

Sydney Metro Inquiry Based Unit: Stage 3

Syllabus Links













Curriculum Area	Outcomes	Skills	General capabilities and cross-curriculum priorities
Geography	<p>GE3-3: compares and contrasts influences on the management of places and environments</p> <p>GE3-2: explains interactions and connections between people, places and environments</p> <p>GE3-4: acquires, processes and communicates geographical information using geographical tools for inquiry</p>	<ul style="list-style-type: none"> • Identification of ways people influence places and contribute to sustainability eg roads and services, building development applications, local sustainability initiatives • Examination of a local planning issue; the different views about it and a possible action in response to it • Identification of factors that influence people’s perceptions of places eg media, culture, education, travel 	<p>Asia and Australia’s engagement with Asia</p> <p>Sustainability</p> <p>Literacy</p> <p>Numeracy</p>
History	<p>HT3-1: describes and explains the significance of people, groups, places and events to the development of Australia</p> <p>HT3-5: applies a variety of skills of historical inquiry and communication</p>	<ul style="list-style-type: none"> • Identify events that have shaped Australia's identity and discuss why they were significant • Outline local, state and federal government structures and responsibilities 	<p>Information and communication technology capability</p> <p>Civics and citizenship</p>
Science	<p>ST3-2DP-T: Plans and uses materials, tools and equipment to develop solutions for a need or opportunity</p> <p>ST3-3DP-T: Defines problems, and designs, modifies and follows algorithms to develop solutions</p>	<ul style="list-style-type: none"> • Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data • Investigate materials, components, tools, techniques and processes required to achieve intended design solutions 	






















Key Inquiry Question:
























How do transport networks from the past and around the world impact and shape my future with the Sydney Metro infrastructure?

Teaching, learning and Assessment

Teaching and Learning Experiences	Resources and Technology
<p>'Hook' students into learning about the Sydney Metro by informing them, that they have receive a letter from Sydney Metro. As a class – read the letter out loud and discuss.</p> <p>Provide opportunities for students to experience/engage with the following Immersion Centres/experiences:</p> <ol style="list-style-type: none"> 1. All things trains 2. What I already know about trains 3. Why do we need a station? 4. Create your own train 5. Predictions for future Sydney Metro 	<p>Letter from Sydney Metro (sample included at the end of the unit)</p> <p>As applicable in the Learning Centre experiences below</p>
<p>Provide opportunities for students to experience the following Learning Centres/experiences:</p> <ol style="list-style-type: none"> 1. Trains – Past, Present AND Future of trains! 2. Trains – Mechanics of a train – electric and steam 3. Global trains – underground and above ground train station 4. Different ways infrastructure is shaped 5. The impacts of infrastructure on the environment 	<p>As applicable in the Immersion Centre experiences below</p>

Learning Centre	Learning Experience	Student Task Card
Immersion Centre 1	<p>LI: I am learning to collaboratively explore a worldwide range of trains</p> <p>SC: I can:</p> <ul style="list-style-type: none"> • Categories a range of images of trains • Reflect on what I do and do not know about trains <p>Introduce students to the unit by exploring the Sydney Metro site (history, interactive map, gallery). Discuss with the student why they think we are learning about the Sydney Metro.</p> <p>Students to complete Immersion Centre 1: 'All things trains'</p> <p>Invite students to share what they know, then allow students to record any wonderings on a post-it note for the wonder wall.</p>	<div style="border: 2px solid #00AEEF; padding: 10px;"> <h2 style="text-align: center; color: #00AEEF;">All things trains</h2> <ol style="list-style-type: none"> 1 In watering holes  create a Venn diagram  using two hula hoops. 2 Using the images  of trains, your task is to categorise the pictures and discuss  the reasoning as to why you have put them into their groups. 3 In your workbooks,  reflect  on what you do and don't already know about trains and their impact on our society. e.g. socially  environmentally  technologically  economically  <p style="text-align: right;"></p> </div>
Immersion Centre 2	<p>LI: I am learning to work collaboratively to brainstorm what i already know about trains.</p> <p>SC: I can</p> <ul style="list-style-type: none"> • Explain the purposes of trains • Explain who uses a train and how a train is accessible • Explain how trains work and how they are looked after <p>In small groups (3-4 students), have students brainstorm what they know about trains in Australia, by considering the following questions:</p> <ul style="list-style-type: none"> • Who uses trains? • What are the purposes of trains? • Why do people travel in trains? • How does a train work? What do you know about the mechanics of a train? • Where does a train get constructed? • Who looks after trains and train stations? • How is a train accessible to different groups of people e.g. wheel chair, prams etc. 	<div style="border: 2px solid #00AEEF; padding: 10px;"> <h2 style="text-align: center; color: #00AEEF;">What I already know about trains</h2> <ol style="list-style-type: none"> 1 Look at the model of a train provided by Sydney Metro. 2 Before beginning our investigation on trains and reading through our challenge brief letter, it is important for your teachers to be aware of what you already know about trains in Australia. You task is to work in watering hole groups of 3-4 students to fill in the <u>A3 organiser</u> and brainstorm what you know about trains in Australia. 3 If you agree with an idea that a group member has placed in the chart, you can write your initials next to the idea. <p style="text-align: right;"></p> </div>

<p>Immersion Centre 3</p>	<p>LI: We are learning to build a sustainable environment through the use of public transportation</p> <p>SC: I can</p> <ul style="list-style-type: none"> • Think about our future and why it is important for us to maintain environments that we live in • Give reasons as to why I believe we need a metro station in our community <p>Students brainstorm ideas on why they think it is important for us to use public transport? Brainstorm in groups, the effect/impact that cars have on the environment. Are there positives and negatives? How many students travel to school each day using the bus, walking or riding their bike?</p> <p>Discuss in groups what benefits it has on the environment for us to take more cars off the road and start using public transport more often.</p>	<div style="border: 2px solid blue; padding: 10px;"> <h3 style="text-align: center; color: #00AEEF;">Why do we need a station?</h3> <ol style="list-style-type: none"> 1 Students brainstorm  ideas  on why they think it is important for us to use public transport? 2 Brainstorm  environment.  in groups  the effect that cars have on the environment.  Are there positives and negatives? How many students travel to school each day using the bus, walking or riding their bike? 3 Discuss  in groups  what benefits it has on the environment for us to take more cars off the road and start using public transport more often. <p style="text-align: right;"></p> </div>
<p>Immersion Centre 4</p>	<p>LI am learning to create my own train model using LEGO resources</p> <p>SC: I can</p> <ul style="list-style-type: none"> • Explain the aspects of your train model • Explain why you have selected certain aspects for your train design <p>In small groups (3-4 students) have students create their own train models using lego, taking into consideration the elements needed for passengers to have a safe and comfortable trip/experience.</p>	<div style="border: 2px solid blue; padding: 10px;"> <h3 style="text-align: center; color: #00AEEF;">Create your own train</h3> <ol style="list-style-type: none"> 1 In watering holes  collect a LEGO  tub for your group.  2 Using LEGO  create  your own train  design. Make sure you include all the elements needed for your passengers to have a safe and comfy trip. <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> seats</div> <div style="text-align: center;"> lighting</div> <div style="text-align: center;"> windows</div> <div style="text-align: center;"> safety signs</div> <div style="text-align: center;"> technology</div> </div> <p style="text-align: right;"></p> </div>

<p>Immersion Centre 5</p>	<p>LI: I am learning to plan and predict future Sydney Metro infrastructure. SC: I can code the Sphero Indi's to represent Sydney Metro stations.</p> <p>Task: Students to use the Sphero Indi's and station signs to program and code the Sydney Metro train line. Students may investigate the speed and spaces between the station based on their physical location.</p> <p>Resources:</p> <ul style="list-style-type: none"> • Sphero Indi sets • Photos of stations signs (as applicable to your area/context) • Sphero Indi Cards 	<div style="border: 2px solid blue; padding: 10px;"> <h3 style="text-align: center; color: #00AEEF;">Predictions for Future Sydney Metro</h3> <ol style="list-style-type: none"> In a watering hole  collect a Sphero Indi  and station signs  for your group . Create  Sydney Metro  train line with the Sphero Indi . <p style="text-align: center;">Make sure you think about the speed and space between stations.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>the trains</p>  </div> <div style="text-align: center;"> <p>the stations</p>  </div> <div style="text-align: center;"> <p>location</p>  </div> </div> <p style="text-align: right;"></p> </div>
<p>Learning Centre 1</p>	<p>LI: We are exploring the past, present and future of trains. SC: I can:</p> <ul style="list-style-type: none"> • investigate the opportunities trains brought/bring to Australia during a specific time period • write three informative paragraphs paraphrasing the information explored on the past, present and future of trains <p>Read the following with the class. Discuss with students what they believe the value and impact trains would have for Australia.</p> <p>"The first Australian railway “Yesterday the turning of the first turf of the first Australian railway was accomplished, and the ceremony was performed by the daughter of the Governor of the colony, Honourable Mrs. Keith Stewart – in spite of the rain, which certainly interfered much with the programme of ceremonies. He felt it to be a pride and gratification to him, that the first railway in the Southern Hemisphere should be commenced in New South Wales during his administration: for he felt confident, that innumerable blessings must arise from it, in a social, political, and moral point of view.” Newspaper article , train from parramatta to sydney</p> <ul style="list-style-type: none"> • What opportunities do you think trains would have had during that time? • What opportunities do you think trains have on Australia today? • What opportunities do you think trains have on Australia's future? 	<div style="border: 2px solid red; padding: 10px;"> <h3 style="text-align: center; color: red;">Past, Present and Future!</h3> <ol style="list-style-type: none"> In watering holes  of three, allocated each person a time period - 'Past', 'Present' or 'Future'. Your responsibility is to investigate  trains during that time period. Find a peer/s  from another group who is allocated the same time period as you and use the links provided on your OneNote  storyboard to research  trains during that time. <ul style="list-style-type: none"> • Write  a minimum of 10 VIPs. Return to your watering hole  and share  your VIPs with your group. <ul style="list-style-type: none"> • Answer any wondering  your group may have about your time period. • On a new OneNote  page, collaboratively write  3x informative paragraphs under the subheadings, 'Past', 'Present' or 'Future'. <p style="text-align: right;"></p> </div>

Past
[History of Australia's trains](#)
[History of Queensland's Trains](#)
[History of Sydney's Trains video](#)
[Locomotive no.1](#)

Present
[Sydney's Metro Trains 360 Video](#)
[Australia's first fully-automated rail system](#)
[The Indian Pacific – Australia's Longest Train Journey](#)

Future
[How will the trains of the future be powered?](#)
[Hydrogen trains: Will this be the future of trains in Australia?](#)
[Future plan for Sydney](#)

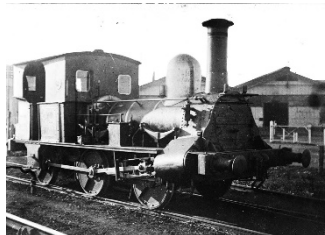
Learning Centre 2

LI: We are learning to compare the mechanics of trains from the past and current trains.
 SC: I can

- Identify the history, design, carriages and seating arrangements in electric and steam trains.
- Identify the similarities and differences between steam and electric trains using researched evidence.

Explicitly teach the meaning of the mechanics within trains. Create an anchor chart as a homebase of what the mechanics of trains can include. Discuss trains from the past and present, leading to a discussion about steam and electric trains.

First Steam Train in Australia 1854



First electric Train in Australia 1918



Mechanics of a Train - Steam & Electric

1. Look at the pictures of Steam trains from the [Powerhouse museum](#) collection. Read the [informative text](#) and take notes about the history, design, engine capabilities, carriages and seating arrangements. Answer the questions in your workbook:
 - What is a steam engine? Are steam engines still used today?
 - Where did people sit in a steam train? Why?
 - Why did steam trains have 'class' carriages? Why were they important?
 - What did the exterior and interior of Locomotive No 1 train look like? What are the key features?
2. Look at [video](#) of the new Sydney Metro trains (electric trains). Read the [informative text](#) and infographic attached and take notes about the seating, passenger access, and possible aesthetics.
 - What powers the Sydney Metro train? What energy powered steam trains?
 - Do people sit in particular areas on trains today? Why or why not?
 - What new features might a Sydney Metro train have when compared to steam trains?
3. Complete a Venn Diagram comparing a steam train to an electric train

Look at the pictures of steam trains from the [Powerhouse museum](#) collection. Read the [informative text](#) and take notes about the history, design, engine capabilities, carriages and seating arrangements.

Students to answer the following questions:

- What is a steam engine? Are steam engines still used today?
 - Where did people sit in a steam train? Why?
 - Why did steam trains have 'class' carriages? Why were they important?
 - What did the exterior and interior of Locomotive No 1 train look like? What are the key features?
1. Look at [video](#) of the new Sydney Metro trains (electric trains). Read the [informative text](#) and infographic attached and take notes about the seating, passenger access, and possible aesthetics.
 - What powers the Sydney Metro train? What energy powered steam trains?
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 - What new features might a Sydney Metro train have when compared to steam trains?
 2. Complete a Venn Diagram comparing a steam train to an electric train

Play [video](#) in the background to immerse students in the variety of railways and trams around in Australia.

Learning
Centre 3

LI: We are learning to determine the most effective train station designs.

SC: I can




- Research information about a train station
- Write a persuasive text on my station using facts and details

Working in small groups, provide students with a train station design to investigate, either underground or above ground. Using the topic given students will research information to support their writing of persuasive text as a group to convince your audience that your design is the best.



Once completed, groups will share/present their persuasive text to the class.

Students to vote on the most persuasive.

Global Trains

1 In [watering holes](#)  investigate [train station designs](#).
Research  information about the advantages  of that system.

2 Collaboratively write  a persuasive text about why your system is better.

3 Once complete in a campfire  two teams will compete at a time, sharing their persuasive text with the class.
-Students to vote  on the most persuasive.

Once all texts have been read, discuss overall, the pros and cons of each station design and why you would use one over the other.

Learning Centre 4

LI - I am learning to understand the term accessibility and how train stations make their designs accessible for everyone.

SC - I can

- define the term 'accessibility'
- research and identify different solutions to challenges that people might face when accessing a train station.

As a class go through the definition of accessibility:

- the quality of being able to be reached or entered.

Students to consider the following:

It is harder for some people to use train than others. When designing a train station it is important that everyone is able to be access it. What problems can you see in the following video? Watch the following video and discuss as a class:

- <https://www.youtube.com/watch?v=4rabbDgvnHo>

Inform students that it is important to be aware of the challenges that people might face when using trains. In groups, look at the following situations and list some challenges these people might face when using trains. Research and discuss any possible solutions to these challenges. Students to present their ideas in a table:

Challenges	Solutions

Accessibility situations to research/consider

- Eldery
- Visually impaired
- Hearing impaired
- Wheelchair user

Accessibility on trains and train stations.

1. In campfire think about what the word 'accessibility' means. Watch the video about some challenges that some people might face when using trains
2. In watering holes, complete a table in your book showing the challenges and solutions that you can find when using a train.
3. Return to campfire and share any solutions you may have found about how we can make trains and train stations more accessible.

- Families going away on holiday.

As a class, collaboratively come back together as a class and share findings.

Learning Centre 5

LI: I am learning to understand the different ways that infrastructure is shaped








SC: I will be successful if I can:


- Understand what infrastructure mean
- Explore different train stations across the world and what they look like
- Make judgements and conclusions as to why architects design buildings the way they do

Explicitly teach students what infrastructure is and get students to brainstorm examples of types of infrastructure they know of.






- Watch the 360° view clips of 4 different train stations around the world.
 - [Sydney Metro: Parramatta metro station 360 degrees](#)
 - [Brief walk through Grand Central Terminal in New York City to catch a train - 360 degree video](#)
 - [King's Cross Station 360 degree walkthrough \(London, England\)](#)
 - [360 VR Tour | Amsterdam | Amsterdam Centraal | Railway station | Outside | VR Walk | No comment tour](#)
- Complete a PMI on each station noting down observations and any wonderings
- With a partner brainstorm why you think the architect has designed the buildings the way they have.












Different Shapes of Infrastructure







- 1
 Watch  the 360° view clips of 4 different train stations around the world.
 - [Sydney Metro: Parramatta metro station 360 degrees](#)
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 - [King's Cross Station 360 degree walkthrough \(London, England\)](#)
 - [360 VR Tour | Amsterdam | Amsterdam Centraal | Railway station | Outside | VR Walk | No comment tour](#)
- 2
 Complete  a PMI chart on each station noting down observations  and any wonderings 
- 3
 With a partner  brainstorm  why you think the architect has designed  the buildings the way they have.


LCS 

Hi students  of Jordan Springs Public School .


From the team at Sydney Metro , we have a very special inquiry task for students  across Kindergarten to Year 6 at Jordan Springs Public School . It must be so very exciting to be at a brand new school  and also to be in the new suburb of Jordan Springs .



Our team at the Metro  has noticed a significant increase  in people driving  to, and around the Penrith area, in particular Jordan Springs. We have also seen a rise in the number of people  accessing nearby train stations . As a result, we would like to offer the opportunity to your school  to create a proposal design for a future metro station  at Jordan Springs . Through the proposal of a future metro station, we aim to provide transport  opportunities to the residents  living in and around the Jordan Springs  area.


We know that this is such a big task and there so are many things to consider for you metro station  design! So to help you in successfully completing this inquiry we have provided you with a criteria  to assist you in your planning . We can imagine how many brilliant ideas  you must have buzzing  around in your brains .

In your design of the new metro station , you are to include:

- A description and labelled map of where the train station will be located.
- A labelled floor plan of the train station
- Accessibility options at the train station and within the trains (wheelchair access, prams, priority seating, luggage and bicycles, lifts,)
- A digital design of the train station using SketchUp
- Signage designs for the train station
- A list of connecting train lines/stations near Jordan Springs
- Pick up/drop off areas and a multi-storey parking space
- Safety at the train station and near the edge of the platforms

Your final design is due  to your homebase teachers by the 23rd of September 2022 (Term 3 Week 10).

Across Week 4 and 5 of Term 3, you will be participating in immersion stations and expert  sessions to immerse yourselves in the learning to begin your challenge. It is now time to get your creative  hats on!

We wish you all the best , and we absolutely cannot wait to see the final product.

Kind regards,

Sydney Metro Team 