

NZ Transport Agency Rail Safety Resource – Primary – Level 1 to Level 4 Social Sciences			
What is the big idea or focus?	What is the key understanding – Why is it important for my students right now?	Driving question	Focus tasks for assessment <i>Understanding and skills</i>
<p>Citizenship.</p> <p>Social Sciences: Social Studies: Place and Environment: Place (how people perceive, represent, interpret and interact with places)</p> <p>In the context of keeping safe around the electrified rail network.</p>	<p>When you are a citizen you belong, you matter and you make a difference.</p> <p>Citizens work together to keep everyone safe around the electrified rail network.</p>	<p>What is worth knowing and doing as a citizen around places on the electrified rail network?</p> <p><b>Stay away from overhead wires carrying electrical energy.</b>  <i>The electrical energy that moves trains is always dangerous and always on.</i>  <i>You cannot hear, see or smell electrical energy.</i>  <i>The electrical energy is 100 times more powerful than the electrical energy used at home.</i>  <i>The electrical energy can jump gaps of up to 3 metres.</i>  <i>When electrical energy passes through people, it kills or seriously injures them.</i></p> <p><b>Always use level crossings to get across the tracks.</b>  <i>Trains on the tracks are very big, very fast and very quiet.</i>  <i>Trains take a long time to stop.</i>  <i>It is dangerous to take shortcuts and trespass.</i></p> <p><b>Watch out for the second train.</b>  <i>Obey all warning signs and signals.</i>  <i>Wait until all warning signs have</i></p>	<p>1. <b>Describe</b> a place on the electrified rail network. [multistructural]</p> <p>2. <b>Explain why</b> this place on the electrified rail network is useful to citizens. [relational]</p> <p>3. <b>Take action</b> to help keep citizens in your community safe around places on the electrified rail network. [extended abstract]</p>

		<i>stopped before crossing – there may be a second train. Look and listen in both directions.</i>	
Learning area Essence statement:	Links to other learning areas:	NZC Values	NZC Key Competencies
<b>Social Sciences</b> <i>In the social sciences, students explore how societies work and how they themselves can participate and take action as critical, informed, and responsible citizens.</i>	All learning areas	Excellence Innovation, inquiry, and curiosity Diversity Equity <b>Community and participation</b> Ecological sustainability Integrity Respect	<b>Thinking</b> – Critically analyse the factors contributing to safe electrified rail networks for all citizens. <b>Managing self</b> – Act responsibly when around the electrified rail network as a pedestrian, passenger, cyclist or driver to ensure all citizens keep safe. <b>Participating and contributing</b> – Display an awareness of the local issues around creating and maintaining safe electrified rail networks. Be actively involved in community issues around safe electrified rail networks. <b>Relating to others</b> – Interact with others to create safe electrified rail networks. <b>Making meaning from language, symbols and text</b> – Interpret and use language, symbols and text in ways that keep citizens safe around electrified rail networks.
Strand	Achievement objectives <i>Select the achievement objectives that best match the NZTA focus – concept and context – for your students</i>	<b>Suggested learning intentions</b> <i>(SOLO verbs – e.g. Define, Describe, Sequence, Classify, Compare/Contrast, Explain, Analogy, Analyse, Generalise, Predict, Evaluate, Create)</i>  Use constructive alignment to design SOLO differentiated learning intentions (intended learning outcomes) to match the unit's content. <a href="http://pamhook.com/solo-apps/learning-intention-generator/">http://pamhook.com/solo-apps/learning-intention-generator/</a>	

<p><b>Place and Environment</b>  <i>Students learn about how people perceive, represent, interpret, and interact with places and environments. They come to understand the relationships that exist between people and the environment.</i></p>	<p><b>Social Studies</b>  <b>Level One</b>  <i>- Understand how places in New Zealand are significant for individuals and groups.</i>  <b>Level Two</b>  <i>- Understand how places influence people and people influence places.</i>  <b>Level Three</b>  <i>- Understand how people view and use places differently.</i>  <b>Level Four</b>  <i>- Understand how exploration and innovation create opportunities and challenges for people, places, and environments.</i></p>	<p><b>Bringing in ideas – SOLO multistructural learning intentions</b>  <b>Define</b> place.  <b>Define</b> environment.  <b>Define</b> exploration.  <b>Define</b> innovation.  <b>Define</b> opportunity.  <b>Define</b> migration  <b>Identify</b> a place/environment on the rail network that you care about.  <b>Identify</b> a place/environment on the rail network that is useful to you.  <b>Identify</b> a place/environment on the rail network that challenges you.  <b>Describe</b> a place on the rail network in your local area.  <b>Describe</b> a place on the rail network that you care about.  <b>Describe</b> the usefulness of a place on the rail network.  <b>Describe</b> the challenges related to a place on the rail network.  <b>Describe</b> the discovery of a place on the rail network.  <b>Describe</b> an explorer of a place on the rail network.  <b>Describe</b> an innovative developer of a place on the rail network.  <b>Describe</b> the development of a place on the rail network.  <b>Describe</b> the movement of people to a place on the rail network since its discovery.  <b>Describe</b> the people who use a place on the rail network now and/or who used it in the past.  <b>Describe</b> how people use a place on the rail network.  <b>Describe</b> the challenges involved in exploring a place on the rail network.  <b>Describe</b> the opportunities for innovative development of a place on the rail network  <b>Describe</b> a place/environment on the rail network that creates opportunities for people.  <b>Describe</b> a place on the rail network that challenges people.  <b>Describe</b> the different perspectives people hold about a place on</p>
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		<p>the rail network.</p> <p><b><u>Connecting ideas – SOLO relational learning intentions</u></b></p> <p><b>Classify</b> places/environments on the rail network.</p> <p><b>Classify</b> the different people connected to a place on the rail network – e.g. explorers, innovators, settlers.</p> <p><b>Classify</b> the ways people use a place on the rail network.</p> <p><b>Classify</b> the different uses of a place on the rail network since its discovery.</p> <p><b>Classify</b> challenges created by exploration of and innovation on the rail network.</p> <p><b>Classify</b> opportunities created by exploration of and innovation on the rail network.</p> <p><b>Explain</b> why a place on the rail network is useful to you.</p> <p><b>Explain</b> why people came to a place on the rail network. <b>Explain</b> why a place on the rail network was useful to others in the past.</p> <p><b>Explain</b> why people hold different perspectives about a place on the rail network.</p> <p><b>Explain</b> why a place on the rail network provides opportunities.</p> <p><b>Explain</b> why a place on the rail network provides challenges.</p> <p><b>Explain</b> how people influenced a place on the rail network in the past.</p> <p><b>Explain</b> how people influence a place on the rail network in the present.</p> <p><b>Explain</b> how the discovery of and subsequent changes to a place on the rail network provide opportunities for people.</p> <p><b>Explain</b> how the discovery of and subsequent changes to a place on the rail network provide challenges for people.</p> <p><b>Explain</b> how a place on the rail network influences people.</p> <p><b>Sequence</b> the arrival of people to a place on the rail network.</p> <p><b>Sequence</b> changes in the way people have used a place on the rail network over different timeframes – at different hours, on different days, in different months and/or over different years.</p> <p><b>Sequence</b> the different ways in which people have used a place on</p>
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		<p>the rail network since its discovery.</p> <p><b>Sequence</b> the changes in a place on the rail network since its discovery.</p> <p><b>Sequence</b> the different ways in which people have viewed a place on the rail network over time.</p> <p><b>Compare and contrast</b> how different people view and use a place on the rail network.</p> <p><b>Compare and contrast</b> the explorers of a place on the rail network with the innovators who have since developed that place.</p> <p><b>Compare and contrast</b> the uses of a place on the rail network in the past with its present uses.</p> <p><b>Compare and contrast</b> the significance of a place on the rail network to different people.</p> <p><b>Compare and contrast</b> the challenges involved in exploring a place on the rail network with the challenges involved in developing it.</p> <p><b>Compare and contrast</b> the opportunities provided by exploring a place on the rail network with the opportunities provided by developing it.</p> <p><b>Compare and contrast</b> the challenges related to a place on the rail network with the opportunities related to it.</p> <p><b>Analyse</b> a place on the rail network.</p> <p><b>Analyse</b> the rail network.</p> <p><b><u>Extending ideas – SOLO extended abstract learning intentions</u></b></p> <p><b>Predict</b> how different people might view and use a place on the rail network in the future.</p> <p><b>Predict</b> the future challenges and opportunities for a place on the rail network.</p> <p><b>Predict</b> the challenges and opportunities a place on the rail network might provide for people, places and environments in the future.</p> <p><b>Evaluate</b> different points of view about exploration of a place on the rail network.</p> <p><b>Evaluate</b> different points of view about innovative development of</p>
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		<p>a place on the rail network.</p> <p><b>Generalise</b> about the significance of places on the rail network to people in the local community.</p> <p><b>Evaluate</b> how people use a place on the rail network from the perspective of different groups.</p> <p><b>Evaluate</b> how people use a place on the rail network.</p> <p><b>Create</b> a resource that helps keep citizens safe in one or more places on the rail network.</p> <p><b>Generalise</b> about the way people view and use places on the rail network.</p> <p><b>Generalise</b> about the challenges and opportunities provided by exploration and innovative development of places on the rail network.</p>
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### Learning activities/learning experiences

*Build learning activities and experiences for SOLO differentiated learning intentions.*

*Choose learning intentions that match your students' prior learning, interests and abilities.*

**Social Sciences: Social Studies: Place and Environment: Place (how people perceive, represent, interpret and interact with places).**

**Think like a social scientist about places on the rail network.**

*Over time "spaces" change into "places".*

*At first only the point of entry is recognised; beyond lies space. In time more and more landmarks are identified and the subject gains confidence in movement. Finally the space consists of familiar landmarks and paths – in other words, place. From Yi-Fu Tuan (1977) Space and Place, p.71*

**How can we take action to keep citizens safe when they interact with places on the electrified rail network?**

### Determining prior knowledge, identifying misconceptions

Ask students to:

- Pause – clear your mind and then think deeply about the electrified rail network.
- Discuss the following question prompts in turn.
  - **Have you** or anyone you know been to a place on the electrified rail network (terminal facilities, rail yards, railway stations, the tracks, level crossings, pedestrian overbridges, trains etc.)?
  - **What was it like?**
  - **What are** the dangerous things you know to watch out for when you go to a place on the electrified rail network?
  - **What have you done** around the electrified rail network that could be dangerous?
  - **Why do you think** you behaved dangerously?
  - **What have you seen** other people do around the electrified rail network that could be dangerous?
  - **Why do you think** people behave in potentially dangerous ways around the electrified rail network?
  - **How do you feel** when you see people behaving in potentially dangerous ways around the electrified rail network?
  - **What do you do** when you see people behaving in potentially dangerous ways around the electrified rail network?
  - **What do kids need to know** about keeping safe around the electrified rail network?
  - **What do grownups need to know** about keeping safe around the electrified rail network?
- Record (write or draw) your answers to each question on separate Post-it notes.
- Label each Post-it note with the date.
- At the end of the discussion on each question, stick your answer onto a large piece of newsprint labelled with the question prompt.
- Repeat this process with each question prompt.

Keep a record of the prior knowledge of your class.

## SECTION 1: What is worth knowing and doing as a citizen around places on the electrified rail network?

### Bringing in ideas

These activities provide opportunities for students to bring in ideas about energy and energy transfer in the context of citizens using the electrified rail network.

**Learning intention: Describe a place on the electrified rail network. [multistructural]**

Differentiated success criteria: We will know we have achieved this because ...

<i>Multistructural</i>	<i>My description has several relevant ideas about a place on the electrified rail network</i>
<i>Relational</i>	<i>.... and explains why these ideas are relevant</i>
<i>Extended abstract</i>	<i>... and makes a generalisation about the place on the electrified rail network.</i>

### Key Competency self-assessment rubric<sup>1</sup> Highlight the relevant Key Competencies for section 1.

Thinking	Managing self	Participating and contributing	Relating to others	Using language, symbols and text
<p>Critically analyse the factors contributing to safe electrified rail networks for all citizens.</p> <p><i>Example – describe, explain and justify ways to stay safe at places on the electrified rail network.</i></p>	<p>Act responsibly when around the electrified rail network as a pedestrian, passenger, cyclist or driver to ensure all citizens keep safe.</p> <p><i>Example – adopt a “sort it and report it” approach to unsafe behaviour around the electrified rail network.</i></p>	<p>Display an awareness of the local issues around creating and maintaining safe electrified rail networks.</p> <p>Be actively involved in community issues around safe electrified rail networks.</p> <p><i>Example – listen, respond and act together to make the electrified rail network a system free of death and serious injury.</i></p>	<p>Interact with others to create safe electrified rail networks.</p> <p><i>Example – demonstrate a commitment to safer outcomes for self, friends, family and whānau at places on the electrified rail network.</i></p>	<p>Interpret and use language, symbols and text in ways that keep citizens safe around electrified rail networks.</p> <p><i>Example – share safe rules and behaviours for places on the electrified rail network.</i></p>

<sup>1</sup> For draft versions of these Key Competency self-assessment rubrics, see the appendix.



### 1.0. Think like a social scientist about the electrified rail network

How can we take action to keep citizens safe when they interact with places on the electrified rail network?

**Background: The rail network is a place where citizens interact – with each other and with the rail network.**

The electrified rail network is an example of an infrastructure that both supports and challenges citizens and society.

The rail network comprises physical assets (terminal facilities, rail yards, railway stations, the tracks and overhead wires and masts, level crossings, pedestrian overbridges, substations, tunnels and bridges, signalling and communications systems), administrative processes and regulations, and personnel and management required to repair tracks, sell tickets, schedule trains etc. Together these components provide a network for the mass distribution and redistribution of people, commodities and services that help shape both people and places for better and for worse.

The electrified rail station is accessible to everyone. It is a shared public space much like the roads, parks, airports, parking lots and shopping malls. You do need to have money for a ticket to board the train, but you do not have to pay a membership fee to go into the station: citizens, tourists and the homeless can use it. The station is designed so that everyone has access. For example, the physical layout of the station on the new Auckland electrified rail network is designed to be accessible to people who: are elderly, are visually impaired, have limited mobility, travel with strollers, are in wheelchairs or use guide dogs. This shared public space presents challenges for some citizens. Signs and public announcements may provide barriers to people who struggle to make meaning because of physical or cognitive impairments or because they are unfamiliar with the languages used at the station. Others may feel excluded from the public space because they do not trust station security and/or are afraid of being physically harmed by others at the station.

Because of the special hazards that are a feature of any place where high-voltage electrical energy is being transferred, everyone in that place must care about and look out for each other. Although the rail network is a space that is accessible to everyone, it is not a community public space where people come to be together; rather, it is a space where people pass through. “Passing through places” offers anonymity – you may be surrounded by other people but you can feel very alone. Travel involves transitioning between places where we belong. This makes it harder to foster a sense of belonging on the rail network – harder to develop a shared concern for the well-being of other citizens in what can be a dangerous and unforgiving environment.

The electrified rail network benefits some people and places, dis-benefits others and leaves some unaffected. For example, cities spread and satellite towns develop when people can commute to work from the outer suburbs. The amount of high-density housing, commercial buildings, convenience stores and car parking lots increases in the streets immediately around railway stations. This in turn contributes to areas of population growth, traffic congestion and streets with high pedestrian traffic around the station. When park and ride areas are supplied, rail stations can further encourage urban sprawl. However, the structures on the rail network enable innovation and change. For example, new business operations become possible when freight and raw materials can be moved quickly and efficiently between ports, airports and points of manufacture.

**What is worth knowing and doing as a citizen and a social scientist around places on the electrified rail network?**

- **Stay away from overhead wires carrying electrical energy.**
  - *The electrical energy that moves trains is always dangerous and always on.*
  - *You cannot hear, see or smell electrical energy.*
  - *The electrical energy is 100 times more powerful than the electrical energy used at home.*
  - *The electrical energy can jump gaps of up to 3 metres.*
  - *When electrical energy passes through people, it kills or seriously injures them.*
- **Always use level crossings to get across the tracks.**
  - *Trains on the tracks are very big, very fast and very quiet.*
  - *Trains take a long time to stop.*
  - *It is dangerous to take shortcuts and trespass.*
- **Watch out for the second train.**
  - *Obey all warning signs and signals.*
  - *Wait until all warning signs have stopped before crossing – there may be a second train.*
  - *Look and listen in both directions.*

### 1.1. What is the rail network?

#### Background: The New Zealand rail network

The New Zealand rail network is owned and managed by KiwiRail <http://www.kiwirail.co.nz/> The network is focused on moving freight and has limited passenger services. It consists of four main lines, seven secondary lines and many branch lines and covers over 4,000km of track in the North and South islands. The electrified sections of the rail networks are located in Wellington, between Hamilton and Palmerston North, and in Auckland.

The electrified rail network uses electrical energy to make trains move.

The newly built trains (or electric multiple units, EMUs) on the Auckland electrified rail network use electrical energy to move. The trains use this electrical energy to carry up to 375 passengers along with their bicycles, pushchairs, wheelchairs, guide dogs and luggage at speeds of 110km/h. To transport 375 passengers in another way, you would need approximately 8 buses or up to 375 cars and they would have to travel much more slowly.

The electrified rail network has many advantages over the old diesel-powered network. It offers a faster, more environmentally friendly way for people to get around the city. The new train service is faster because the new trains powered by electrical energy can accelerate (and decelerate) twice as fast as the older diesel-powered trains. The new electric trains are also more energy efficient and quieter and make no air pollution.

Citizens interact with the electrified rail network all the time: when waiting at the station platform for a train to arrive or depart; when traveling as passengers on trains using the rail network; and when crossing the rail network at level crossings or overbridges as pedestrians or cyclists or in cars.

The electrified rail network has hazards as well as advantages. Electrical hazards include shock hazards, arcing hazards, blast hazards and possible electromagnetic field hazards from the high voltage used to transfer energy to the train. The electricity is never switched off so these hazards are always present on and around the rail network. You don't need to touch an electrified source to be electrocuted – high-voltage electricity can jump from one conductor to another. The electric wires over the track carry 25,000 volts, which is 100 times more powerful than the electrical energy used in homes. The electrical energy in the wires can jump a distance of 3 metres from the wires. Any activity that brings you or objects you are

holding (like a kite) close to the live wires is highly dangerous. Even if the shock doesn't kill you, you will suffer horrible burns and injuries that will affect you for the rest of your life.

Other hazards are associated with the way trains move on the rail network. Heavy trains move along the track at high speeds (110km/h). They cannot swerve or stop quickly to avoid you. Adding to the danger, the electric trains move very quietly; you cannot hear them coming.

Because they are travelling at high speed, trains need a long distance to stop. By the time a driver sees someone on the tracks, the train cannot stop soon enough to avoid hitting them.

The high speed makes it hard for people to predict how far away the train is so they can make the wrong decision about when it is safe to cross. A train travelling at 110km/h takes only 5 seconds to travel 150m. Never try to "beat the train".

Trains can travel in any direction, on any line, at any time. You can never be sure where the next train is coming from or which track it is using. Even when you are certain the first train has passed, you can be hit by the second train travelling at high speeds on the other track.

The high speeds also create turbulence. If you are standing too close to the tracks or the edge of the platform, you can be dragged under the train.

A train track on the electrified rail network is like a corridor overstuffed with dangers you cannot see, hear or control. For all these reasons crossing the tracks as a pedestrian or cyclist or in a car will always be highly dangerous. The only safe way to get from one side of the tracks to the other is to use a railway overbridge, footbridge or level crossing.

There are many other safety systems and structures built into the rail corridor to keep people safe while they use trains. You can see these systems and structures at stations, on platforms and on trains and tracks.

Visit and/or watch YouTube videos of places on the New Zealand rail network.

For example:

KiwiRail Scenic video channel: <http://www.youtube.com/user/KiwiRailScenic>

KiwiRail Freight TVC 2013: <http://youtu.be/W3fiCS2zTFc>

KiwiRail Scenic Journeys: Take a Break. Take a Train: <http://youtu.be/CORPm2QFdQ4>

Auckland Transport: Auckland's New Electric Trains playlist:

[http://www.youtube.com/watch?v=484\\_FfGGBZg&list=PL442F15A82428642A](http://www.youtube.com/watch?v=484_FfGGBZg&list=PL442F15A82428642A)

TNZ Videos: KiwiRail Freight and Passenger Action:

<http://www.youtube.com/playlist?list=PLgREeRssJeWQXriO8qKPCTZIKrBENhiMV>

Network Rail: Introduction to Level Crossings: <http://youtu.be/G7hylkqyp9k>

DC 4352 with the Overlander (level crossing): <http://youtu.be/P84rf87-SKQ>

Train 126 @ Kaukapakapa (level crossing): <http://youtu.be/sYgQYy301AQ>

Trains around Auckland (five-barrier arm level crossing): <http://youtu.be/cPCo1-qyfVk>

Northbound Overlander on the Raurimu Spiral (tunnel): <http://youtu.be/UhL8MsyPcgM>

Newmarket Railway Station: <http://youtu.be/gRQ8Lbrha2g>

Helensville Freights (station): <http://youtu.be/7EgOq823ITU>

Overlander Departing Britomart (station): <http://youtu.be/NTvh1ihNeCO>

Station: Trains around Auckland (station): <http://youtu.be/cPCo1-qyfVk>

Northern Explorer Speeding through Taumarunui (masts): <http://youtu.be/aWclHLtTLFQ>

Ask your students:

- Think about a particular place on New Zealand's electrified rail network – a rail yard, station, an overbridge or a level crossing.
- Imagine yourself in that place.
- Ask yourself: Where am I? Where is here? How did I get here? What is this place? Think about the history, geography, and the local, national and global perspectives of this place. How did this space become a place? Who discovered this place? How was it explored? Who lobbied for this place? Who argued against this place? Who can come to this place? Who is responsible for this place? Who came to this place in the past? Why did they come? Who comes to this place now? Why do they come? What is the future of this place?

Ask students to imagine the rail network could answer questions. What questions would they like to ask it? What questions do they have in particular for the station, the tracks, the overbridge, the pedestrian walkway, the level crossing, the railway yards, the park and ride areas?

Write these “what we know we don't know” questions on Post it notes and display them on the classroom walls. Encourage students to add to them as they progress through the unit. Add a few of your own questions and invite any visitors to the class to add some as well.

## 1.2. Define terms

### 1.2.1. Define place (What is place?)

Define “place”. To help find out what a word means, you can use Google's define feature. For example, type “define: place” into the search box and press Enter. Use images of places in the local area and visit places in the school grounds. Ask students to talk about places that are special to them. Co-construct a class definition for “place” – e.g. “We think place is ...”. Include reasons and examples in the class definition.

### 1.2.2. Define environment (What is environment?)

Define “environment”. To help find out what a word means, you can use Google's define feature. Ask students to talk about environments that are special to them. Co-construct a class definition for “environment” – e.g. “We think environment is ...”. Include reasons and examples in the class definition.

**Extension:** Use Google Maps to explore the environment around a local rail station, level crossing or tracks. Use screen capture to collect images of these environments. Visit the environment and take video or images to share with the class. Use the images to write a description of environments around the local rail network.

### 1.2.3. Define rail network (What is the rail network?)

Discuss networks with students. Demonstrate how a network is a group of interconnected people, places and/or things.

Watch commoncraft's video, Social Networking in Plain English, on YouTube:

[http://youtu.be/6a\\_KF7TYKVC](http://youtu.be/6a_KF7TYKVC)

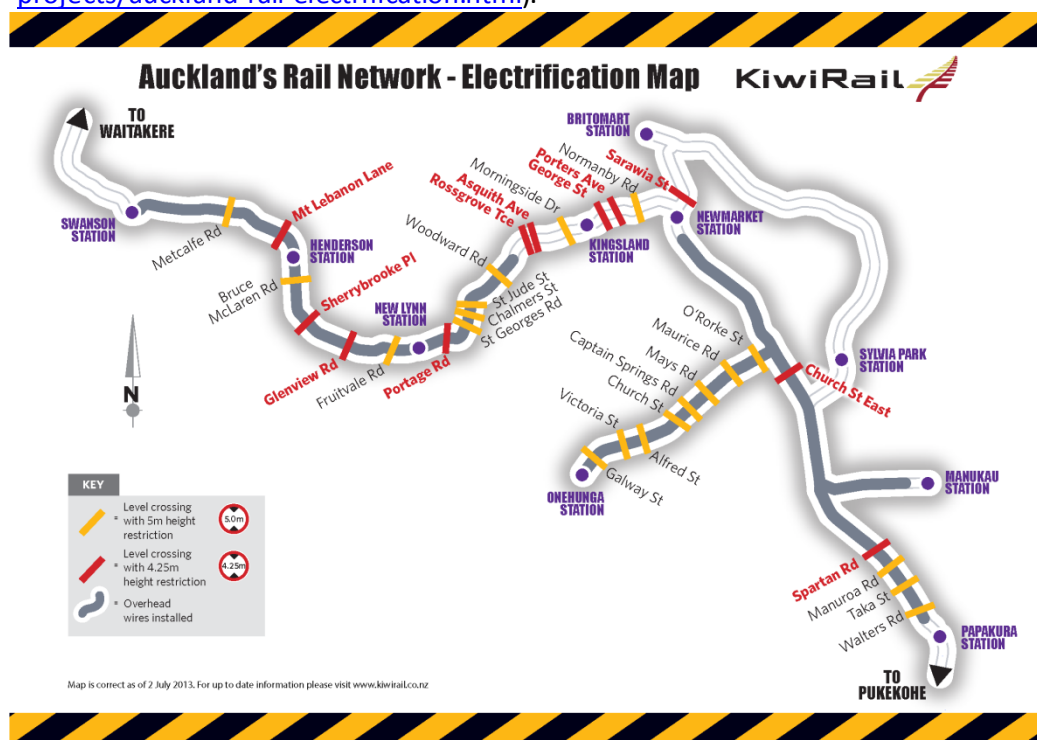
Create network grids of groups within the class, classes within the junior school, places to play in the playground, pathways that connect places in the school grounds. Use grids, meshes and webs to show how different people, places and things can be connected.

Locate your local rail network. Look at Google maps of your local railway station, and locate railway yards, railway tracks, railway bridges and pedestrian level crossings. Follow the tracks to see where the tracks come from, and where they go. Where are the stations that connect to the local station? Walk around part of your local rail network that has public access, taking photos of the different places and structures linked to the network.

Write a shared class definition of rail network –for example, “We think the rail network is (make a claim) because (insert a reason) because (provide evidence and examples).”

**Extension:** Model or map your local network using photos and drawings of different places and people from your local or national rail network –railway station, railway yards, railway tracks, railway bridges or pedestrian level crossings. You can include different items from model train sets. Ask students to make connections between the images and/or items and to explain why they think they are connected.

Ask students to draw a map of the local rail network based on their ideas. For example, see the KiwiRail Auckland Electrification Map below (from <http://www.kiwirail.co.nz/projects/major-projects/auckland-rail-electrification.html>).



Co-construct a class definition for “rail network” –e.g. “We think the rail network is ...”. Include reasons and examples in the class definition. Revisit your rail network diagram and definition as students deepen their understanding throughout the unit.

#### 1.2.4. Define exploration (What is exploration?)

Define “exploration”. To help find out what a word means, you can use Google’s define feature. Use images of exploration in the local area and visit places in the school grounds. Co-construct a class definition for “exploration” –e.g. “We think exploration is ...”. Include reasons and examples in the class definition.

**Extension:** Ask students to think about exploration in the context of the rail network. Read Te Ara: Building the Rail Network: <http://www.teara.govt.nz/en/railways/page-1> Describe how early railway tracks in New Zealand helped people explore the country.

### 1.2.5. Define innovation (What is innovation?)

Define “innovation”. To help find out what a word means, you can use Google’s define feature. Use images of innovation in the local area and visit places of innovative practice.

Help students distinguish between innovation and invention. Innovation is doing something different – the use of a new idea or method to develop more effective or different products or processes etc. Innovation is not simply doing the same thing better (improvement) or creating a new idea or approach (invention).

Co-construct a class definition for “innovation” – e.g. “We think innovation is ...”. Include reasons and examples in the class definition.

**Extension:** Ask students to think about innovation in the context of the rail network. For example, new business operations become possible when freight and raw materials can be moved quickly and efficiently between ports, airports and points of manufacture. Innovation may also relate to new developments in the rail network with respect to the track (materials, installation, monitoring, maintenance, design and performance); trains and their operation; or signalling, communications and information management.

Refer to:

Crosscountry Trains: Ten Minute Reservations: <http://www.crosscountrytrains.co.uk/travel-tools/ten-minute-reservations>

Ouigo: SCNF Launches More Low-cost Train Service: <http://transitized.com/2013/02/19/ouigo-sncf-launches-more-low-cost-train-service/>

### 1.3. Identify a place/environment on the rail network that you care about, is useful to you or influences or challenges you

Photograph, video and draw this place on the rail network. Locate it on a map of the local area. Make a Google map showing the place in the rail network. Arrange a supervised visit to this place on the rail network in your local area. Use Google Maps to look at the environment around the station (and the tracks). Find places that are advantaged by connections across the rail network and places where there is no rail connection at all.

**Extension:** Talk to members of your local community about the rail network. Identify the places they care about, use, or are influenced and/or challenged by.

#### 1.3.1. Describe a place/environment on the rail network that you care about, is useful to you or influences or challenges you

Use photographs, video, sketches, Google Maps and face-to-face visits to describe the attributes/characteristics of a place on the rail network e.g. platform, station, tracks, rail yards, level crossing. Use the senses to consider: What does it look like, feel like, sound like and smell like? How does it influence who I am and what I do?

For example, a railway station is made up of:

- a platform with signage and the yellow line
- a station building, including ticket sales, waiting rooms and toilets

- communication systems (safety and arrival/departure information) – loudspeakers, signage, signals
- pedestrian and wheelchair access ramps, overbridges, steps
- luggage carts
- a drop-off and collect parking area
- a left luggage area
- a lost and found office
- taxi ranks
- bus bays.

Identify features that you care about, features that are useful and features that are hazardous and need to be managed if you are to be safe on the rail network. Identify any features of the place designed to keep people safe.

For example, the following KiwiRail websites describe features that are hazardous in the electrified rail network and how to manage them.

Live Wire: <http://youtu.be/2TQ6QCs4rgo>

Staying Safe around the Electrified Rail Network: <http://www.kiwirail.co.nz/projects/major-projects/auckland-rail-electrification/auckland-electrification-safety/staying-safe.html>

Level Crossings: <http://www.kiwirail.co.nz/projects/major-projects/auckland-rail-electrification/auckland-electrification-safety/level-crossings.html>

If You Live Next to the Rail Tracks: <http://www.kiwirail.co.nz/projects/major-projects/auckland-rail-electrification/auckland-electrification-safety/living-next-door.html>

**Extension:** Explain how a place on the rail network in your local area influences you and your life. Explain why this place is worth visiting and what you have to do to keep safe around this place. Draw a picture and write a description of the place on the rail network that you care about, is useful to you or challenges you. Use the HookED Describe ++ (see think wonder) map and self-assessment rubric to draft student writing.

Ask students to work in groups of two to three and describe one or more places on the rail network:

- Draw the place (or insert a photograph) in the centre of the HookED Describe++ map.
- In the rectangles, describe the place. What does it look like? What can you see there?
- In the speech bubbles, explain why each of these features or characteristics makes the place useful to people.
- In the thought bubble, create one or more wonder questions for the place – I wonder what would happen if ...?

### 1.3.2. Describe what a place/environment on the rail network was like in the past

Invite a local historian, long-time resident, and town planner to share stories about the ways people discovered and developed a place on the electrified rail network. Search for past images and video of this place and descriptions of how it was used. Describe a place on the rail network in terms of its earliest discovery. Locate resources that describe the early explorers of this place. Map the explorers' journey before and after they discovered it.

**Extension:** Describe this place in terms of its development. Include descriptions of the early developers of this place. Finally research the use of the place over time to the present. Include



descriptions of the different people who have used this place since its development. How did this place influence people in the past?

Ask students to work in groups of two to three and describe a place on the rail network in the past:

- Insert a photograph of the place, showing what it was like in the past, in the centre of the HookED Describe ++ (see think wonder) map.
- In the rectangles, describe the place as it was in the past. What did it look like? What could you see there?
- In the speech bubbles, explain why each these features or characteristics made the place useful to people.
- In the thought bubble, create one or more wonder questions for the place – I wonder what would have happened if ...?

Refer to:

- Archives NZ: Railways of the Pacific Wonderland – Celebrating 150 Years on NZ Railways: [http://www.youtube.com/watch?v=yQv7P4VA4mI&list=PLFjRz3quvmyAS\\_dImagdtPXaXg-N9v3DP&feature=share](http://www.youtube.com/watch?v=yQv7P4VA4mI&list=PLFjRz3quvmyAS_dImagdtPXaXg-N9v3DP&feature=share)
- Use Matapihi [www.matapihi.org.nz/](http://www.matapihi.org.nz/) to search for images online. For example, a search for Newmarket Railway Station pulled up images from the 1920s, 1970s and 1990s.

Other useful New Zealand sites include:

- DigitalNZ: <http://www.digitalnz.org/>
- Local History Online: <http://www.localhistoryonline.org.nz/cgi-bin/PUJ>
- National Library of New Zealand: Publications (NZ): <http://publicationsnz.natlib.govt.nz/>
- Te Ara: <http://www.teara.govt.nz/>
- New Zealand History: <http://www.nzhistory.net.nz/>
- New Zealand Electronic Text Collection: <http://nzetc.victoria.ac.nz/>
- The Film Archive: <http://www.filmarchive.org.nz/>
- TVNZ On Demand: <http://tvnz.co.nz/video>
- National Library of New Zealand: Time Frames: <http://timeframes.natlib.govt.nz/>
- New Zealand Historic Places Trust: <http://www.historic.org.nz/>
- New Zealand by Rail: <http://www.railnewzealand.com/>

### 1.3.3. Describe how people have influenced the rail network

Identify a place on the rail network and find out how people have changed this place over time. Look for examples of how people have tried and are trying to influence the rail network in the past and in the present. For example, research one of the regional railway lines currently under threat of closure or follow the history of the development of the electrified rail network in Auckland. Identify the different lobby groups involved and describe how (and explain why) people want to influence the regional rail network or Auckland's rail transport network.

**Extension:** Describe how people influenced the development of the rail network in the past.

Refer to:

Te Ara: Biographies: <http://www.teara.govt.nz/en/browse/page/biographies>

Te Ara: Railways: <http://www.teara.govt.nz/en/railways>

Te Ara: Bridges and Tunnels: <http://www.teara.govt.nz/en/bridges-and-tunnels>



Rail Transport in New Zealand: [http://en.wikipedia.org/wiki/Rail\\_transport\\_in\\_New\\_Zealand](http://en.wikipedia.org/wiki/Rail_transport_in_New_Zealand)

Wikipedia: North Auckland Line: [http://en.wikipedia.org/wiki/North\\_Auckland\\_Line](http://en.wikipedia.org/wiki/North_Auckland_Line)

Wikipedia: Stratford–Okahukura Line:

[http://en.wikipedia.org/wiki/Stratford%E2%80%93Okahukura\\_Line](http://en.wikipedia.org/wiki/Stratford%E2%80%93Okahukura_Line)

Wikipedia: Wairarapa Line: [http://en.wikipedia.org/wiki/Wairarapa\\_Line](http://en.wikipedia.org/wiki/Wairarapa_Line)

Wikipedia: Palmerston North–Gisborne Line: [http://en.wikipedia.org/wiki/Palmerston\\_North\\_-\\_Gisborne\\_Line](http://en.wikipedia.org/wiki/Palmerston_North_-_Gisborne_Line)

NZ Herald: KiwiRail on Track after a Hard Year:

[http://www.nzherald.co.nz/business/news/article.cfm?c\\_id=3&objectid=11117328](http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11117328)

Wikipedia: Public Transport in Auckland: [http://en.wikipedia.org/wiki/Public\\_transport\\_in\\_Auckland](http://en.wikipedia.org/wiki/Public_transport_in_Auckland)

Wikipedia: Auckland Railway Electrification:

[http://en.wikipedia.org/wiki/Auckland\\_railway\\_electrification](http://en.wikipedia.org/wiki/Auckland_railway_electrification)

Auckland Transport: Electric Trains for Auckland: <http://www.aucklandtransport.govt.nz/improving-transport/auckland-rail-upgrade/electric-trains/Pages/default.aspx>

Johnsonville Railway: Raroa Intermediate:

<http://www.livingheritage.org.nz/schools/intermediate/raroa/johnsonville/index.php>

#### **1.3.4. Describe the rail network (What is the rail network like?)**

Describe the physical attributes of the rail network. Describe the administrative processes and regulations of the rail network. Describe the personnel and management of the rail network. Describe the people and freight being moved by the rail network. What are they like? For example, you can include some or all of the following in your description:

- physical assets –
  - terminal facilities
  - rail yards
  - railway stations
  - tracks
  - overhead wires and masts
  - rail substations
  - level crossings
  - overbridges and pedestrian walk ways
  - tunnels
  - bridges
  - signalling systems
  - communication systems
- administrative processes and regulations
- personnel and management required to repair tracks, sell tickets, schedule trains etc.

**Extension:** Explain why these elements are important to the rail network.

#### **1.4. Invite members of the local community to share stories, images and artefacts about places on the local rail network**

For example, collect stories about this place from diverse others in the local community.

Invite a local historian and/or long-time resident to share stories, images and artefacts about this local place on the rail network from the past.

Invite a town planner to share present-day stories about a place on the local rail network.

Invite a train enthusiast to share stories about a place on the local rail network.

Invite commuters to share stories about a place on the local rail network.

Invite a rail network employee to share stories about a place on the local rail network.

Invite a member of the police force to share stories about a place on the local rail network.

Invite someone whose home backs onto the rail network to share stories about a place on the local rail network.

Invite a person with limited mobility to share stories about the accessibility of a place on the local rail network.

Invite a person who uses the local rail network with pre-schoolers to share stories about a place on this network.

Invite local teenagers to share stories about a place on the local rail network.

Invite an ambulance driver to share stories about a place on the local rail network.

Invite a local manufacturer, business owner, farmer or horticulturist to share stories about a place on the local rail network.

Invite a tourist to share stories about a place on the local rail network.

Prompt the invited speakers to talk about how they use the place and how they manage to keep safe at this place on the rail network.

Use video or voice recording or take notes of the stories about local places on the rail network in the past.

**Extension:** Collate and curate the stories as oral histories on a class blog or wiki so other people in the local community can contribute to the stories explaining how they use or have used a place on the rail network.

## SECTION 2: Explain what is worth knowing and doing as a citizen around places on the electrified rail network

### Relating ideas

These activities provide opportunities for students to connect ideas about place and the electrified rail network.

**Learning intention: Explain why a place on electrified rail network is useful to citizens. [relational]**

Differentiated success criteria: We will know we have achieved this because ...

<i>Multistructural</i>	<i>My explanation has several relevant reasons why this place on the electrified rail network is useful to citizens</i>
<i>Relational</i>	<i>.... and explains why these reasons are relevant</i>
<i>Extended abstract</i>	<i>... and makes a generalisation about the reasons.</i>

### Key Competency self-assessment rubric<sup>2</sup> Highlight the relevant Key Competencies for section 2.

Thinking	Managing self	Participating and contributing	Relating to others	Using language, symbols and text
<p>Critically analyse the factors contributing to safe electrified rail networks for all citizens.</p> <p><i>Example – describe, explain and justify ways to stay safe at places on the electrified rail network.</i></p>	<p>Act responsibly when around the electrified rail network as a pedestrian, passenger, cyclist or driver to ensure all citizens keep safe.</p> <p><i>Example – adopt a “sort it and report it” approach to unsafe behaviour around the electrified rail network.</i></p>	<p>Display an awareness of the local issues around creating and maintaining safe electrified rail networks.</p> <p>Be actively involved in community issues around safe electrified rail networks.</p> <p><i>Example – listen, respond and act together to make the electrified rail network a system free of death and serious injury.</i></p>	<p>Interact with others to create safe electrified rail networks.</p> <p><i>Example – demonstrate a commitment to safer outcomes for self, friends, family and whānau at places on the electrified rail network.</i></p>	<p>Interpret and use language, symbols and text in ways that keep citizens safe around electrified rail networks.</p> <p><i>Example – share safe rules and behaviours for places on the electrified rail network.</i></p>

<sup>2</sup> For draft versions of these Key Competency self-assessment rubrics, see the appendix.

### **2.1. Sequence how often a place on the rail network is used by people over time**

Track how often people interact with a place on the rail network. Track what people do at this place over a period of time – hours, days, weeks. Create a timeline or infographic showing how the number of people using the place changes over a given period of time.

**Extension:** Explain what the use patterns suggest about the importance of this place on the rail network to people in your local community.

### **2.2. Interview (or survey) people in your local community to find out the significance of this place on the rail network to different groups (Why is this place on the rail network useful?)**

Develop questions to use when interviewing people in your local community about a place on the rail network. Design your questions to find out how the person uses the place, how they keep safe around the place and their perspective of the place. How does the place influence them? How does the place make them feel? Invite people to answer your questions face to face at school, or in a place on the rail network, by email or through a Skype video call. Take photographs, and make voice or video recordings with the approval of the people being interviewed. Create a summary of the responses to share with other students.

**Extension:** Use your summary to explain why places on the rail network influence people and their lives. Identify ways in which the rail network challenges your local community and create an action group to address these challenges.

### **2.3. Compare and contrast the significance of this place on the local rail network to different groups**

Compare and contrast the relative importance of the level crossing, station or rail network to different groups in your local community. Compare and contrast the ways people use the level crossing, station or rail network. Compare and contrast how people feel at the level crossing or station or around the rail network. Compare and contrast the safety measures different people use when they are around trains and tracks. Identify similarities and differences. Explain the relevance of the similarities and differences. Make a generalisation about the overall significance of any similarities and differences.

**Extension:** Identify a group in your local community who feel unsafe around the rail network. Work with them to address their issues.

### **2.4. Explain why the electrified rail network provides opportunities and challenges to citizens**

Identify reasons why the rail network provides convenient connections for citizens in some places and no connection at all for citizens in other places. Identify reasons why the electrified rail network is seen as providing safe, efficient transport for some citizens and danger and death to others. Identify reasons why the electrified rail network contributes to urban sprawl in some places and encourages high-density, inner-city lifestyles in others. Identify reasons the electrified rail network makes work, shopping and entertainment more accessible in some places and less accessible in others. Identify reasons why living near the electrified rail network allows citizens to arrange their lives and plan their daily activities in a completely different way to citizens who live further away. Identify why certain neighbourhoods, restaurants and hotels build around rail network hubs. Use these reasons to explain why the electrified rail network provides both opportunities and challenges.

**Extension:** Explain how discovery and subsequent changes to a place have provided opportunities and challenges for people. Compare and contrast the challenges and opportunities provided by the exploration and development of a place. Debate the claim that the electrified rail network provides more opportunities for the local community than it does challenges.

## 2.5. Compare and contrast the different uses of a place on the rail network in the past with the uses in the present

Research past uses of a place on the rail network in your local community. Describe how the place was used in the past. Describe how the place is used now. Identify similarities and differences between how the place is used now and how it was used in the past. Give reasons for these similarities and differences. Make a generalisation about the overall use of the place on the rail network: "Overall I think (insert claim) because (give reason) because (provide evidence and examples)."

**Extension:** Predict how the place on the rail network will be used in 50 years.

Refer to:

Rail Transport in New Zealand: [http://en.wikipedia.org/wiki/Rail\\_transport\\_in\\_New\\_Zealand](http://en.wikipedia.org/wiki/Rail_transport_in_New_Zealand)

Wikipedia: North Auckland Line: [http://en.wikipedia.org/wiki/North\\_Auckland\\_Line](http://en.wikipedia.org/wiki/North_Auckland_Line)

Wikipedia: Stratford–Okahukura Line:

[http://en.wikipedia.org/wiki/Stratford%E2%80%93Okahukura\\_Line](http://en.wikipedia.org/wiki/Stratford%E2%80%93Okahukura_Line)

Wikipedia: Wairarapa Line: [http://en.wikipedia.org/wiki/Wairarapa\\_Line](http://en.wikipedia.org/wiki/Wairarapa_Line)

Wikipedia: Palmerston North–Gisborne Line: [http://en.wikipedia.org/wiki/Palmerston\\_North\\_-\\_Gisborne\\_Line](http://en.wikipedia.org/wiki/Palmerston_North_-_Gisborne_Line)

NZ Herald: KiwiRail on Track after a Hard Year:

[http://www.nzherald.co.nz/business/news/article.cfm?c\\_id=3&objectid=11117328](http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11117328)

Wikipedia: Public Transport in Auckland: [http://en.wikipedia.org/wiki/Public\\_transport\\_in\\_Auckland](http://en.wikipedia.org/wiki/Public_transport_in_Auckland)

Wikipedia: Auckland Railway Electrification:

[http://en.wikipedia.org/wiki/Auckland\\_railway\\_electrification](http://en.wikipedia.org/wiki/Auckland_railway_electrification)

Auckland Transport: Electric Trains for Auckland: <http://www.aucklandtransport.govt.nz/improving-transport/auckland-rail-upgrade/electric-trains/Pages/default.aspx>

Johnsonville Railway: Raroa Intermediate:

<http://www.livingheritage.org.nz/schools/intermediate/raroa/johnsonville/index.php>

## 2.6. Sequence the changes in a place on the rail network (or sequence the way people have used a place) since its discovery

List the changes in a place or ways in which it has developed since its discovery. List the changes in the way people have accessed and used a place since its discovery. Write paragraphs describing/summarising each change. Sort these changes into chronological order to create a timeline of how a place on the rail network has changed.

**Extension:** Find early maps of your local area and use them to map the changes to an identified place on the rail network since its discovery. Use annotations and images.

For example, refer to:

National Library of New Zealand: Cartographic Collection: <http://natlib.govt.nz/collections/a-z/cartographic-collection>

Matapihi: <http://matapihi.org.nz/>

1908 City of Auckland Map: <http://www.aucklandcity.govt.nz/dbtw-wpd/CityArchives/1908Map/browse1908map.htm>

Te Ara: Early Map of Auckland 1859: <http://www.teara.govt.nz/en/zoomify/8704/early-map-of-auckland>

Auckland City Library: Heritage Images (includes online maps): <http://www.aucklandcity.govt.nz/dbtw-wpd/maps/mapsfr.html>

Te Ara: Early Mapping: <http://www.teara.govt.nz/en/early-mapping>

Guide to Finding New Zealand Historical Maps:

<http://www.library.auckland.ac.nz/docs/helpsheets/FindingHistoricalMaps.pdf>

Auckland Libraries: Auckland Crown Grants:

<http://www.aucklandcitylibraries.com/DigitalLibrary/resourcepages/aucklandcrowngrants.aspx>

Hocken Library: University of Otago:

[http://www.otago.ac.nz/library/exhibitions/he\\_tirohanga\\_ki\\_muri/images.html#maps](http://www.otago.ac.nz/library/exhibitions/he_tirohanga_ki_muri/images.html#maps)

National Library of New Zealand: Collections: <http://natlib.govt.nz/collections>

ANZMapS: <http://www.anzmaps.org/>

## 2.7. Analyse a place on the rail network

Locate a place on the rail network. Identify all the relevant parts that make up this place on the rail network.

For example, a railway station is made up of:

- a platform with signage and yellow line
- a station building including ticket sales, waiting rooms and toilets
- communication systems (safety and arrival/departure information)—loudspeakers, signage, signals
- pedestrian and wheelchair access ramps, overbridges, steps
- luggage carts
- a drop-off and collect parking area
- a left luggage area
- a lost and found office
- taxi ranks
- bus bays.

Think about each element in turn. If the element was missing or malfunctioned, how would this affect the station as a whole? Use this thinking to make a generalisation about the purpose or function of the element. Step back from your analysis and make a generalisation about the relative importance of the parts to the whole place.

**Extension:** Evaluate the importance of the different parts of a railway station.

## 2.8. Analyse the rail network

Identify all the relevant parts that make up the rail network.

For example, the rail network is made up of:

- physical assets—
  - terminal facilities
  - rail yards
  - railway stations
  - tracks
  - overhead wires and masts
  - rail substations
  - level crossings
  - overbridges and pedestrian walk ways
  - tunnels
  - bridges
  - signalling systems
  - communication systems
- administrative processes and regulations
- personnel and management required to repair tracks, sell tickets, schedule trains etc.

Think about each element in turn. If the element was missing or malfunctioned, how would this affect the rail network as a whole? Use this thinking to make a generalisation about the purpose or function of the

element. Step back from your analysis and make a generalisation about the relative importance of the parts to the whole network.

**Extension:** Draw a concept map to represent all the connections (nodes and internodes) in a rail network. Evaluate the importance of the different parts of a rail network to the whole network.

### **SECTION 3: Extend your thoughts and your actions as to what is worth knowing and doing as a citizen around places on the electrified rail network**

#### **Looking in a new way**

These activities provide opportunities for students to extend their connected ideas about place and the electrified rail network.

**Learning intention: Take action to help keep citizens in your community safe around places on the electrified rail network. [extended abstract]**

Differentiated success criteria: We will know we have achieved this because ...

<i>Multistructural</i>	<i>I have created a resource to help people keep safe around places on the electrified rail network</i>
<i>Relational</i>	<i>.... and I explain how and why the ideas in the resource will help people keep safe around places on the electrified rail network</i>
<i>Extended abstract</i>	<i>... and I seek and act on feedback to improve ideas in the resource that will help people keep safe around the electrified rail network.</i>



**Key Competency self-assessment rubric<sup>3</sup>** Highlight the relevant Key Competencies for section 3.

Thinking	Managing self	Participating and contributing	Relating to others	Using language, symbols and text
<p>Critically analyse the factors contributing to safe electrified rail networks for all citizens.</p> <p><i>Example – describe, explain and justify ways to stay safe at places on the electrified rail network.</i></p>	<p>Act responsibly when around the electrified rail network as a pedestrian, passenger, cyclist or driver to ensure all citizens keep safe.</p> <p><i>Example – adopt a “sort it and report it” approach to unsafe behaviour around the electrified rail network.</i></p>	<p>Display an awareness of the local issues around creating and maintaining safe electrified rail networks.</p> <p>Be actively involved in community issues around safe electrified rail networks.</p> <p><i>Example – listen, respond and act together to make the electrified rail network a system free of death and serious injury.</i></p>	<p>Interact with others to create safe electrified rail networks.</p> <p><i>Example – demonstrate a commitment to safer outcomes for self, friends, family and whānau at places on the electrified rail network.</i></p>	<p>Interpret and use language, symbols and text in ways that keep citizens safe around electrified rail networks.</p> <p><i>Example – share safe rules and behaviours for places on the electrified rail network.</i></p>

<sup>3</sup> For draft versions of these Key Competency self-assessment rubrics, see the appendix.

### 3.1. Generalise about the electrified rail network

#### 3.1.1. Make a generalisation about the significance of the rail network to people in your local community

Ask students to reflect on all the different parts of the rail network, how they are used, who uses them and how easy it is to be safe. Make a class generalisation – “Overall we think the rail network is (make a claim) because (give reasons), and our evidence is (give examples).”

#### 3.1.2. Make a generalisation about the way people view and use rail networks in your local community

Ask students to reflect on all the different ways people use the rail network and all the different perspectives they hold. Is the rail network a community of people who care for each other or simply a collection of strangers passing through? Make a class generalisation – “Overall we think the rail network is (make a claim) because (give reasons), and our evidence is (give examples).”

#### 3.1.3. Make a generalisation about the way to keep citizens safe when they use rail networks in your local community

Ask students to reflect on all the different ways people use the rail network and all the different measures needed to keep them safe. Make a class generalisation – “Overall we think the best way to keep citizens safe on the rail network is to (make a claim) because (give reasons), and our evidence is (give examples).”

### 3.2. Predict the significance of the rail network to people in the future

Think about movement of people and freight. Think about the future – how will people and freight move from A to B? Will we need to move people and/or freight? Predict the challenges and opportunities that further exploration of the rail network might provide for people, places and environments in the future.

Is the answer “more and faster” trains? Are the enormous costs of the physical structures of the rail network – the track and station and their fixed location – a barrier to the flexibility and responsiveness needed in any future movement of freight and people? Will the efficiencies of rail (“land usage, energy consumption, the cost of moving a ton mile of whatever needs to be moved”) mean rail has a future? What will the new traveller want when moving from point a to point b? What experiences can rail provide to meet the wants and needs of future citizens? How will freight be delivered in the future? What advantages can rail offer to meet the needs and wants of business and manufacturing. Make a prediction about the future of the rail network and back it up with reasons and evidence.

Refer to:

Wikipedia: 3D Printing: [http://en.wikipedia.org/wiki/3D\\_printing](http://en.wikipedia.org/wiki/3D_printing)

Amazon Prime Air: <http://www.amazon.com/b?node=8037720011>

Amazon Drones: [http://youtu.be/F9\\_vxLNooa4](http://youtu.be/F9_vxLNooa4)

Delivery Drones Already Exist: <http://www.wired.com/business/2014/01/delivery-drones-already-exist/>

The Martin Jetpack: <http://www.martinjetpack.com/>

Wikipedia: Jet Pack: [http://en.wikipedia.org/wiki/Jet\\_pack](http://en.wikipedia.org/wiki/Jet_pack)

No Flight of Fancy, the Jet Pack is Coming – from New Zealand:

<http://online.wsj.com/news/articles/SB10001424127887323981304579078990245523348>

The Future of Rail:

<http://online.wsj.com/news/articles/SB10001424052748703834804576301230350030512>

### 3.3. Create a resource or plan an action to help keep citizens safe at one or more places on the local rail network

Imagine that you are a group of explorers who have just discovered your local community and its rail network. Use digital images, video, drawings, local history, stories, interviews, links to articles in local media, latitude and longitude etc., to bring in information about one or more places on the local rail network, detailing how the place is affecting people (keeping them safe) and how people are affecting the place (creating safeguards for use of the place).

Create an exploration report, profiling your discovery of the place and the opportunities and challenges it provides for the different groups in your local community. Explain how people can change their behaviours to be safe around the place/s on the rail network and how the place/s on the rail network have changed to accommodate people and keep them safe when they are using the electrified rail network.

**Use the opportunities and challenges of places as a context for communicating the following key messages**

- **Stay away from overhead wires carrying electrical energy.**
  - *The electrical energy that moves trains is always dangerous and always on.*
  - *You cannot hear, see or smell electrical energy.*
  - *The electrical energy is 100 times more powerful than the electrical energy used at home.*
  - *The electrical energy can jump gaps of up to 3 metres.*
  - *When electrical energy passes through people, it kills or seriously injures them.*
- **Always use level crossings to get across the tracks.**
  - *Trains on the tracks are very big, very fast and very quiet.*
  - *Trains take a long time to stop.*
  - *It is dangerous to take shortcuts and trespass.*
- **Watch out for the second train.**
  - *Obey all warning signs and signals.*
  - *Wait until all warning signs have stopped before crossing – there may be a second train.*
  - *Look and listen in both directions.*

Identify a need for safer behaviours around the rail network in your local community. Identify the group in your local community who most need help to manage their safety on the rail network. Include your recommendations for safer use of the place/s on the local rail network in the future.

Work in groups to develop your safety message targeting this group.

Brainstorm ways to communicate your message to the at-risk group using your local rail network.

Create a resource or plan an action that will communicate your message.

Plan how to communicate your safety message to people in the community who use the local rail network or to people who provide the local rail network.

Resources to communicate the message may include: advertisement, animation, art work, baking, blog, board game, brochure, cake decoration, cartoon, carving, chart, comic book, computer game, cupcakes, dance, shop window display, drama, drawing, documentary, flyer, graph, game, Google map, haiku, “how to” guide, illustrated story, infographic, jingle, kete (traditional Māori baskets), letter, logo, mask, map, mime, montage, musical performance, mural, photo essay, pamphlet, performance, pick a path, postcards, poster, poem, puppet show, radio show, rap, recipe, role play, rubric, scrapbook, slideshow, sculpture, song, speech, t-shirt, television commercial, trading cards, whakataukī, wiki, video, webpage.