




Design your own train interior layout

Key Learning Area	Unit or lesson title and main focus questions	Most appropriate level and suggested number of lessons
 Science and Technology	Design your own train interior layout How will new Sydney Metro Northwest single deck trains improve train travel for passengers?	Stage 1
 History		1-2 lessons
 Creative Arts		

Teacher briefing

Students compare steam locomotive trains of the past and the future single deck metro trains using the Powerhouse Museum website and Sydney Metro Northwest publications. They use their knowledge of past, present and future trains to design and label an effective interior plan for a Sydney Metro Northwest single deck train.

Their illustrations demonstrate an awareness of those features which are improvements compared to passenger trains of the past. Students also appreciate how socioeconomic issues in the past influenced people’s relationships with built environments such as the railways.



Figure 3: A life-size train model

Topic Three:
 Planning, designing
 and building a railway

Requirements for these lessons

- Interactive whiteboard
- Computer with Internet access
- Paper
- Suitable art materials such as crayons, coloured pencils, charcoal, lead pencils.

Assessment

Summative assessment of students' ability to work in large and small groups, and to use inquiry based learning strategies to compare and contrast information. Materials covered in this lesson also provide the opportunity for formative assessment on a design task following criteria.

Key terms and vocabulary

Sydney Metro Northwest, Locomotive No 1, steam trains, single deck metro train, past, future, design, exterior, interior, layout, innovative.

Web links



A variety of high quality photographs of Australian trains on the Australian Pictorials site

<http://www.australianpictorials.com/railways>

Interactive train photographs with relevant Australian information in the Powerhouse Museum Collection

<http://www.powerhousemuseum.com/collection/database/?irn=85816&img=99001>

Sydney's new train unveiled

<https://youtu.be/GKi69Az5UHI>

Syllabus links

Science and Technology K-6

(ST1-2DP-T) uses materials, tools and equipment to develop solutions for a need or opportunity

(ACTDEP007) produce designed solutions through iteration

(ACTDEP007) consider safety, sustainability and time constraints when producing solutions

(ACTDEP008) consider and discuss the impact of a design solution within an environment

History

Stage 1 – Present and past family life – differences and similarities between students' daily lives and life during their parents' and grandparents' childhoods, including family traditions, leisure time and communications/ and The past in the present – the impact of changing technologies on peoples' lives

(HT1-1) communicates an understanding of change and continuity in family life using appropriate historical terms

(HT1-3) describes the effects of changing technology on people's lives over time

(HT1-4) demonstrates skills of historical inquiry and communication.

Creative Arts K-6

(VAS1.1) makes artworks in a particular way about experiences of real and imaginary things.

Learning experiences

Step 1 – Class activity

Looking at steam trains. Teacher displays and explains the Powerhouse Museum Collection of steam train photos. Teacher provides information about the first Australian train in Sydney including a brief history, steam engine capabilities and design, with first, second and third class carriages and seating arrangements.



Figure 4: Powerhouse Museum Teacher Notes on the first train in NSW, 'Locomotive No 1' provides an excellent resource for these lessons.
Source: Powerhouse Museum.



Figure 5: Image from the Powerhouse Museum Collection: Inside an early train carriage.
Source: Powerhouse Museum.



Figure 6: Arrival of the first railway train at Parramatta, 1855, from Sydney.

Source: Trove, National Library of Australia.

Class develops a 'past and future train retrieval chart' using the question: What do we already know about steam trains?

As a class, using the Powerhouse Museum information and photographs, develop a retrieval chart focusing on the design elements and key features of the exterior and interior of a steam train.

Use these questions as a guide to stimulate class discussion and create the retrieval chart:

- 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?

Step 2 - Class activity

Students take a close look at Sydney's new single deck trains unveiled as part of Sydney Metro Northwest. (See web links). Teacher leads discussion about the important planned features of Sydney Metro Northwest trains such as seating, passenger access, and possible aesthetics.

Using the video as stimulus, add to 'past and future train retrieval chart' what we now know about Sydney Metro Northwest trains. Focus on the proposed design elements and key features of the exterior and interior of the train.

Use these questions as a guide to stimulate class discussion and add to retrieval chart:

- What powers the Sydney Metro Northwest 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 Northwest train have when compared to steam trains?

Step 3 – Individual activity

Students create a picture of an interior of a train using crayon or other suitable drawing materials and label the key features of their illustrations.

Teacher may need to demonstrate, illustrating a design plan on butcher’s paper, pointing out key features as shown in the video such as improved access with up to three doors, wide corridors and two seat access.

Alternatively, students may choose to illustrate a particular part of a train interior, such as doors, seats, windows, safety handles or poles.

Step 4 – Group activity: (three to five students)

Students take turns presenting their artwork and discussing the features they have chosen to illustrate. Groups develop a list of key features to present back to the class. Groups then take turns presenting their lists to the class and the teacher creates a class list on the interactive whiteboard using the students’ ideas.

Teacher asks students to reflect on the focus question – How will the new Sydney Metro Northwest single deck metro trains improve train travel for passengers?

Step 5 – Reflection

Class ‘Art Walk’ and reflection discussion. Each group lays out their artwork on tables and students form a line and walk past all of the designs. Teacher-led discussion about how their designs might improve the train travel experience of passengers.

Teacher references and extension activities

Stage modifications: Early stage 1

The lesson may be simplified. For example, the teacher might demonstrate a step-by-step illustration of a train interior layout and develop a set of key features with the class. The teacher then distributes the layout plans for the students to label the key features.

Extension activities

Students could convert their train interior plans into physical models using cardboard and recycled materials. Students could then use an iPad or camera to photograph their models, create lesson reports and add both the plans and the models to a class blog.