

**Remember:
read the
Teacher Notes
first!**

Health and PE

Years 9 and 10

Lesson 1

Bringing in ideas about the hazards for people moving in and around the rail network in urban or rural areas

Learning intention

Describe hazards for pedestrians on the rail network.

We have provided assessment rubrics at the back of this document (Appendix) for guidance as to how students may achieve the learning intention to differentiated standards.

1.1 Define terms

- **What is a rail network?** (Physical assets: *terminal facilities, rail yards, railway stations, tracks, overhead wires, rail substations, level crossings, overbridges and pedestrian walkways, tunnels, bridges, signalling systems, communication systems*; administrative processes and regulations; personnel and management required to repair tracks, sell tickets, schedule trains etc.)
- **What is a hazard?**
- **What is physical activity?** (Walking, running, cycling)

Ask students to work in small groups to:

- **Identify** the location of the physical assets of the rail network in an identified area. Highlight these assets on a print map of the area or add them as annotations to a Google map: <http://www.google.com/earth/outreach/tutorials/custommaps.html>
- **Include** digital images and descriptions of the assets and their potential hazards.
- **Ask** people in the local community about the rail assets in the local rail network. Add any local descriptions, stories and/or local opinion to the map.
- **Take** photos or find copyright-free images of the assets on the rail network and use them to create a class visual glossary of terms. Use photo editing software to annotate the images.

Online photo editors include:

- Canva: <https://www.canva.com/>
- Pixlr: <http://pixlr.com>

Extension: Ask students to make a community picture book or slideshow about places on your local rail network. Photograph, sketch or take a screenshot on Google Maps of different places on your local rail network. Interview local students and/or their families and collect their stories about the places as audio files or text descriptions. Insert the memories about the place (text or embedded audio file) against each image. Place your book online so that your community can see it. Encourage your local community to provide new material (images and memories) for the book.

1.2 Describe pedestrian behaviour

View: Dynamics of Crowds: <https://youtu.be/Txrs4ssiAz0>

Ask students to identify a place in the school grounds and observe (in person or by moving images (webcam) how pedestrians use this place in ways that keep themselves free from injury or harm:

- **Identify** individual pedestrians walking in this place.
- **Watch** individual pedestrians avoid hazards (such as colliding with others) by altering their individual pace and/or direction.
- **Describe** how individual pedestrians avoid hazards when they move across a space.
- **Repeat** these observations of individual pedestrians in this place in crowded and uncrowded conditions.

Note: When walking in a public space in the presence of others, individual pedestrians tend to move towards the empty spaces they see and adjust their pace to keep a safe distance for any obstacles to their movement. This behaviour can create lanes of pedestrians moving in one direction through crowds.

Reference: M. Moussaïd, D. Helbing, G. Theraulaz. How Simple Rules Determine Pedestrian Behavior and Crowd Disasters. Proceedings of the National Academy of Sciences, 2011; DOI: 10.1073/pnas.1016507108

Ask students to:

- **Identify** pairs and/or small groups of pedestrians walking in this place.
- **Watch** pairs and/or small groups of pedestrians move across the space avoiding hazards (such as colliding with others) by altering their group structure, pace and/or direction.
- **Describe** how pairs and/or small groups of pedestrians avoid hazards when they move across a space.
- **Repeat these observations** of pairs and/or small groups of pedestrians in crowded and uncrowded conditions.

Note: Small groups of pedestrians will choose to walk side by side if they have enough room. As the space becomes more crowded, the pedestrians in the middle of the group fall back and the pedestrians at the sides move towards each other so that the group forms a “V” or “U” shaped pattern. This significantly reduces walking speed but allows the group members to keep talking to each other. Pedestrians trying to walk in the opposite direction are forced to take avoidance action to move past the group.

Reference: M. Moussaïd, N. Perozo, S. Garnier, D. Helbing, G. Theraulaz, G. Chirico. The Walking Behaviour of Pedestrian Social Groups and Its Impact on Crowd Dynamics. PLoS ONE, 2010; 5 (4): e10047 DOI: 10.1371/journal.pone.0010047

Ask students to:

- **Identify** possible pedestrian hazards presented by objects – for example, posts, pillars, fences, benches, steps.
- **Identify** possible pedestrian hazards presented by other pedestrians – for example, exuberant, reckless, dangerous, threatening or aggressive behaviour by other pedestrians.
- **Explain** how and why objects and other pedestrians can present a hazard to pedestrians.

Note: In dense crowds, pedestrians can get caught up or trapped in a crowd surge, be crushed by other pedestrians, crushed against a barrier or other object, or fall and be trampled by other pedestrians.

As a class, discuss why the way young people move in groups may present special hazards for themselves and for other pedestrians on the rail network.

Extension: Ask students to model pedestrian behaviours in crowds. Use the learning activities suggested in The Physics of Crowds: <http://www.scienceinschool.org/2011/issue21/crowding>

1.3 Identify hazards for young people walking in places on and around the rail network

NOTE: Students could practise this observation activity in a place within the school grounds.

Ask students to:

Identify a place on or around the local rail network.

<i>railway stations</i>	<i>platforms</i>	<i>level crossings</i>	<i>overbridges</i>	<i>pedestrian walkways</i>
<i>tracks</i>	<i>rail yards</i>	<i>terminal facilities</i>	<i>overhead wires</i>	<i>rail substations</i>

Observe pedestrian behaviour of young people on or around a place on the local rail network – railway station platform, level crossing, escalators, overbridge, pedestrian walkway etc.

List the different reasons why young people walk in this place on and around the rail network.

Identify a group of young people who may be at risk of a fall or another train-related injury when walking in this place on the rail network.

Organise a “safety walk” through the area with the local rail authority.

Invite members of the group you have identified as being at risk to join you and take part in the “safety walk”.

On the visit, ask students to:

- **Practise** walking safely through a place on the rail network.
- **Apply** strategies to keep safe when walking through a place on the rail network.
- **Identify** possible pedestrian hazards you meet when walking through a place on the rail network using the attached **Hazard checklist**.
- **Identify** possible management strategies for pedestrian hazards you meet on the rail network.
- **Take** notes, photos or video to record these potential pedestrian hazards and possible management strategies for the place.
- **Record** any “safety walk” feedback and suggestions from the group representatives.

- **Record** any “safety walk” feedback and management suggestions from the local rail authority supervising the visit.

Ask students to create a blog post, multimedia presentation or infographic that outlines the risks to the identified group of pedestrians in the place on the rail network. This report should:

- **Identify** the target audience for the report.
- **Identify** a group of young people you consider to be at risk.
- **Identify** the location of the place on the rail network in your local area (e.g. on an annotated Google map).
- **Describe** the potential hazard/s to pedestrians, using sketches and photos to elaborate your description.
- **Explain** why these are potential hazards for the identified group of pedestrians.

To develop their blog post, multimedia presentation or infographic, ask students to:

- **Do research** by looking at examples of how others have used infographics, blog posts or multimedia to do a similar task. Search for rail safety infographics, blog posts or multimedia presentations on Google Images and YouTube.
- **Create** your report outlining the risks to young people walking in an identified place on the local rail network.
- **Seek feedback** on how effectively it communicates your message to your target audience and adapt the report as needed to make it more effective.

Extension: Ask students to present their report to young people in your local community and the people who look out for them – for example, students at your school, parents, local business owners and/or local body politicians.

Hazard checklist

Some example answers have been provided. Add any potential local hazards that are not already on the list.

Potential hazard for pedestrians	Where is the hazard?	Why does it present a health and safety hazard for pedestrians using the place?
Surfaces clearly marked as hazardous e.g. "yellow line" areas at stations or yellow cross hatch zones around level crossings		
Poorly lit surfaces and areas		
Uneven surfaces e.g. service covers on footpaths		
Change in materials making the surfaces		
Gaps between surfaces		
Loose material surfaces e.g. gravel shoulders on rural roads		
Steps, stairways or escalators		
Ramps		

Potential hazard for pedestrians	Where is the hazard?	Why does it present a health and safety hazard for pedestrians using the place?
Absence of marking distinguishing steps from ramps		
Lack of grab rails where levels change		
Poorly maintained surfaces		
Surfaces that may become wet and slippery		
Rubbish on surfaces		
Rapidly moving trains in close proximity to pedestrians	Railway platforms, level crossings	Because the rapidly moving train creates gusts of wind (flow draft) by pushing through the air and then the displaced air back-fills the space left by the train, pedestrians may lose their balance and fall.
Rapidly moving trains in the same space as pedestrians	Anywhere on the rail corridor where pedestrians unintentionally or intentionally move onto the tracks – because they trespass, ignore safety signs	

Potential hazard for pedestrians	Where is the hazard?	Why does it present a health and safety hazard for pedestrians using the place?
	and signals, or slip, trip or fall etc.	
Vehicles sharing the same spaces as pedestrians		
Cyclists, skateboarders or people on scooters sharing the same spaces as pedestrians		
Joggers, runners, people walking dogs or dragging suitcases sharing the same space as pedestrians		
More than one pedestrian sharing the same space		
Objects that could topple over or collapse onto pedestrians		
Objects that could block movement or narrow the available access for pedestrians		
Places where queues could develop or people		

Potential hazard for pedestrians	Where is the hazard?	Why does it present a health and safety hazard for pedestrians using the place?
congregate and block or disrupt movement of pedestrians		
Hazardous areas where pedestrians could be pushed or shoved by sudden movements in a crowd		
Cross-flow areas where pedestrians will cross paths getting to different places		
Noisy environments (external or through use of personal music players) distracting pedestrians from warning signals, bells, sirens and other hazards		

Appendix: Differentiated assessment rubrics

We have provided guidance for how students may achieve differentiated standards within these learning activities.

Health & Physical Education

This rubric may assist you in assessing student achievements within the Australian Curriculum. Results can be recorded via your usual assessment record method.

Describe hazards for pedestrians on the rail network.

Extended ideas	My description identifies several relevant hazards on the rail network AND explains why these are hazards to pedestrians AND makes a generalisation about the hazards for pedestrians on the rail network.
Connected ideas	My description identifies several relevant hazards on the rail network AND explains why these are hazards to pedestrians.
Loose ideas	My description identifies several relevant hazards to pedestrians on the rail network.

Rail Safety

This rubric may assist you in assessing student achievements within the suggested rail safety outcomes of this lesson. Results can be reflected in the included [assessment of learning](#).

Identify potential hazards on and around the rail network.

(What are potential hazards on and around the rail network?)

Extended ideas	<p>I can identify many relevant hazards for people on and around the rail network <i>[using text, oral language, drawing, visual arts, dance, drama, music etc.]</i> AND can explain why these hazards need to be managed to keep people safe AND can reflect on my role in helping to manage these hazards.</p>
Connected ideas	<p>I can identify many relevant hazards for people on and around the rail network <i>[using text, oral language, drawing, visual arts, dance, drama, music etc.]</i> AND can explain why these hazards need to be managed to keep people safe.</p>
Loose ideas	<p>I can identify many relevant hazards for people on and around the rail network <i>[using text, oral language, drawing, visual arts, dance, drama, music etc.]</i></p>