

# Design dilemma

## PTV outcomes

- Students understand the personal and societal benefits of public transport
- Students understand why their actions are important to being safe on and around public transport
- Students know how to be safe on and around public transport

## Duration

Sequences are intended to be delivered in 2–4 lessons.

## Overview

In this sequence of learning students will develop awareness of the needs of diverse commuters on our public transport system. Their focus will be on how commuters can safely travel on public transport, especially in regard to getting on and off – boarding and alighting. Students investigate the challenges involved in getting on and off transport for users with additional needs, for example commuters in wheelchairs. They identify the specific needs and relate these back to the safe use of public transport.

Students work collaboratively in teams to investigate possible design solutions for making it easier for users with additional needs to safely access and travel on public transport. They generate designs and prototypes and present their solutions.

Students evaluate the designs produced in terms of meeting the criteria of the project, their simplicity and efficacy, and their contribution to safe use of public transport. This sequence focuses on train travel, but could be readily adapted to any form of public transport.



## Curriculum alignment

### Design and technologies Levels 5–6

#### VCDSTS033

Investigate how people in design and technologies occupations address competing considerations, including sustainability, in the design of solutions for current and future use

#### VCDSCD038

Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended designed solutions

#### VCDSCD039

Generate, develop, communicate and document design ideas and processes for audiences using appropriate technical terms and graphical representation techniques

#### VCDSCD041

Negotiate criteria for success that include consideration of environmental and social sustainability to evaluate design ideas, processes and solutions

## Engage

Introduce the learning sequence by tuning students in to the topic of catching public transport, with questions such as:

- How do people get around when they are not using cars?
- Who has used public transport to get somewhere? Why? How often?
- Why might people choose to use public transport instead of a car?

Collate the student answers on a whiteboard or in an online document or blog. To further focus the discussion on trains, ask questions such as:

- Where are the places you can get to or from using trains?
- What is travelling on a train like?
- How is it different to using other forms of transport?

Ask the students to write or record a brief retelling of an experience they have had getting onto, travelling on or getting off a train. Encourage them consider in some detail what they experienced getting on and off the train and ask them to share their experiences with the class.

## Explore

Show students a range of images or videos of metropolitan and regional trains and train stations. The resource Trains and Train Stations includes some useful images.

Ask the students what they notice when looking at these images. Given what they see, how do they think people get on and off trains safely in these situations?

Guide students in a discussion to identify what they believe is the suggested routine and appropriate behaviour for getting on and off a train. Collate their ideas as a list or step-by-step routine that could be followed when they arrive at a station, prepare to board, get on the train and be ready to travel.

Ask students to focus on behaviours that emphasise safety. They might also consider safe behaviours appropriate to different times of day when the numbers of commuters, and possibly the types of commuters, will also be different.

## Explain

Introduce the term 'accessibility' to students. Explain that accessibility is the design and implementation of technologies, items and spaces to improve access and usability for people with a disability or additional needs. Ask them to name examples of accessibility that they know of. There may be examples in the home, in the design of appliances, in general building design, in public outdoor spaces and in relation to public transport.

Facilitate a discussion with students that compares and contrasts the steps an able-bodied person with no additional needs and someone with additional needs would go through to get on or off a train safely. The step-by-step routine they have already identified can be used to support this discussion.

Students can consider how people with additional or different needs would be able to access a train safely and easily, step by step. What challenges would be presented, for example, to a commuter in a wheelchair, using a walking aid, with impaired vision or hearing etc.

Share a range of resources with students to develop their knowledge of how public transport and in particular trains and stations can be made more accessible to people with a wide range of needs. The resource sheet Accessibility provides signs and photographic examples, and other possibilities could include:

- Travellers aid website (<http://www.travellersaid.org.au/>)
- Accessible trains page on the PTV website (<https://www.ptv.vic.gov.au/more/travelling-on-the-network/accessibility/>)
- exploring the accessibility information for each metropolitan train station on the PTV website (<https://www.ptv.vic.gov.au/getting-around/accessible-transport/>)
- reviewing the Victorian Equal Opportunity and Human Rights Commission summary of the Disability Standards for Accessible Public Transport and discussing how they have been applied to train accessibility, especially pages 9–10, which focus on train travel ([https://humanrightscommission.vic.gov.au/media/k2/attachments/Whos\\_on\\_board-Public\\_transport\\_for\\_people\\_with\\_disabilities\\_in\\_Victoria.pdf](https://humanrightscommission.vic.gov.au/media/k2/attachments/Whos_on_board-Public_transport_for_people_with_disabilities_in_Victoria.pdf))

## Elaborate

Begin by reminding students of the challenges that people with additional needs may encounter when getting on or off trains at metropolitan and regional stations around Victoria. Some further examples they may offer could include:

- time or inconvenience involved in requesting and waiting for a wheelchair ramp to be deployed
- challenges for vision- or hearing-impaired travellers in regard to announcements or signage
- difficulties faced on busy platforms or in crowded trains as opposed to quieter, less busy travelling times.

Ask students to choose a focus issue for their design challenge. Explain that they will be designing a solution that will help someone with additional needs – which they should specify – to use a train more safely, particularly boarding and alighting.

Explain that their solution could be a physical product, a process, a new set of rules or communication mode (such as an advertisement or series of text messages).

The criteria for success for their design challenge could be set by the teacher or negotiated with students depending on capabilities. Some possibilities might include, that:

- the design is safe for everyone to use
- the specific need or issue is clearly stated and obvious throughout the design
- there is a clear plan/design process illustrated to show how the solution has been developed – it may also involve user testing and an iterative approach
- the solution can be a physical item, a new process, a set of rules or a communication idea
- the solution addresses a specific challenge for a group of train users with a specified disability or additional need. Students should explain and demonstrate how their solution meets that identified need.

Resources required for the design process could include:

- paper and pencils/markers
- cardboard and tape
- miscellaneous construction resources such as skewers, icy pole sticks and glue
- other readily manipulated materials as needed or available.

Allow students to form small groups (or assign students to groups) and begin working on their designs.

During this time, teacher can circulate throughout the room posing leading questions to students about their ideas, ensuring that students are thinking creatively about how their solution meets the challenge they identified.

When all groups have completed their design, the class can take a 'gallery walk', allowing all students to view the designed solutions of other groups.

## Evaluate

Explain to the students that a key part of any design process is evaluation – what is the problem and how successfully does a proposed or designed solution actually solve that problem or meet the aims of the intended design. And what might happen next to further fine tune the design.

Remind students of the criteria they identified before they began planning and designing. Ask each group to present their designed solution to the class.

Students should focus their presentation on:

- the challenge they identified and the features of the solution
- how these features help address the challenge identified
- how the solution meets the criteria
- any changes or next steps they would make if they had more time.

Other students can provide constructive feedback and perhaps suggestions where further design ideas could positively build on those presented. Finally, students can write a short reflection about what they have learned about the challenges of designing for a diversity of users, all of whom need to feel confident in travelling safely on public transport, in particular via train.

