


SYDNEY METRO NORTHWEST: A COMPLETE UNIT OF WORK

Key Learning Area	Unit or lesson title and main focus questions	Most appropriate level and suggested number of lessons
 Science	Sydney Metro Northwest : A complete unit of work How do we travel by land, sea, air? How has transport changed (speed, safety, cost, number of people)? How does a railway work (tickets, timetables, tracks, networks)? Why does Sydney need Sydney Metro Northwest (where do people live, work, play)?	Stage 1 8-10 lessons
	What are other benefits of a railway (employment, shops, car parks, security)? Where will Sydney Metro Northwest go (route, stations, infrastructure, links to other public transport systems)?	
	Geography	

Teacher briefing

This unit of work meets syllabus outcomes from the Built Environments (ST1-14BE) Strand of the NSW Science K-10 Syllabus. It is designed to be taught over one term. Approximately one hour should be allocated to each lesson. Primary schools also often have a stage or school scope and sequence that spans two years (odd and even), indicating which outcomes are being covered when, and with what units or topics. This unit of work may best be taught in Term 3.

SMART Notebook slides and worksheets are included to support teachers in implementing this unit of work. It is suggested that students participate in an excursion involving train travel as a part of this unit.

Unit plan	
Lesson 1	How do we travel by land, sea, air?
Lesson 2	How has transport changed (speed, safety, cost, number of people)?
Lesson 3	How does a railway work (tickets, timetables, tracks, train networks)?
Lesson 4	Why does Sydney need Sydney Metro Northwest (where do people live, work, play)? What are other benefits of a railway (employment, shops, car parks, security)?
Lesson 5	Where will Sydney Metro Northwest go (route, stations, infrastructures, links to other public transport systems)? Students plan and design their own railway incorporating features previously discussed.
Lesson 6 & 7	Students construct a 3D model of their railway. This could be a paired, group or whole class activity.
Lesson 8	Summative Assessment.

Syllabus links

Science K-10

(ST1-1VA) shows interest in and enthusiasm for science and technology, responding to their curiosity, questions and perceived needs, wants and opportunities

(ST1-2VA) demonstrates a willingness to engage responsibly with local, national and global issues relevant to their lives and to shaping sustainable futures

(ST1-VA3) develops informed attitudes about the current and future use and influence of science and technology based on reason

(ST1-4WS) investigates questions and predictions by collecting and recording data, sharing and reflecting on their experiences and comparing what they and others know

(ST1-5WT) uses a structured design process, everyday tools, materials, equipment and techniques to produce solutions that respond to identified needs and wants

(ST1-14BE) describes a range of places and spaces in the local environment and how their purposes influence their design.

Geography K-10

Stage 1 - Features of places & People and places

(GE1-1) describes features of places and connections people have with places

(GE1-3) communicates geographical information and uses geographical tools.

Lesson 1 – How do we travel by land, sea, air?

At the end of the lesson students will be able to:

State different methods of transport on land, sea and air.

Requirements for this lesson

- ▶ Lesson 1 Notebook (page 38)
- ▶ Lesson 1 worksheet (page 39-40)
- ▶ Lesson 1 Smart Response Unit Quiz.

Learning experiences

Step 1 – Class activity

Introduce the theme for the term. Ask pupils what 'transport' means. Brainstorm different forms of transport and record on Notebook slide or board.

Students examine images on Notebook slide and categorise these images into two or three different groups. Encourage students to classify images according to different qualities, e.g. fast/slow, transport lots of people/transport only a few people. Conclude with sea/land/air.

Step 2 – Individual activity

Students complete worksheet listing or drawing different types of transport they have used, and categorising images into sea, land and air. A student's fine motor skills may influence the number of pictures used.

Step 3 – Complete Pre-Unit Transport Smart Response Unit Quiz

Students answer questions by entering their answers into Smart Response Units, by writing down their answers or by raising their hand. Teacher leads discussion generated from the questions.

Step 4 – Extension activity

Capable students could be encouraged to make sub categories within each group, i.e. land transport for many people, land transport for only a few people.

Lesson 2 – How has transport changed?

At the end of the lesson students will be able to:

Describe how transport has changed.

Requirements for this lesson

- ▶ Notebook images of transport over time
- ▶ Lesson 2 worksheet (page 41–43).



Web links

Learning Objects Cobb and Co. interactive website (login required)

<https://sso.det.nsw.edu.au/sso/UI/Login>

TALE website

<https://www.tes.com/elements-welcome/activity/Transport-Timeline-87>

Learning experiences

Step 1 – Class activity

Review types of transport by land, sea and air from previous lesson. Encourage discussion about safety, comfort, speed and number of people who can be transported. Direct discussion to conclude transport has changed over time.

Step 2 – Watch interactive video about Cobb and Co.

Watch <http://www.nma.gov.au/interactives/tlf/cobb/index.html> and discuss changes presented.

Present pictures of land transport over time and discuss the changes which have occurred. Encourage students to describe improvements and the benefits of these changes. Repeat for sea and air transportation.

Step 3 – Complete interactive sequencing activity from TALE website

<https://www.tes.com/elements-welcome/activity/Transport-Timeline-87> or on Notebook slide.

Students complete individual sequencing activity for land, sea and air (worksheet 2). Teachers may need to modify the number of images to sequence to suit individual student needs.

Students identify the types of transport that are fast, safe, able to transport lots of people, cover long distances.

Lesson 3 – How does a railway work (tickets, timetables, tracks, train networks)?

At the end of the lesson students will be able to:

Describe how a railway system works.

Requirements for this lesson

- ▶ Lesson 3 worksheet (page 44).

Learning experiences

Step 1 – Musical activity

<https://www.youtube.com/watch?v=uyzifBF6h1w>

Display the Sydney Metro Northwest map on the board and identify the stations it will stop at. Teacher draws a simplified version of the map on the interactive whiteboard, including a couple of stations. Stations familiar to students could be included. Capable students could be shown how this track links to another track. The terms 'line' and 'network' could be introduced here.

Step 2 – Worksheet activity

Students complete worksheet 3.

Lesson 4 – Why do we need Sydney Metro Northwest?

At the end of the lesson students will be able to:

State reasons why Sydney needs Sydney Metro Northwest and state some of the benefits of the railway to the North West region.

Requirements for this lesson

- ▶ Lesson 4 worksheet (page 45).



Web links

Map showing the Sydney Basin

https://en.wikipedia.org/wiki/Sydney_Basin#/media/File:Karte_Sydneybecken.png

Map showing Sydney's rail network

<http://www.australia.edu/Travel/cityrail-network-maps.html>

Map showing population of Sydney suburb

<https://blog.id.com.au/2012/population/australian-population/sydneys-population-a-story-%20of-consolidation/>

Learning experiences

Step 1 – Mapping activity

Revise knowledge about different types of land travel (car, bus, train, bike, foot).

Show students a map of Sydney on the interactive whiteboard and identify different areas of Sydney, (e.g. North West region, city, beaches, sporting venues). Highlight the roads that lead to the North West region and discuss traffic congestion.

Step 2 – Class discussion

Overlay a map of Sydney Trains network to show there are no train lines in the North West region. Explain this is part of the reason why a rail link to the North West region is being built.

Discuss some of the benefits of having a rail link to the North West region, such as better transport opportunities for people, creation of employment, access to shops, car parks and security.

Students complete Lesson 4 worksheet.

Lesson 5 – Where will Sydney Metro Northwest go?

At the end of the lesson students will be able to:

Show where Sydney Metro Northwest will go and state some infrastructure associated with it, (e.g. car parks, shops, links to other transport systems).

Requirements for this lesson

- ▶ Lesson 5 worksheet (page 46).

Learning experiences

Step 1 – Class discussion

Review the need for Sydney Metro Northwest from previous lesson (i.e. population and transport requirements of people in the North West region).

Step 2

Present the Sydney Metro Northwest map on interactive whiteboard, highlighting where the stations are located. Discuss which stations are closest to school, students' houses and other important facilities in their experience.

Discuss how the rail link will provide easier access to shops, workplaces, and parks.

Discuss the reasons why some parts of the rail link will be below ground, ground level and above ground level (environmental reasons – watercourses, safety, costs).

Step 3 – Individual activity

Students complete worksheet 5 by drawing their own railway track. Students should include stations, car parks, bus stops, tunnels, bridges and shopping centres.

Lessons 6 and 7 – Students construct a 3D model of their railway.

This could be a paired, group or whole class activity.

At the end of the lesson students will be able to:

- ▶ Construct a 3D model of a railway using everyday materials.

Requirements for this lesson

- ▶ Cardboard boxes of varying sizes, plasticine, Lego, straws, blocks, cellophane, paddle pop sticks, corks, crepe paper, sticky tape, glue, masking tape and other relevant craft materials.

Learning experiences

Step 1 – Group activity

Review features of a railway, e.g. stations, car parks, bus stops, bridges, tunnels and the reasons for some of these features including safety, environmental issues and costs.

Step 2

Place students in small groups to construct a 3D model of a railway. Each group could make their own railway, or the teacher could allocate aspects of a railway for each group to make, which are then combined to make a whole class network.

Students should be able to describe why they are constructing a station/car park/bridge or tunnel in a particular place, e.g. proximity to sporting grounds or shopping centres, to cross rivers, protect animal habitats.

Step 3

Students present their railway (or aspect of railway) to the rest of the class describing particular features and the reasons for each feature. Students should also be able to explain reasons for their choice of materials.

Lesson 8 – Summative assessment

Requirements for this lesson

- ▶ Lesson 8 worksheet (page 47–48).

Assessment

Teachers can assess the work of individual students after each lesson. This assessment task is a summative task intended to show what knowledge students have retained over the course of the unit.

Teacher references and worksheets

SMART Notebook files and worksheets in Microsoft Word can be downloaded from the Sydney Metro Northwest website.



Web links

SMART Lesson 1 Notebook How do we travel

<https://www.sydneymetro.info/sites/default/files/resource/Primary%20appendix%20-%20SMART-Lesson-1-How-do-we-travel.docx> (Word version)

<https://www.sydneymetro.info/sites/default/files/resource/Primary%20appendix%20-%20SMART-Lesson-1-How-do-we-travel.zip> (SMART Notebook File)

SMART Lesson 1 Quiz

<https://www.sydneymetro.info/sites/default/files/resource/Primary%20appendix%20-%20SMART-Lesson-1-Quiz.docx> (Word version)

<https://www.sydneymetro.info/sites/default/files/resource/Primary%20appendix%20-%20SMART-Lesson-1-Quiz.notebook> (SMART Notebook File)

Activity sheet page 239-241

<https://www.sydneymetro.info/sites/default/files/resource/Primary%20activity%20sheets%201-2%20-%20Planning%2C%20design%20and%20building%20a%20railway.docx>

Sources and activity sheets pages 127-131

<https://www.sydneymetro.info/sites/default/files/resource/Primary%20teacher%20source%20and%20activity%20sheets%201-5%20Linking%20the%20Nation.docx>

Sydney Metro Northwest lesson worksheets 38-48

<https://www.sydneymetro.info/sites/default/files/resource/Primary%20teacher%20activity%20sheets%201-8%20-%20A%20Railway%20for%20Sydney%27%20North%20West%20Region.docx>

NOTEBOOK



Name: _____

Date: _____

LESSON 1 WORKSHEET

1. In the box below, list or draw a picture of different types of transport you have travelled on.

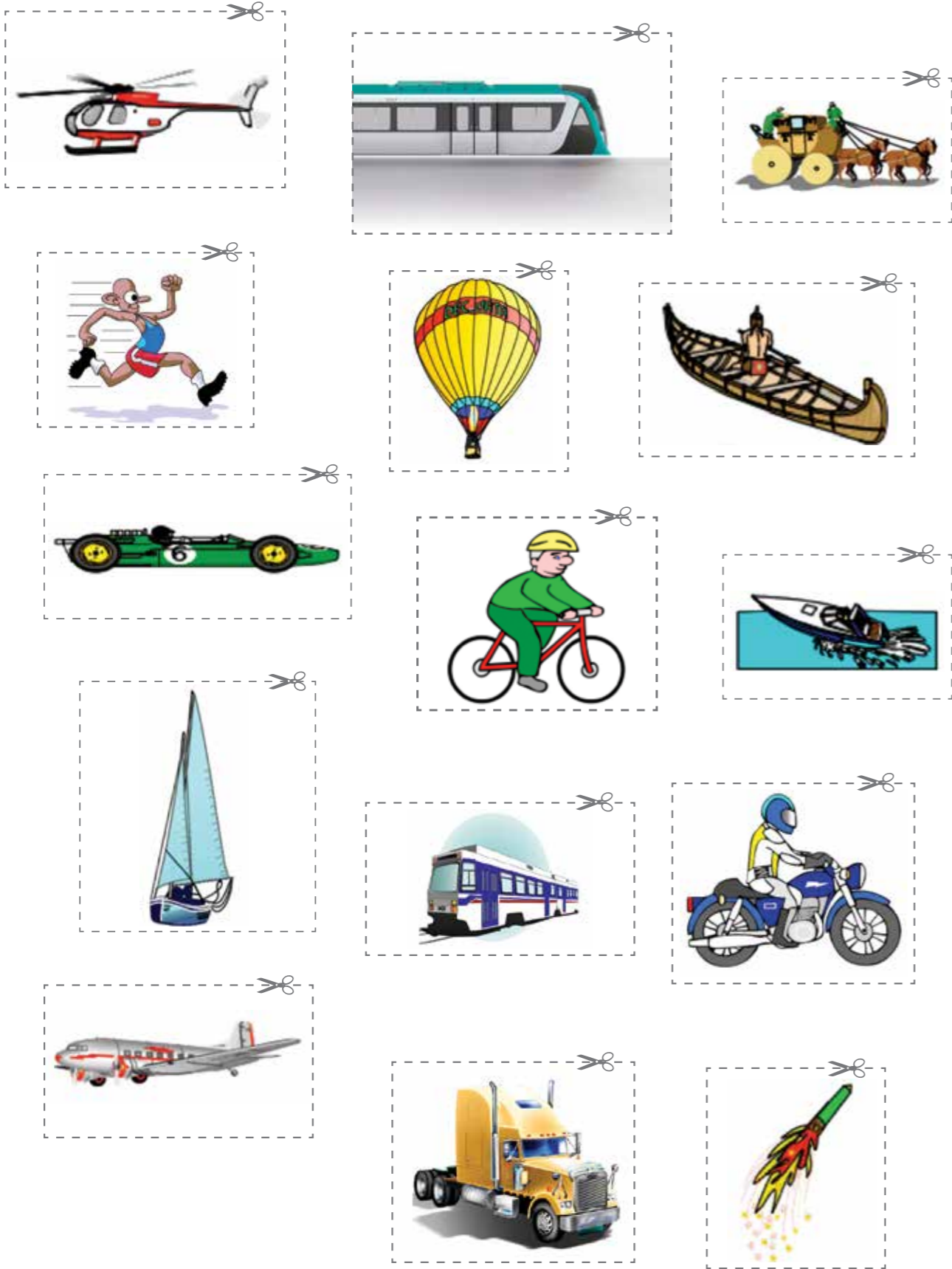
2. Cut out the pictures from the next page and glue them in the correct place.

Sea

Air

Land

LESSON 1 WORKSHEET



LESSON 2 WORKSHEET

How has transport changed?

1. Draw or glue pictures to show how transport has changed.

Land

Sea



LESSON 2 WORKSHEET

Air



2. Circle the words that describe each type of transport.



Safe

Comfortable

Fast

Can transport many people



Safe

Comfortable

Fast

Can transport many people



Safe

Comfortable

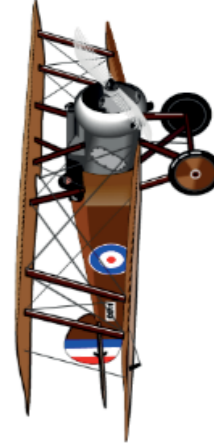
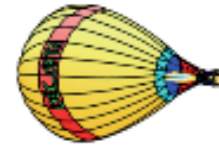
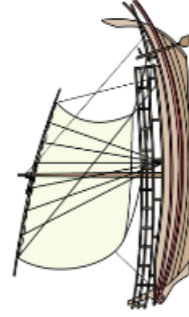
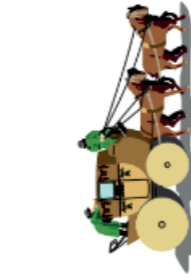
Fast

Can transport many people



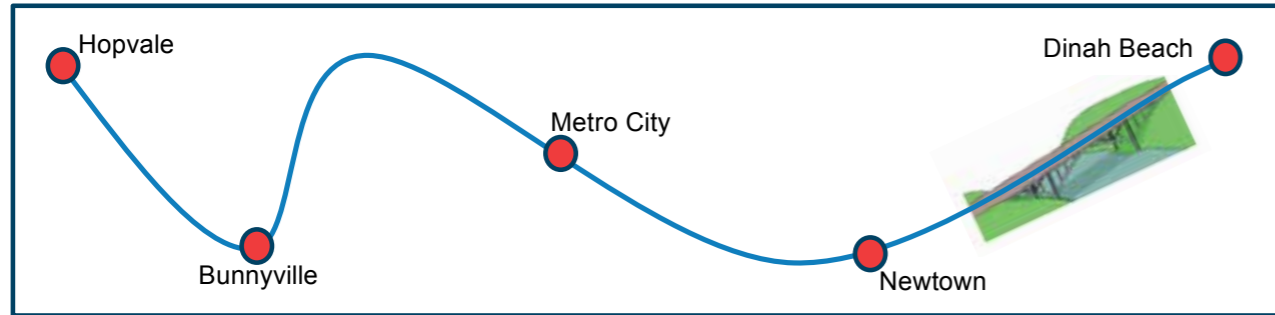
LESSON 2 WORKSHEET

Examples of images which could be used.



LESSON 3 WORKSHEET

Trace over the train track, then draw a circle around the stations.



Circle and write what this machine is used for.



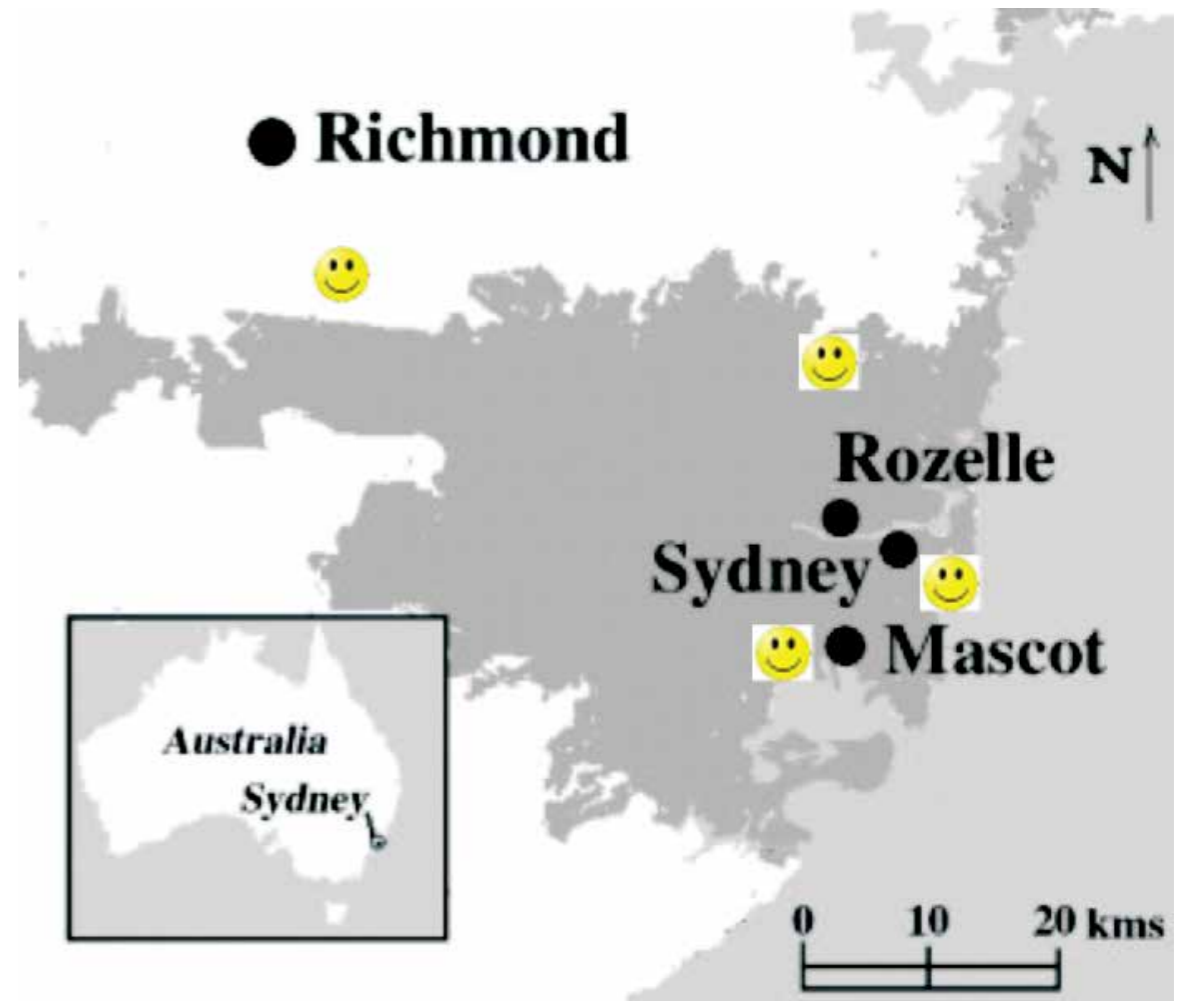
This machine is for _____

Timetable	
9.00	Hopvale
9.30	Bunnyville
10.00	Metro City
10.30	Newtown
11.00	Dinah Beach

1. What time does the train leave Hopvale? _____
2. Which station does it go to next? _____
3. What time does the train get to Newtown? _____
4. How long does it take to get from Hopvale to Metro City? _____

LESSON 4 WORKSHEET

Draw more 😊 to show where people live in the Sydney basin.



Map of Sydney from website <http://www.sciencedirect.com/science/article/pii/S0048969707003397>

Make a list of some of the benefits of having a railway to the North West region.

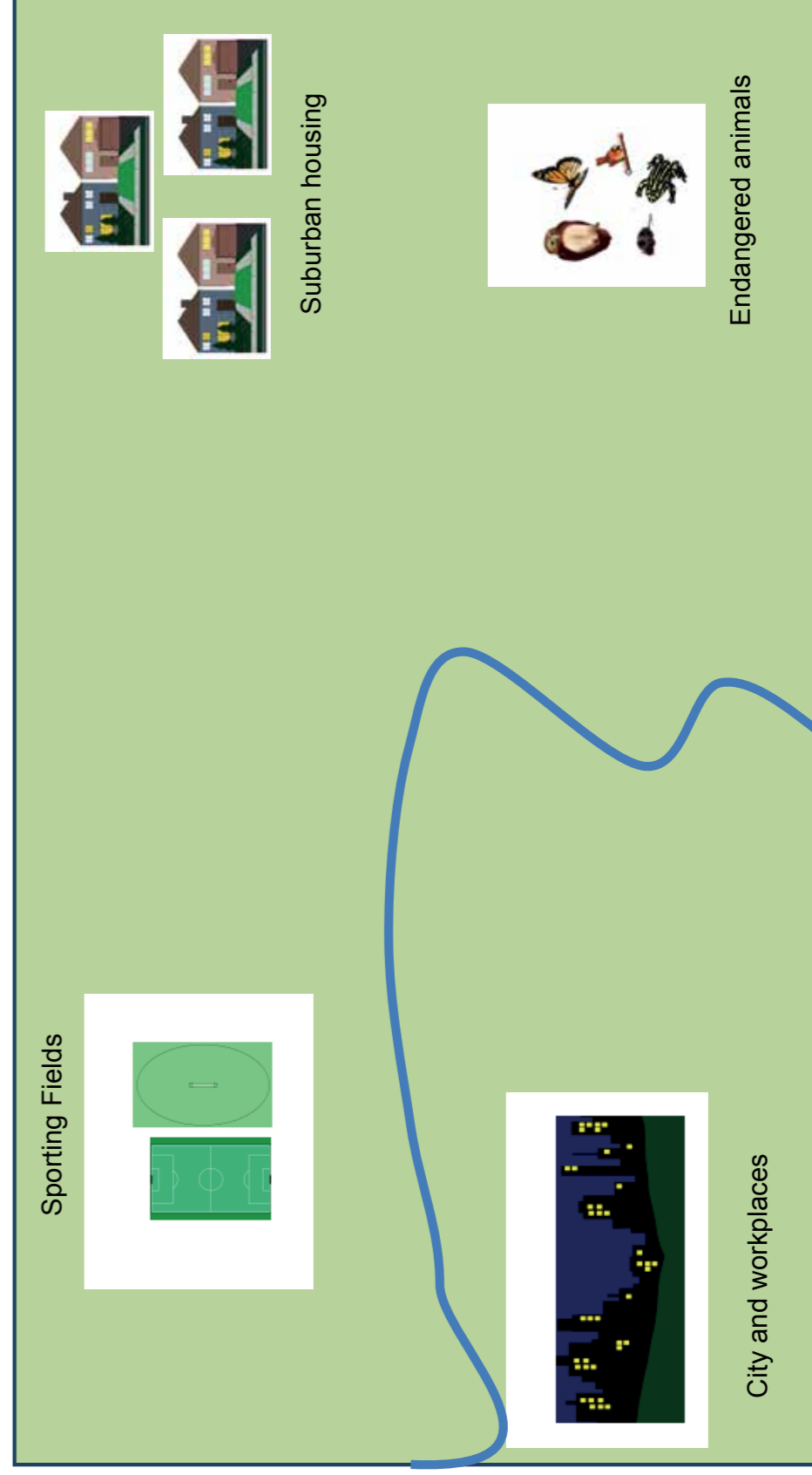
LESSON 5 WORKSHEET

In the space below, draw your own map of a railway. You will need to include: some stations, car parks, bus stops, tunnels, bridges, shopping centres, etc.



LESSON 8 WORKSHEET - ASSESSMENT TASK

On the map below, draw a railway line that will enable people to get to important places. You will need to include at least two stations and some of the other features we have discussed in this term. Remember to label your diagram.



LESSON 8 WORKSHEET

2. Put a circle around land transport.



3. Number these pictures 1 – 4 from oldest to newest.



4. List some things you would see on a railway system.

5. Why does Sydney need Sydney Metro Northwest?

6. What are some of the things the Government need to consider when building Sydney Metro Northwest?



Artist's impression of the skytrain at Kellyville Station