completing final design representations such as production drawings or storyboards
- sequencing the step-by-step actions
- managing safety risks
- practicing and refining techniques
- completing the production of the solution.
Planning and managing

- An essential component of each phase.
- Management involves:
  - planning and reviewing achievement of milestones
  - implementing and monitoring time, action and financial plans.
Studio presentations

Show and tell and personal reflections
How do I teach this?

- Review the program summary by Kim Ihnatko, Strathfield South High School, page 5, Resource book.
- Review the Spacewise kit, see USB thumbdrive.
Documenting the process

- A scaffolded design folio can assist students to document the design process and allows teachers to highlight the aspects they want to assess in each project.

- Review the Spacewise design folio. Note how the questions give student direction.
Resources
Curriculum Support web sites

Curriculum Support web site

Designing and producing K–12


Designing and Producing K-12

The role of designing and producing in the Technology learning area

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

The continuum of technology learning is:

- based on students becoming increasingly sophisticated in their ability to design and produce solutions for authentic needs and opportunities
- mandatory for all students in each year of study from Kindergarten to Year 10 and articulated through the Science and Technology K-10 syllabus and the Technology (Mandatory) Years 7-10 syllabus
- an option for student specialisation in secondary school through a range of syllabuses addressing particular technologies and aspects of design.

Click here to view the continuum of technology learning K-12.

Why technology education is important

Participating fully in the 21st century involves people making effective judgements, often involving technology. Technology education involves the process of designing and then making what has been designed. If students

Generating & developing ideas

Planning, managing, evaluating

Exploring & defining the task

Producing solutions for authentic needs and opportunities
Technology education K–8: Design in practice


Welcome

This website documents the ASISTM project Technology education K–8: Design in practice. It is a professional learning tool designed for use by teachers to demonstrate features of effective design-based teaching and learning in authentic classrooms, focusing on the ‘look and feel’ of effective classrooms, a continuum of technology learning K–8 and teaching practices especially in the middle years.

Project partners:

Technology Unit, Curriculum K-12 Directorate, NSW DET
NSW DET schools
University of Technology, Sydney, Faculty of Design, Architecture and Building, School of Design
Design Institute of Australia, NSW Branch
Professional Teachers Council NSW
Kids’ Design Challenge

www.ptc.nsw.edu.au/kdc/

The Kids’ Design Challenge provides a unique opportunity for primary students to participate in a real-life design task of importance to the community. Students research a topical problem or issue and generate innovative solutions. They show initiative, make decisions, manage time and resources. They are creative, flexible and innovative.
Assessment for learning


Assessment task matrix
State/Territory selection

Idea generation
1 Description
2 Preparation
3 The task
4 Formative action
5 Annotated work examples

IDEA GENERATION

Learning area: Technology  Level: Years 7 and 8

1 Description
2 Preparation
3 The task
4 Formative action
5 Annotated work examples

Nature of the assessment task

Students analyse a design brief to identify the key aspects of the brief. They explain what investigation they have carried out to research aspects of the brief and identify what they have learnt from this that will help them with their designs. They generate a series of design ideas and consider which design or aspects of designs best address the brief.

Optional: They develop a production/management plan for making their final idea.

The success criteria for the completed assessment task are:
- an ability to identify the key aspects of a design brief and develop appropriate criteria for evaluating design ideas
- an ability to describe the findings of an investigation and explain how it will help to inform design ideas
- an ability to generate ideas to address the design brief
- an ability to assess the suitability of the design ideas by applying the appropriate design criteria previously developed
- an ability to select or develop a final design idea and justify selection
- an ability to clearly and effectively communicate design ideas using relevant communication techniques
- an ability to develop a clear, comprehensive and logically sequenced production/management plan (optional aspect of the task).
Object gallery

Google SketchUp


Laptop wraps: Google mapping

http://lrr.dlr.det.nsw.edu.au/Web/mapping_it_out/

Mapping it out
Laptop wraps

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

A photograph showing a park, a site map and compass

Syllabus links | Feedback | Teaching notes (.doc 108kB)

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.
Draw it

Architectural drawing

http://lrr.dlr.det.nsw.edu.au/Web/arch_draw/
Laptop wrap: Australian architecture


Australian Architecture
Laptop wraps

What architectural styles are represented in Australian architecture? What changes in architecture have resulted from the use of new building materials and new construction techniques?

Your tasks

- Create an inventory of the architecturally significant buildings in your local area.
- Create an archival record for a significant building.
- Create a virtual tour of a building.

Explore

Examine the significant periods of Australian architecture featured in Architectural drawing.

Syllabus links | Feedback | Teaching notes (.doc 108kB)
Design folios

Healthy spaces and places

http://www.healthyplaces.org.au

Healthy Spaces and Places is a national guide for planning, designing and creating sustainable communities that encourage healthy living.

Foremost it is for planners, as they can help tackle some of Australia’s major preventable health issues by planning places where it is easier and more desirable for more Australians to be active – walking, cycling and using public transport – every day.

But it’s also for everyone who can make a difference to the overall health and wellbeing of Australians – design professionals, health professionals, the property development industry, governments and the community.

Healthy Spaces and Places supports and complements planning and design initiatives throughout Australia. It is a single source of easy-to-find, practical information from experts in health, planning, urban design, community safety and transport planning.

This website includes:

- Design Principles
- Development Types
- Case Studies
- Making it Happen
- Frequently Asked Questions
- Getting the Message Out
Videos

• *Sketches of Frank Gehry* DVD, a documentary by Sydney Pollack

• *My Architect: A son’s journey* DVD, a documentary by Nathaniel Kahn on the life of Louis Kahn
Contacts

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