Waka Hiko Electric transport

What are the alternatives to fossil fuels?
Electric transport has much to offer but at what cost?

Focus

This set of resources will enable students to explore the impact of tech advancements on the physical and social environments.

Ākonga inquiries will explore the age of electric autonomous vehicles, considering the positive and negative outcomes of this technology.

Links

Technology in the New Zealand curriculum
Glossary of technological terms

Elderly Kaumātua	**Electric vehicles** Waka hiko	**Feed the team** Whangāia
Health Hauora	**Identity** Tuakiri	**Plastic** Kirihou
Rubbish overload Tūwhiti rāpihi	**Shelter** Tāwharau	**Transportation** Waka
Water Wai		

Horopaki Learning contexts

Choose a learning context:

Future of e-vehicles
With rapidly changing technology and lifestyles, we are seeing more electric cars and they are likely to become a dominant form of transport in the near future.

Life cycle of e-vehicles
Cars impact on the world around them, from their design, manufacture, use and disposal. We call this the 'life cycle'. When looking at the full life cycle of an electric vehicle there are some concerns, particularly around harm to the environment.

Autonomous vehicles
HMI Technologies and Christchurch Airport are conducting trials of driverless buses. These buses are expected to be safer than regular buses or taxis.

Design an icon
With the increase of electric vehicles and their benefits for the environment, many companies and councils are now providing charging stations for people to use. Where are these located and how do we access them?

Keen to find more resources? Go to the authentic curriculum resources on the Grow Waitaha website and select the Year 7/8 technology resources filter.

#growreallearning
#growcollaboration

The Context/Horopaki: With rapidly changing technology and lifestyles, we are seeing more and more electric cars and they are likely to become the dominant form of transport in the near future.

The Brief 1: *You are to research electric cars and answer the question—Are electric cars better than traditional fuel-based cars?*

The Brief 2: *You are to design and construct a vehicle that uses a rubber band or a balloon as the energy force.*

(WALT) We are learning to:
- **identify issues** with technology and justify decisions
- **explore** principles of aerodynamics

Activity 1 Research presentation

1. Watch video clips 1–2 to find information for your presentation. Take notes and answer these questions.
   - What are the key benefits of electric vehicles?
   - What are some questions or concerns you have about electric vehicles?
   - Who are the big electric vehicle manufacturers? How does this list compare to the big fuel-powered manufacturers?

2. Find a picture of an electric vehicle that you would most like to own.

3. Decide your viewpoint in regards to "electric vs fuel cars". Which are better? Why?

4. Present your findings using a tool like PowerPoint, [Powtoon] or [Prezi.] Remember to include your response to the question—*Are electric vehicles better than traditional fuel-based cars?*

5. Share your presentation with your kaiako.

Activity 2 Develop a car

1. Think about what happens if you open a car door in a strong wind. Look at the image below and think about why cars are shaped the way they are.

2. Watch video 3 to find out how to make a vehicle that is powered by a rubber band or balloon.

3. Use cardboard to construct a new car. Use cardboard only—<u>not </u>the bottle you saw in the balloon car video.

4. Complete three tests on a hard floor and measure how far your car drives.

5. Take a picture of your car and send it to your teacher. Tell them how far your car could travel.

Digital resources/Rauemi

1 NZ electric vs petrol cost comparison
https://www.youtube.com/watch?v=3gK9CCv44uA
2 Are electric cars really more environmentally friendly?
https://www.youtube.com/watch?v=0_RRKePSjL4
3 Build a simple balloon car
https://www.scientificamerican.com/article/build-a-balloon-powered-car/

Material resources/Rauemi

Cardboard
Balloon
Skewers
Bottle tops
Rubber bands

The Context/Horopaki: Cars have an impact on the world around them, from their design, manufacture, use and disposal. We call this the 'life cycle'. When looking at the full life cycle of an electric vehicle there are some concerns, particularly around harm to the environment.

The Brief 1: *You are to prepare a 'life cycle analysis' for an electric vehicle to evaluate its impact on the environment. You can choose any commonly used electric product such as a scooter, tram, e-bike, or car. Present your findings as a 1–2 page graphic, including pictures, diagrams and text.*

The Brief 2: *You are to come up with an innovative way of improving the end of life for your product—(upcycling, recycling).*

(WALT) We are learning to:
- **investigate and evaluate** a product's viability by completing a 'life cycle analysis'
- **explore** ways to upcycle products.

Activity 1 Life cycle of products

1. Choose an electric product to investigate—scooter, tram, e-bike, car.

2. Watch video clips 1–2 and answer the following questions:
   - What are some headings you could use to describe the different parts of a life cycle?
   - What are the key steps in the life cycle of your chosen electric product?
   - What are the key environmental problems your product is causing e.g. CO_2, wai (water), land pollution, electricity?

3. Find some images that represent each stage of the cycle.

4. Draw your life cycle analysis diagram and present this on 1–2 pages. You could use Microsoft Word or [Canva.](#)

5. Ask someone at home for feedback on your diagram. Can they understand it? Ask them for ideas to make it better.

6. Share your life cycle analysis diagram with your kaiako (teacher).

Activity 2 An advertising video

1. Research the following words. What do they mean in manufacturing?
   - upcycling
   - recycling

2. Come up with some innovative ideas on how your electric vehicle could be upcycled/recycled at the end of its life cycle. How could you reuse the materials and minimise damage to the environment?

3. Sketch your ideas. Write a brief advertising pitch to sell your new product and describe how it is going to help the environment.

4. Record your advertising pitch as a short 30-second video or sound recording.

5. Ask someone at home for feedback. Re-record your advertising pitch if necessary.

6. Share your recording with your Kaiako (teacher). Tell them one thing you like about your idea/video and one thing you'd like to improve.

Digital resources/Rauemi

1 Life cycle analysis
https://www.youtube.com/watch?v=-9JRowyICbo
2 The life cycle of a t-shirt
https://www.youtube.com/watch?v=BiSYoeqb_VY

The Context/Horopaki: HMI Technologies and the Christchurch Airport are conducting trials of driverless buses. These buses are expected to be safer than regular buses or taxis.

The Brief 1: *You are to research the benefits of driverless buses/shuttles and present your findings in a pānui (poster).*

The Brief 2: *You are to consider the purpose of the Ohmio driverless shuttle in the contexts of the airport and Aotearoa New Zealand, and come up with a creative name for one of the driverless shuttles. Create an animated version of the name that can be used for online advertising.*

(WALT) We are learning to:
- **explore** the impact of new technology on society
- **develop a design** that incorporates stakeholder needs.
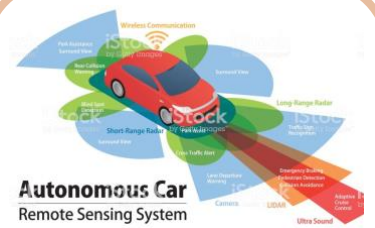
Activity 1 Poster presentation

1. Watch video clips 1–3 to help you answer the following questions. Make notes while you are watching.
   - How could a driverless vehicle be used to help travellers?
   - What concerns might people have about riding in a driverless vehicle?
   - What are some of the benefits of a driverless vehicle over a vehicle that needs a driver?
2. Use your answers to the questions to make a poster to promote the benefits of the Ohmio shuttle service at the Christchurch Airport. You can make a paper poster, or use [Canva](#) or [Adobe Spark](#) to develop your design. Think about how you can arrange the poster to best advertise the key benefits of the shuttle.
3. Share your poster with your kaiako (teacher).

Activity 2 Animate a name

1. Come up with a new name for one of the shuttles. Your name should incorporate some aspect of the shuttle and its relationship to Christchurch Airport. Come up with three names that younger children would enjoy, e.g. "Ben Bubbles", "Tumeke Mike", "Sporty Sophia", "Gorgeous George".
2. Get people at home to vote for their favourite name. Remember it is for children.
3. Choose one name. Follow the instructions in video 4 (below) to create an animation of your Ohmio name using Scratch. The animation should appeal to children and be relevant to the airport and product.
4. Show your animation to people at home and get feedback. If you have a Scratch account, share your project and send a link to your kaiako (teacher).

   Q. Have you worked out what the name Ohmio means?

   A. (HMI on wheels).

Digital resources/Rauemi
1 HMI Ohmio Christchurch launch self-driving vehicle
https://www.hmi.co.nz/en-nz/automated-vehicles
2 Ohmio driverless buses
https://ohmio.squarespace.com/news
3 Benefits of driverless cars
https://www.youtube.com/watch?v=TQYdhSBLnnE
4 Animate your name with Scratch
https://scratch.mit.edu/help/studio/tips/howto/nametip-intro/

Material resources/Rauemi
If you choose to create your pānui/poster by hand, you will need:
Paper
Coloured pens/pencils

The Context/Horopaki: With the increase of electric vehicles and their benefits for the environment, many companies and councils are now providing charging stations for people to use.

The Brief 1: *Develop a simple but bold icon that can represent a charging station for electric vehicles.*

The Brief 2: *Develop an interactive map of charging stations in your local region. Add the icon you made so that the map is clear and easy for electric vehicle owners to follow.*

(WALT) We are learning to:
- **use simple pixel** art to create a visual icon
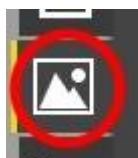- **create** interactive maps.
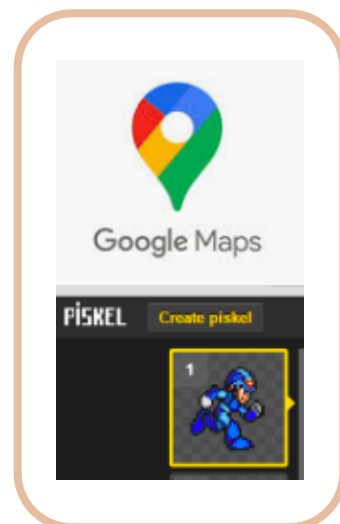
Activity 1 Create a pixel art icon

1. Watch the PisKEL app tutorials (below) to get started with pixel art.

2. Design your own original icon for an electric vehicle/charging station using PiSKEL. Go to https://www.piskelapp.com/. The image below shows one option for an electric vehicle icon.

3. Download your file as a .png file by using the *Export* button. It will go to the download folder on your computer.

Activity 2 Make an interactive map

1. Use this map to find electric charging stations near you.

2. Use Google Maps https://www.google.co.nz/mymaps/ to create a map of EV charging stations in your local area. Watch Video 2 to see how to make a map. Alternatively, use Google Earth or pen and paper.

3. Use the following sequence in Google Maps to make your pins unique with your PiSKEL file from Activity 1.
   - When you have pinned a spot, click on the paint tool.
   - Click on "custom icon".
   - Find and upload your icon.
   - Click on "OK".

   Here is a simple example.
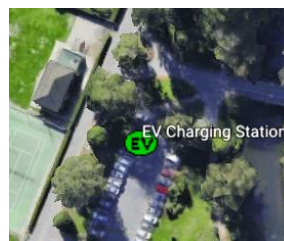
4. Add any other points of interest to the map such as playgrounds or swimming pools. Give your map a title and it will be automatically saved to Google Drive.

5. Share your map with your kaiako (teacher).

Digital resources/Rauemi
1 PiSKEL app tutorials
https://www.youtube.com/watch?v=VMkvVmAQBd0
2 Creating maps in Google Maps
https://www.youtube.com/watch?v=Bz2Ohi16ED8
3 Charging electric cars
https://www.youtube.com/watch?v=327u8_VporE