Identifying design problems

Design problems present opportunities for students to apply a design process and develop innovative solutions to real-world problems. Solutions are ideas and products developed by students in response to the design problem.

Possible design problems

The design problems presented in Table 1 are of differing levels of complexity and require different levels of independence. The design problems presented below each specify the following:

- whether the design problem is appropriate for Year 11 or 12
- a context that identifies either an individual or community focus
- the need or opportunity that requires ideas and products to be developed by students in response to the design problem
- suitable for design folios or a report.

These problems are provided as examples only. Teachers are encouraged to develop design problems suitable to the students and the facilities available at their school.
Table 1: Possible design problems

<table>
<thead>
<tr>
<th>Context</th>
<th>Possible design problems</th>
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<tbody>
<tr>
<td><strong>Personal</strong>&lt;br&gt;Design a solution to an identified personal need or an opportunity for a particular person.</td>
<td>Time is a precious commodity, particularly when it is consumed by school, family, work and social commitments. Pressures often impact on your study habits. How could you organise or structure your study environment to create more efficient study habits? Appropriate for Year 11, relevant for an individual focus, suitable for a design folio</td>
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<td><strong>Domestic</strong>&lt;br&gt;Design a solution to an identified human need or opportunity within the home or the household.</td>
<td>Household items are often mass produced to meet a profit margin. Although they meet a need and are in demand, they lack individuality and sometimes quality. Design a household item that meets your own or your family’s need for a unique solution. Appropriate for Year 11, relevant for an individual focus, suitable for a design folio</td>
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<td><strong>Commercial</strong>&lt;br&gt;Design a solution to an identified human need or opportunity within a commercial environment, e.g. local businesses.</td>
<td>Identify an occupational health and safety issue that presents itself in a nominated work environment. How can the risk associated with the identified hazard be reduced? Note: The issue chosen by students should be significantly challenging to allow them to engage in complex problem solving. Appropriate for Year 11, relevant for an individual focus, suitable for a design folio</td>
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<td><strong>Agriculture</strong>&lt;br&gt;Design a solution to an identified human need or opportunity that may relate to tools and products for the farming community.</td>
<td>Identify a piece of equipment and re-engineer a component to improve its function for users. Appropriate for Year 12, relevant for an individual focus, suitable for a design folio</td>
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<td><strong>Environment</strong>&lt;br&gt;Design a solution to an identified human need or opportunity for the control and preservation of nature in a responsible and sustainable manner, e.g. alternative power sources, waste management, and industrial ecology.</td>
<td>In Australia, in excess of 30 million toothbrushes are used and disposed of by Australians each year, amounting to approximately 1000 tonnes of landfill annually (<a href="http://greenchickadee.com.au/item_114/Bamboo-Environmental-Toothbrush.htm">http://greenchickadee.com.au/item_114/Bamboo-Environmental-Toothbrush.htm</a>). The plastic they are made from will not break down in our lifetime, nor that of our children. Write a report that proposes alternative uses for used toothbrushes, or redesign a toothbrush to reduce its environmental impact. Appropriate for Year 11/12, relevant for community focus, suitable for a report</td>
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<td><strong>Transport</strong>&lt;br&gt;Design a solution to an identified human need or opportunity for the application of resources to move people and goods.</td>
<td>A council wants to increase patronage for its bicycle hire scheme. It is a legal requirement to wear a helmet. Users often provide their own and carrying a helmet is often not convenient. Redesign the way the bicycle helmet is carried to maximise portability. Appropriate for Year 11/12, relevant for either individual/community focus, suitable for a design folio</td>
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### Identifying design problems for a community

In Year 12, students must respond to a design problem for a community. When students identify and describe their own design problem for a community they should:

- look for an authentic need or opportunity in the community, e.g. consider problem, situation or challenge which may be resolved by designing or redesigning a product. Students may interview people, search local newspapers, community magazines and radio to gain insight into a possible need or opportunity and determine a clear benefit to the community
- ask themselves the following questions:
  - what is the problem?
  - what is the context?
  - why is it a problem?
  - what is causing the problem?
  - who will benefit from solving the problem?
- discuss the problem with other people in their area to see if they agree that it is a problem
- consider the scope, conditions and specifications under which the design problem will be solved.

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| **Communication**  
Design a solution to an identified human need or opportunity that enables people to communicate with each other. | Has anyone seen my mobile phone? This is a common question in homes across the nation.  
Design a solution for people to easily find their phone. |

Appropriate for Year 11, relevant for either individual/community focus, suitable for a design folio

| **Health**  
Design a solution to an identified human need or opportunity within fields such as medicine, aged care, alternative medicine, physiotherapy and general wellbeing. | Kindergartens educate young children within a safe and fun learning environment.  
Design a device/toy that will develop a child’s fine motor skills during their time attending kindergarten. |

Appropriate for Year 11, relevant for community focus, suitable for a design folio

| **Recreation**  
Design a solution to an identified human need or opportunity to provide for indoor and outdoor leisure and recreational pursuits. | Recreational fishing, incorporating boating, is a popular leisure pursuit in Australia, enjoyed by people of all ages. Injuries occur when boarding and disembarking from boats.  
Design a piece of equipment so this aspect of boating can be made safer for people of all ages. |

Appropriate for Year 12, relevant for community focus, suitable for a design folio