

STEM by Design – Accessible Cities
A STEM Program for Years 5-6 from DATTA Vic
Teacher Notes



The Design Challenge:

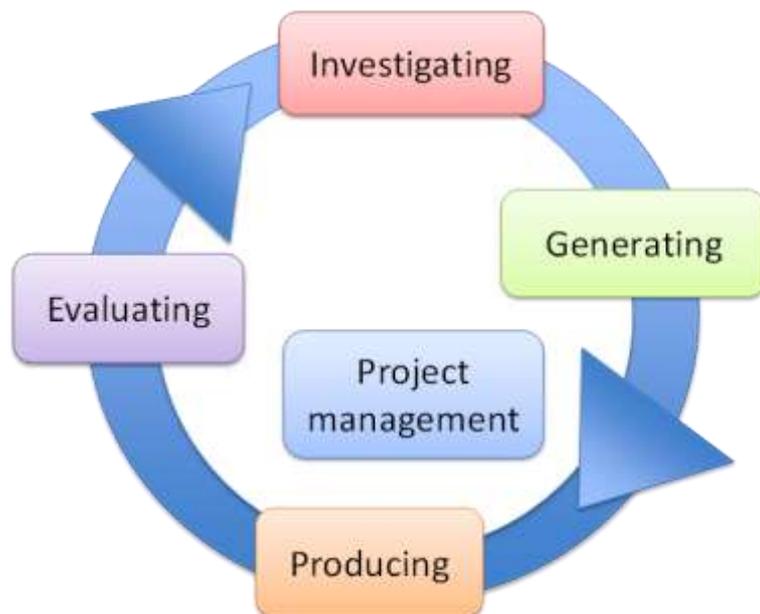
More than half the world's population now live in cities. Cities can be great places to live. They provide opportunities for business, education, and the exchange of ideas. However, not everyone finds cities easy and safe to navigate and live in. Your task is to identify a group of people that may find Melbourne's CBD challenging, understand their point of view, and design a solution to help overcome their challenges.



Photo credit: www.abilities.com

In your groups, research, discuss & record your answers to the following questions on the worksheet provided.

The Design Process:



Steps:

*Note: These steps are only a guideline- the design process doesn't always happen in this order, and are often re-visited. Depending on the situation, some steps may require more time and effort than others, and you may revisit different steps throughout the project. For example, you may work through the process till the **evaluation** step, and then return to **generating** to review some of your ideas.*

Design Process Step	Design Process description	Essential questions for this challenge	Activity ideas to address this step
INVESTIGATING	<ul style="list-style-type: none"> -Investigating and identifying a problem, opportunity or need -Writing a design brief outlining the problem or opportunity, intended users, requirements and limits, and identifying criteria for success -Researching for information and inspiration 	<p>Who are we making Melbourne more accessible for? What challenges does the CBD present to this specific group? Is there a way we can learn about this first-hand? How might we make Melbourne more accessible for people with a particular disability? What do we need for this to be successful?</p>	<p>Active brainstorming or relay brainstorming to identify groups relevant to this challenge</p> <p>Visit the city if possible, role play or find other ways to empathise with the end user</p>
GENERATING	<ul style="list-style-type: none"> -Drawing ideas (small quick drawings and more detailed drawings) and critically selecting and justifying the best idea to develop -Experimenting with modelling, 3D digital drawings and materials to assist choices 	<p>How might this help our end user?</p> <p>What crazy ideas do you have to solve this problem? Use your imagination!</p>	<p>See notes below about introducing constraints to support students</p>
PLANNING & MANAGING	<ul style="list-style-type: none"> -Managing the project, the team and all safety risks -Planning for production: steps to follow, expected time, costs and resources -Using digital tools (where appropriate) 	<p>What will this solution look like? How will it work?</p> <p>Is this a physical solution? A digital solution? A service or policy change?</p>	<p>Prepare and create a prototype</p> <p>Use physical materials like cardboard, etc.; 3D printing is a good option for prototyping; or digital prototyping with apps like Marvel</p>
PRODUCING	<ul style="list-style-type: none"> -Making the product, service or system safely and accurately, modifying when necessary -Documenting the production work with photos and written annotations (journal) 	<p>Is this practical? Does it work? Is it sustainable?</p> <p>Will people use it?</p>	<p>Try out your prototype, even better if the people who will be using it can test it and give feedback</p> <p>After at least 3 rounds of testing and tinkering, create a final design</p>
EVALUATING	<ul style="list-style-type: none"> -Using the criteria for success to evaluate design ideas, materials and processes used, solutions and their sustainability 	<p>Does this address the issue we identified at the beginning?</p> <p>Does it meet our criteria?</p> <p>Is this appropriate for the end user?</p>	<p>Compare final design to the evaluation criteria, and if possible, present it to the people you are designing for</p>

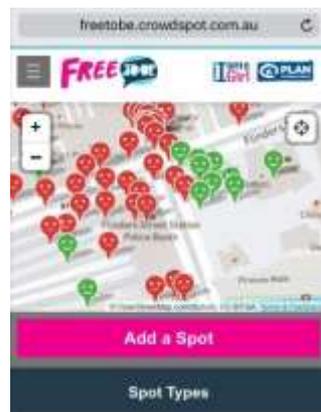
Notes for teachers:

- To increase the challenge level, or support students who may struggle with such an open-ended task, introduce appropriate design constraints, such as a budget, specific materials, etc
- Spend longer than you think on the investigating stage: spend time brainstorming groups that may find the CBD challenging and find ways to really put students in those user's shoes and empathise. Some examples below, but consider everything from tourists to international students, people with ASD sensitivities, physical disabilities, or people whose culture is different to the dominant Aussie culture.
- The solutions are limitless, though for your classroom's purposes, you may choose to limit them. For example, you may ask students to design an app, or a physical solution they can build.
- The final presentation may be more effective if it is to the end user (or other students role playing the end user)

Resources:

Free To Be App

<http://www.abc.net.au/news/2016-12-08/free-to-be-online-map-shows-where-women-in-melbourne-feel-unsafe/8103410>



City of Melbourne Accessibility website

A study of how people with sensory disabilities (blind, deaf, deafblind) experience Melbourne

<https://today.design/work/city-of-melbourne-accessibility/>



Curriculum Links:

- Digital Technologies
- Design & Technologies
- Cross Curriculum Priorities
 - Sustainability
- General Capabilities
 - Intercultural Understanding
 - Ethical Understanding
 - Personal & Social Capability

