


Creating a railway timetable

Key Learning Area	Unit or lesson title and main focus questions	Most appropriate level and suggested number of lessons
 Science and Technology	Creating a railway timetable How is rail travel enhanced by not needing to consult a timetable?	Stage 3
		1-2 lessons

Teacher briefing

This ICT activity helps students understand key features of Sydney Metro Northwest. It helps students explore the focus question of the Topic: What will Sydney Metro Northwest mean for me and for my daily life?

The information gained from this activity is used to create a timetable for Sydney Metro Northwest using Microsoft Excel software. The activity can be modified to suit various ICT abilities and stages. An understanding of current Sydney Trains' timetables is a prerequisite for the lesson.

If students are unfamiliar with railway timetables, a lesson is included in Topic 2 called 'Using and Interpreting Timetables'. This could be taught preceding this lesson.

Requirements for this lesson

- iPads
- Computers or laptops
- Interactive whiteboard.

Assessment

This lesson provides multiple opportunities to assess the students' comprehension of train timetables and can be used for summative assessment.

Key terms and vocabulary

Sydney Metro Northwest, train timetables, single deck trains, location, dwell time, improvements.

Web links



Free iPad mind mapping Apps:

Idea Sketch

<https://itunes.apple.com/au/app/idea-sketch/id367246522?mt=8>

SimpleMind

<https://itunes.apple.com/us/app/simplemind-mind-mapping/id305727658?mt=8>

Total Recall

<https://itunes.apple.com/us/app/total-recall/id360443748?mt=8>

Free computer software programs:

Concept maps/mind mapping tool

<http://bubblus.com>

Syllabus links

Science and Technology K-6

(ST3-2DP-T) plans and uses materials, tools and equipment to develop solutions for a need or opportunity

(ST3-3DP-T) defines problems, and designs, modifies and follows algorithms to develop solutions

Values and Attitudes

Students value the importance and contribution of science and technology in developing solutions for current and future personal, social and global issues and in shaping a sustainable future

Learning experiences

Step 1 – Think Pair Share

Teacher displays the Sydney Metro Northwest map on the Interactive White Board (See web links). Using the 'Think Pair Share' strategy, students discuss the location of the eight new Sydney Metro Northwest stations.

Use these questions as a guide:

- Which Sydney Metro Northwest station is closest to our school?
- Which Sydney Metro Northwest station is closest to your house?
- Where does the line begin and finish?
- With what railway lines does Sydney Metro Northwest connect?

Step 2 – Class activity

Teacher facilitates a class discussion about the innovative features of Sydney Metro Northwest, and what this means for the service, its timetable and its customers.

Teacher note: the following information has been taken from Sydney Metro Northwest *Project Overview* September 2015, pages 8, 10–13.

https://www.sydneymetro.info/sites/default/files/15082-Project-overview-September-2015_web.pdf%3Fext%3D.pdf

Key innovative rail features include:

- Australia's first fully-automated metro rail system
- Platform screen doors
- Efficient timetabling
- Improvements to platform efficiency and design
- Less time for trains remaining at stations (dwell time)
- Single deck, automated metro trains
- 15 trains per hour in peak times
- Cross platform interchange at Chatswood
- Major bus interchanges at Rouse Hill and Castle Hill
- 4000 car parking spaces spread over five railway stations
- Travel facilities for customers using bus, pedestrian, car and bikes to access stations
- Sydney Metro Northwest is a rail line that uses ground level, underground and elevated tracks.

Step 3 – Group task

In groups of two to five, students create a concept map that details how Sydney Metro Northwest will positively affect timetabling and the train travel experience for customers.

Students create concept maps on iPads using free Apps. (See web links). If iPads are unavailable use computers, laptops or paper. Each group is given a particular key feature of Sydney Metro Northwest to focus on:

These could include:

- What is a single deck metro train? Why would a single deck metro train affect the timetable?
- 15 trains per hour are planned. How will this affect the Sydney Metro Northwest train timetable?
- Cross platform interchange. How might this affect train times and the Sydney Metro Northwest timetable?
- 4000 car parking spaces and facilities for different types of customer access to Sydney Metro Northwest
- Sydney Metro Northwest is a train line that utilises ground level, underground and elevated tracks. How will these factors affect the Sydney Metro Northwest timetable?
- What are platform screen doors? How do they help passengers?

Step 4 – Group task

In groups create a concept map listing different ways key features of Sydney Metro Northwest have positively affected the timetable.

Each group presents their concept map to the class. The most effective ideas are added to the whole class concept map.

- What does fully-automated system mean?
- What other countries have fully-automated systems?

Step 5 – Group or individual task

Create a 'Sydney Metro Northwest Timetable' using Microsoft Excel. Teacher models and discusses specific criteria that could include:

- Stations
- Times
- Frequency
- Time notations: am, pm, 24 hour clock
- Signage.

Step 6 – Reflective activity

Using ICT students present their ‘Sydney Metro Northwest Timetables’ to the class.

- Students present their timetables and ask other students to read/interpret them
- Teacher discusses different approaches to timetable construction. Does a school timetable use the same principles?
- The class links the mock timetables with innovative concepts of Sydney Metro Northwest.

T1
Berowra to City via Gordon

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Monday to Friday	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ				
Service Information	SFD																							
Berowra	03:41	-	-	-	-	-	04:38	-	-	-	-	-	-	-	-	-	-	-	-	05:39	-	-	-	-
Mount Kuring-gai	-	-	-	-	-	-	04:42	-	-	-	-	-	-	-	-	-	-	-	-	05:43	-	-	-	-
Mount Colah	-	-	-	-	-	-	04:45	-	-	-	-	-	-	-	-	-	-	-	-	05:46	-	-	-	-
Asquith	03:49	-	-	-	-	-	04:48	-	-	-	-	-	-	-	-	-	-	-	-	05:49	-	-	-	-
Hornsby	ARR 03:52	-	-	-	-	-	04:51	-	-	-	-	-	-	-	-	-	-	-	-	05:52	-	-	-	-
Hornsby	DEP 03:53	-	04:11	-	04:26	-	04:52	04:41	-	04:56	-	05:11	-	05:26	-	05:53	05:41	-	-	05:53	05:41	-	-	05:54
Waitara	-	-	04:13	-	04:28	-	04:43	-	04:58	-	05:13	-	05:28	-	05:43	-	05:58	-	-	05:43	-	-	-	05:57
Wahroonga	-	-	04:15	-	04:30	-	04:45	-	05:00	-	05:15	-	05:30	-	05:45	-	05:59	-	-	05:45	-	-	-	05:59
Warrawee	-	-	04:17	-	04:32	-	04:47	-	05:02	-	05:17	-	05:32	-	05:47	-	06:01	-	-	05:47	-	-	-	06:01
Turramurra	-	-	04:19	-	04:34	-	04:49	-	05:04	-	05:19	-	05:34	-	05:49	-	06:03	-	-	05:49	-	-	-	06:03
Pymble	-	-	04:22	-	04:37	-	04:52	-	05:07	-	05:22	-	05:37	-	05:52	-	06:06	-	-	05:52	-	-	-	06:06
Gordon	-	-	04:24	-	04:39	-	04:54	-	05:09	-	05:24	-	05:39	-	05:54	-	06:09	-	-	05:54	-	-	06:03	06:09
Killara	-	-	04:26	-	04:41	-	04:56	-	05:11	-	05:26	-	05:41	-	05:56	-	06:11	-	-	05:56	-	-	06:05	06:11
Lindfield	-	-	04:28	-	04:43	-	04:58	-	05:13	-	05:28	-	05:43	-	05:58	-	06:13	-	-	05:58	-	-	06:07	06:13
Roseville	-	-	04:31	-	04:46	-	05:01	-	05:16	-	05:31	-	05:39	-	05:46	-	05:54	-	-	06:01	-	-	06:09	06:15
Chatswood	-	-	04:34	-	04:49	-	05:04	-	05:19	-	05:34	-	05:43	-	05:49	-	05:58	-	-	06:04	-	-	06:13	06:19
Artarmon	-	-	04:36	-	04:51	-	05:06	-	05:21	-	05:36	-	05:45	-	05:51	-	06:00	-	-	06:06	-	-	06:15	06:21
St Leonards	-	-	04:38	-	04:53	-	05:08	-	05:23	-	05:38	-	05:47	-	05:53	-	06:02	-	-	06:08	-	-	06:17	06:23
Wollstonecraft	-	-	04:41	-	04:56	-	05:11	-	05:26	-	05:41	-	05:50	-	05:56	-	06:05	-	-	06:11	-	-	06:20	06:26
Waverton	-	-	04:43	-	04:58	-	05:13	-	05:28	-	05:43	-	05:52	-	05:58	-	06:07	-	-	06:13	-	-	06:22	06:28
North Sydney	-	04:40	04:46	04:55	05:01	05:10	-	05:16	05:25	05:31	05:40	05:46	05:49	05:55	06:01	06:10	-	-	06:16	06:19	06:25	06:31	-	
Milsons Point	-	04:42	04:48	04:57	05:03	05:12	-	05:18	05:27	05:33	05:42	05:48	05:51	05:57	06:03	06:12	-	-	06:18	06:21	06:27	06:33	-	
Wynyard	-	04:47	04:53	05:02	05:08	05:17	-	05:23	05:32	05:38	05:47	05:53	05:56	06:02	06:08	06:17	-	-	06:23	06:26	06:32	06:38	-	
Town Hall	-	04:51	04:57	05:06	05:12	05:21	-	05:27	05:36	05:42	05:51	05:57	06:00	06:06	06:12	06:21	-	-	06:27	06:30	06:36	06:42	-	
Central	04:30	04:55	05:01	05:10	05:16	05:25	05:28	05:31	05:40	05:46	05:55	06:01	06:04	06:10	06:16	06:25	06:28	06:31	06:34	06:40	06:46	06:48	-	
Redfern	-	04:57	05:03	05:12	05:18	05:27	-	05:33	05:42	05:48	05:57	06:03	06:06	06:12	06:27	-	-	-	06:33	06:36	06:42	06:48	-	
Burwood	-	-	05:12	-	05:27	-	-	05:42	-	05:57	-	06:12	-	06:27	-	-	-	-	-	06:42	-	-	06:57	-
Strathfield	-	05:09	05:15	05:24	05:30	05:39	-	05:45	05:54	06:00	06:09	06:15	06:18	06:24	06:30	06:39	-	-	06:45	06:48	06:54	07:00	-	
Lidcombe	-	05:15	-	05:30	-	05:45	-	-	06:00	-	06:15	-	-	06:30	-	06:45	-	-	-	-	-	07:00	-	
Auburn	-	05:18	-	05:32	-	05:48	-	-	06:02	-	06:18	-	-	-	-	-	-	-	-	-	-	-	-	
Clyde	-	05:21	-	05:35	-	05:51	-	-	06:05	-	06:21	-	-	-	-	-	-	-	-	-	-	-	-	
Granville	-	05:22	-	05:37	-	05:52	-	-	06:07	-	06:22	-	-	-	-	-	-	-	-	-	-	-	-	
Parramatta	-	05:26	-	05:41	-	05:56	-	-	06:11	-	06:26	-	06:30	06:37	-	06:52	-	-	07:00	07:07	-	-	-	

Figure 13: The Sydney Trains Northern Line timetable (as of October 2018). There are many rail timetable sites across the Internet. It is an interesting exercise to compare how different timetables work.

Teacher references and extension work

Extension activities

Students create an interactive Sydney Metro Northwest timetable using hyperlinks and promote their timetable using animations advertising key features. For more ideas, see Transport for NSW realtime Apps and Sydney Trains timetables layout and features.

<https://transportnsw.info/apps>

Stage modifications: Stage 2

Other countries have high-speed above ground trains. Find out about one such rail network. How does this network’s timetable operate? Explain your findings to the class.

For example:

<http://www.travelchinaguide.com/china-trains/shanghai-hongqiao-station.htm>

