Teacher Resource

Episode 33
17th November 2020

High-Speed Hyperloop

Focus Questions

1. Discuss the BTN *High-Speed Hyperloop* story with another student.
2. What company built the Hyperloop?
3. The company is hoping that the Hyperloop will be able to go more than…
    a. 200 km per hour
    b. 1,200 km per hour
    c. 2,200 km per hour
4. How long would a trip from Melbourne to Sydney take?
5. The reason the Hyperloop can go so fast is the lack of friction. What does that mean?
6. What helps the capsule glide along in the tube?
7. Who came up with the idea of the Hyperloop?
8. What other new travel technology is being developed?
9. Illustrate an aspect of the *High-Speed Hyperloop* story.
10. What questions do you have about the story?

Activity

What do you see, think and wonder?

After watching the BTN *High-Speed Hyperloop* story hold a class discussion, using the following as discussion starters:

- What do you THINK about what you saw in the BTN *High-Speed Hyperloop* story?
- What does this video make you WONDER about the future of transport?
- Think of three QUESTIONS you have about the story.
- What did you LEARN from the BTN story?

Activity

Class Discussion

After watching the BTN *High-Speed Hyperloop* story, students will respond to the following questions:

- What is the Hyperloop?
- How does it work?
- What type of energy is used to power the Hyperloop?
- How is it different to traditional rail travel?
- What are the benefits of the Hyperloop?
- When do they predict it will be operating?

Key Learning

Students will generate and communicate design ideas for future modes of transport. Students will design a mode of transport that has minimal impact on the environment.

Curriculum

Design and Technologies – Years 3 and 4
Recognise the role of people in design and technologies occupations and explore factors, including sustainability that impact on the design of products, services and environments to meet community needs.

Generate, develop, and communicate design ideas and decisions using appropriate technical terms and graphical representation techniques.

Design and Technologies – Years 5 and 6
Examine how people in design and technologies occupations address competing considerations, including sustainability in the design of products, services, and environments for current and future use.

Generate, develop and communicate design ideas and processes for audiences using appropriate technical terms and graphical representation techniques

Design and Technologies – Years 7 and 8
Generate, develop, test and communicate design ideas, plans and processes for various audiences using appropriate technical terms and technologies including graphical representation techniques.

Activity

Inquiry

Discuss the story as a class and ask students to pose questions about current transport and the future of transport. They can develop their own key questions to investigate or respond to one or more of the questions below. Students can complete the following KWLH organiser to explore their knowledge and consider what they would like to know and learn. Below are some possible questions for students to research.

What do I know?	***What do I want to know?***	***What have I learnt?***	***How will I find out?***

- How has transport changed over time in Australia? Research the history of transport and present your findings on a timeline.
- What are some of the fuels that vehicles use? Which fuels cause the most and the least amount of pollution? What is the best fuel for the environment?
- How do planes fly? Investigate what parts of the design help it to fly. Make your own paper plane or glider and experiment with wing shape to help it fly.
- What are the pros and cons of electric cars? Think of ways that electric cars can help people, the environment and/or the economy.
- How have cars changed since their invention? Explore the history of cars in more detail and create a timeline of significant events. Alternatively, choose another mode of transport to explore in more detail and plot your findings on a historical timeline.
- What is sustainable travel? Think of ways that you can be sustainable while travelling.
- Make a prediction about how transport will change in the future. Illustrate your predictions.

Activity

Drawing activity

Exquisite corpse is the most famous of all the surrealist games and was invented by Andre Breton and the surrealists in the 1920s. The surrealists were a group of artists and poets who loved breaking the rules of art and finding new ways to look at the world. Exquisite corpse is a method by which a collection of words or images is collectively assembled. Each collaborator adds to a composition in sequence, either by following a rule, or by being allowed to see only the end of what the previous person contributed.

In this activity students will use their imagination to illustrate a futuristic mode of transport using the exquisite corpse game. Working in groups of three students will use the following instructions.

How to:

1. Fold an A4 piece of paper into three equal parts.
2. The first person begins the drawing in the top third piece of the paper. Using a black tip pen, draw the top of a mode of transport – you can be as creative as you like! When finished, fold over the piece of paper so only the very edge of the drawing can be seen. This will help the next person know where to start their drawing.

3. The second person will then draw in the middle part of the piece of paper. Draw the middle section of a mode of transport – real or imagined. Then fold the piece of paper so only the very edge of the drawing can be seen. Pass it on to the next person.
4. The third person will draw in the bottom section of the piece of paper. Draw the bottom of the mode of transport.
5. NOW – SHARE!

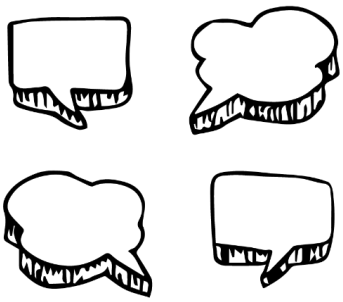
Reflect

Students will reflect on the activity by responding to the following questions:

- What did you enjoy about this activity?
- What did you find surprising?

Activity

Future of Transport



Before starting this activity, hold a class discussion, asking students what sort of transport they think they will be using in 50 years' time? Think about safety, environmental impact, sustainability, power sources and innovation.

In small groups, students will imagine they are engineers and design a new mode of transport or make a modification to a current mode of transport (e.g. to improve the design or function of a car). Ask students to respond to the following:

- How can transport be improved? For example, it could be more environmentally friendly, or it could be safer. What's the problem and what are some solutions to the problem?
- Write a brief for your design, using these headings as a guide: Background, Criteria, Your Challenge, Constraints.
- Sketch a drawing of the transport with labels to show its features – include a cross section and annotated diagrams to show materials.
- Choose a body size, engine size, fuel type and accessories.
- What is the source of power for the transport? Will it use green energy?
- What speed will the transport travel?
- What safety features does the transport have?
- What materials will be used to make the transport? Are they environmentally friendly?
- What are the interior and exterior features?
- What new technologies will you incorporate in your design?
- Who will use the transport?
- How will the transport benefit people?
- How will the transport benefit the environment?
- Why is your design the best one for your community?
- What is unique about the design?
- What inspired you to create your invention?

Presentation

Students will present their designs and share their ideas persuasively to the class. Encourage students to ask questions about their classmate's designs. Challenge students to make any improvements they can to their designs, to reduce the cost of travel or make it more sustainable.

Activity

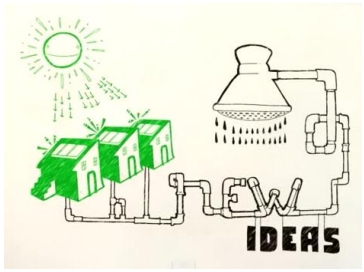
Sustainable transport

Students will think of ways they can improve transportation in their community. Students will look at how students get to and from school as a basis for their investigation. Before starting this activity, students will respond to the following questions (in small groups and then share their ideas with the class):

- What transportation in your community works well? How does it help people, the environment and/or the economy?
- What are some problems with transportation where you live?
- Look for inspiration in other places around the world. What do you like about the transport systems they use? Would it work where you live?
- How could you promote sustainable travel habits in your community?

Students will make improvements to the transport available in their community. Students' designs will need to include transport that uses alternative fuel sources, like solar energy and have an emphasis on pedestrians and bikes. Students may create a community where we can work, go to school and shop closer to where we live; create more bike lanes; have more people living closer together so they can support public transport and create safer streets to encourage walking and riding.

Watch this YouTube animation about climate change, energy and action to get your students inspired!



Useful Websites

Virgin Hyperloop claims world's first passenger ride on super high-speed system in Nevada
https://www.abc.net.au/news/2020-11-09/hyperloop-virgin-first-passengers-on-high-speed-system/12865148

Flying Cars – BTN
https://www.abc.net.au/btn/classroom/flying-cars/12625704

Driverless Cars – BTN
https://www.abc.net.au/btn/classroom/driverless-cars/10522100

Could supersonic ‘Hyperloop’ be our future transport? – Newsround
https://www.bbc.co.uk/newsround/23678271

Transport – ABC Education
https://education.abc.net.au/home#!/topic/1773359/transport