

MOVE IT! EXPLORING SUSTAINABLE

Teacher/Facilitator Guide **TRANSPORT**

A Year 5-8 inquiry learning programme for Canterbury schools



**Environment
Canterbury**
Your regional council

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SUSTAINABLE TRANSPORT: AN INTRODUCTION

Why Move It?

The *Move It* inquiry unit is designed to identify local transport issues and place these within the wider global context of sustainability, enabling students to develop an active transport plan for their school and recognise that their actions can make a difference to the environment. Working with an Environment Canterbury facilitator, teachers can tailor the unit to:

- provide an authentic context for a social action inquiry process
- build links with the school community
- develop a travel plan for active transport which contributes to protecting the environment, physical wellbeing and student safety
- explore the future focused issue of sustainability
- explore values development of key competencies within the future focused contexts of sustainability and citizenship.

Transport is an environmental issue particularly suited to inquiry learning approaches, and to individual and group action. Transport is a fact of everyday life; almost every day we travel somewhere. There are many opportunities for students, as for all of us, to look critically at transport options and to consider environmental outcomes when deciding how to travel.

The environmental effects of transportation are both global and local. Transport emissions, especially from private cars, contribute to **greenhouse gas emissions**. Motor vehicles also degrade local air quality, particularly in areas with high traffic, and add to visual and noise pollution in our cities and towns.



As well as causing environmental pollution, our reliance on oil-fuelled private cars is not **sustainable** (that is, it cannot carry on into the future). **Peak oil** is the term used to describe global oil production reaching its maximum output, then beginning to decline. Most energy experts believe the peak will occur inside the next decade; some data suggests that production may have already peaked.

If demand for oil products keeps growing while supplies remain constant or fall, prices will rise and oil shortages may occur.



Making greater use of **sustainable transport** modes of transport that do less damage to the environment and are less dependent on oil is therefore vital. Here in Canterbury, our mild climate and largely flat terrain are favourable for **active transport** walking and cycling especially for shorter journeys (under two kilometres for walking and under six kilometres for cycling).

In addition, Christchurch and Timaru enjoy the many benefits of the **Metro bus system**. Public transport is cheap, convenient and easier on the environment, and allows us to make car-less journeys anywhere across the city.

It is against this background that children make their way to school. A school's transport footprint can make up a large part of a community's energy use and emissions, as any comparison between term-time and school-holiday traffic levels will confirm.

➔ *Move It* aims to engage you and your students with the environmental, social and economic issues of transport. The programme will immerse students in the challenges that we all face in limiting greenhouse gases and planning for a future beyond cheap oil. By exploring solutions based on active transport and public transport, students will create and implement a plan to lower their school or community's transport footprint and take action for a better environment.



Environment Canterbury's Community Plan 2009-2019 commits to:

- providing public passenger transport and encouraging people to use it to reduce the growth in traffic congestion
- promoting the use of walking, cycling, public transport and carpooling.

The *Move It* transport education programme is part of an identified activity in the Community Plan: Communicating, educating and advocating: provide passenger transport education programmes in primary and intermediate schools in Christchurch and Timaru.

Environment Canterbury is responsible for public passenger transport and for long-term planning for regional land transport. This work contributes to the following Community Outcomes.

- Ensuring that transport and travel needs are met.
- Ease of travel around cities and towns and easy access to shops and other community services.

HOW THE MOVE IT PROGRAMME OPERATES



Move It:

- is designed for upper primary and intermediate students (Years 5-8)
- is based around inquiry learning principles and learning objectives from levels 3 and 4 of *The New Zealand Curriculum*
- provides a real-world learning context for an inquiry approach, ideally over a whole school term
- includes sessions run by the ECan facilitator and the classroom teacher.

The purpose of the Move It programme is to enable students to investigate:

- the types of transport we use to move people around our towns and cities, and their social and environmental effects
- the energy sources used for this transport and how they might change as oil becomes less available
- how public transport and active transport can help reduce CO₂ emissions and local air pollution, and how they might help create more attractive and less congested streets in our towns and cities
- using bus services and active transport facilities in our communities and planning viable improvements so that more people want to use them.

Move It asks students to create and implement a plan of action to increase the use of sustainable transport in the school community. The project is open-ended. The facilitator and students set their own outcomes and determine the best ways to achieve them.

INQUIRY LEARNING

Move It is structured as a social inquiry learning programme. Using a social inquiry approach:

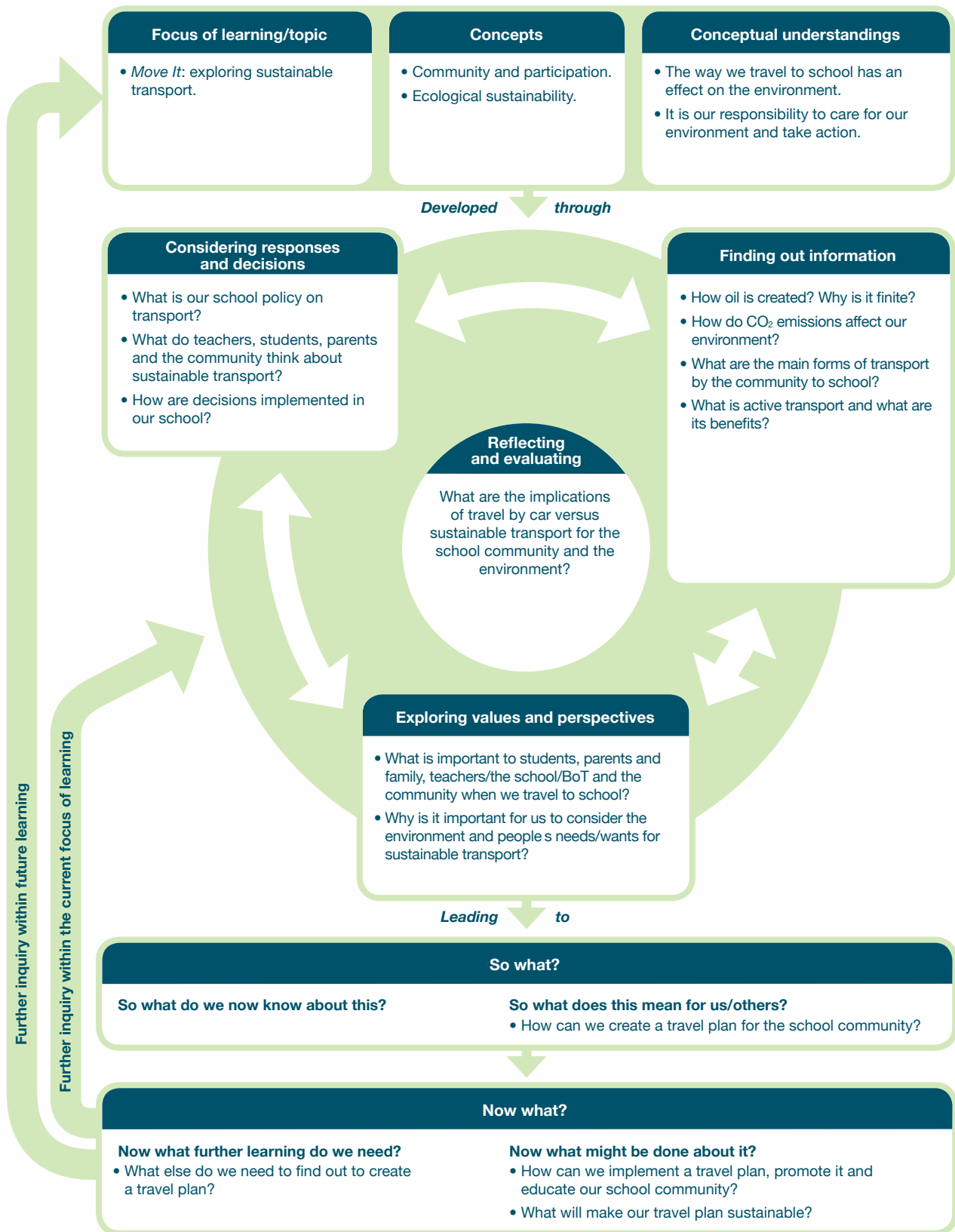
- encourages students to formulate their own questions in a chosen area of study, gather information and background ideas, and examine the relevant current issue of sustainability
- enables students to explore and analyse people's values and perspectives
- allows students to consider the ways in which people make decisions and participate in social action
- helps students to reflect upon and evaluate what they have learned, and to generate ideas for further study and/or action based upon their learning.

After the focus of learning has been explored the students move into the action phase with the 'So what?' and 'What now?' questions. The *Move It* programme's ultimate aim is for your students to create and implement their own plan of action to increase the use of sustainable transport in your school community.

The diagram on the next page (taken from a social inquiry overview diagram published in *Approaches to Social Inquiry* from the *Building Conceptual Understandings* in the Social Sciences series) depicts a social inquiry approach that you could use or adapt.



SOCIAL INQUIRY MODEL



Interactive social inquiry planner: <http://socialinquiry.ssol.tki.org.nz>

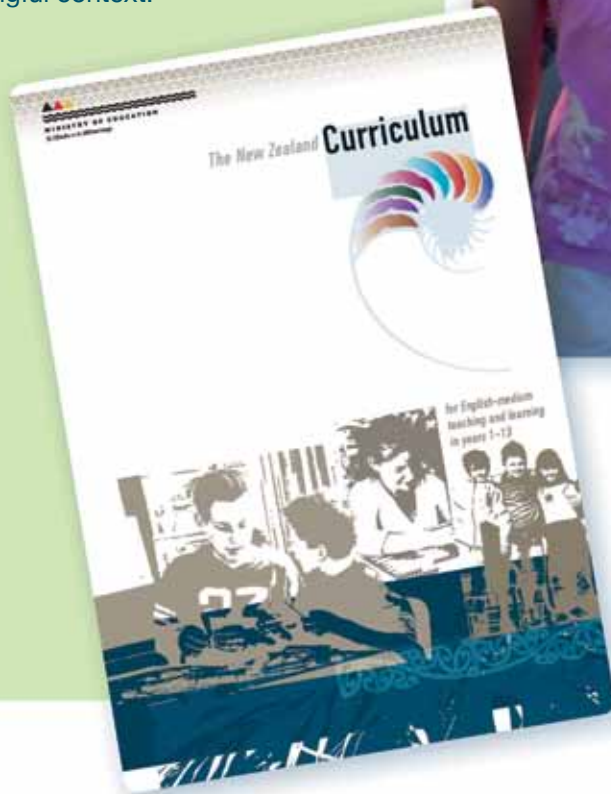
This template is taken from a social inquiry overview diagram originally adapted from B. Hill and G. Aitken's social inquiry model for the Ministry of Education, and published in *Approaches to Social Inquiry* from the *Building Conceptual Understandings in the Social Sciences* series (Ministry of Education, 2008).

MOVE IT AND THE NEW ZEALAND CURRICULUM

The 2007 revision of *The New Zealand Curriculum* gives strong support to inquiry-based learning and to involving students in the future focused issues of sustainability and citizenship.

Students explore the impact of different methods of transport on the environment and identify how they can contribute to the development and well-being of society through conserving the finite resources, reducing carbon emissions and developing sensible and safe and sustainable practices for travelling to school.

This inquiry-based unit provides students with an authentic context within which they can explore their own and others values on ecological sustainability and community participation. The unit provides learning experiences which will enable the development of the key competencies in a meaningful context.



ASSESSMENT

The primary purpose of assessment is to improve students' learning and teachers' teaching.¹ With this in mind, teachers will need to consider with students what their particular focuses are when teaching the unit. This may include development of knowledge, competencies and values.

Key elements of formative assessment include:

- the identification by teachers and students of learning goals, and criteria for achieving these
- rich conversations between teachers and students that build and go deeper, enabling development of knowledge, competencies and values
- the provision of timely feedback to enable students to advance their learning
- the active involvement of students in developing their own questions for inquiry, and the process they work through to locate, process and analyse information to answer these
- teachers responding to identified learning needs and strengths by modifying their teaching approach(es).²

Throughout *Move It* there are suggestions for formative assessment including identifying prior knowledge, recording of understandings on displays, organising and grouping ideas, providing students with clear criteria of what is required from the final presentation, and scheduled checkpoints where students discuss their research with the teacher.

Summative assessment of knowledge can be gathered in the final session.

1 Ministry of Education (2007). *The New Zealand Curriculum* pg 39. Learning Media, Wellington

2 Te Kete Ipurangi. Formative assessment. Assessment: Teaching and learning. www.tki.org.nz/r/assessment/one/formative_e.php

UNIT OVERVIEW OF MOVE IT SESSIONS

This unit encourages students to look to the future by exploring the significant future focused issues of and .

This resource is based around students developing and exploring the following values:

- | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Set personal goals to support development of active and sustainable transport. • Manage time effectively to complete tasks. | <ul style="list-style-type: none"> • Work with others to plan and achieve shared goals. Includes: <ul style="list-style-type: none"> - sharing ideas - listening to others - agreeing tasks - identifying skills and using them to support the group. | <ul style="list-style-type: none"> • Make decisions about sustainable transport actions in the community. • Support actions agreed upon to develop sustainable transport. | <ul style="list-style-type: none"> • Gather, organise, present and analyse data to inform planned actions. • Use scientific terms and language to describe sustainability. | <ul style="list-style-type: none"> • Develop understanding of sustainability, how to raise awareness of the issue and values around the issue. • Critically analyse information, distinguish between fact and opinion. • Use thinking tools to organise ideas, and analyse information. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Social Sciences

- Relationships between people and the environment.
- Consumption and production affect communities.
- L3 – Understand how people make decisions about access to and use of resources.
- L4 Understand how people participate individually and collectively in response to community challenges.
Understand how exploration and innovation create opportunities and challenges for people, places and environments.

Science**• Earth systems**

- L3 Appreciate that water, air, rocks and soil, and life forms make up our planet and recognise that these are also Earth's resources.
- L4 Develop an understanding that water, air, rocks and soil, and life forms make up our planet and recognise that these are also Earth's resources.

Health and Physical Education**• Societal attitudes and values**

- L3 – Identify how health care and physical activity practices are influenced by the community.
- L4 – Investigate and describe lifestyle factors and media influences that contribute to the well-being of people in New Zealand.

• People and the environment

- L3 – Plan and implement a programme to enhance an identified social or physical aspect of their classroom or school environment.

• Rights, responsibilities, and laws; people and the environment

- L4 Specify individual responsibilities and take collective action for the care and safety of other people in their school and in the wider community.

Mathematics and Statistics

- L3 – Plan and conduct investigations using the statistical enquiry cycle:
 - gathering, sorting and displaying multivariate category and whole number data and simple time-series data to answer questions
 - identifying patterns and trends in context, within and between data sets
 - communicating findings using data displays.

English

- L3 and L4 – Integrate sources of information, processes and strategies with developing confidence to identify form and express ideas.

Students will:

- explain the difference between finite and renewable resources
- describe some of the effects that different types of transport have on the environment and society
- identify a sustainable transport option for the school community and provide reasons for its use that demonstrate their understanding of the benefits to themselves and the environment
- plan and implement a sustainable transport action plan for students to get to and from school.

Session 1: Ignite the inquiry

Session 1a: Compare active transport vs car dependence

Session 2: Focus the inquiry

Session 3: Build vocabulary

Session 4: Find out the facts

Session 5: Gather transport information

Session 6: Explore transport options

Session 7: Explore values

Session 8: Gather data

Session 9: Analyse data

Session 10: Map ways to and from school

Session 11: Plan for action

Session 12: Develop the action plans

Session 13: Present the plans

Some of these activities may be split into two.

There are suggested extension activities to enrich the learning.

ASK
ECAN

Where you see this symbol through the text, the ECan educator can supply hard copies of the described resource, and loan out a class set if required.

LESSON PLAN SESSIONS



IGNITE THE INQUIRY

Facilitated by the ECan educator

Learning intention

Students will:

- understand what a finite resource is
- identify the effects of cars on the environment including:
 - congestion
 - using oil, a finite resource for power
 - causing pollution including CO₂
- be introduced to the big question: 'How can we use less oil, make less pollution, and make our roads safer and less crowded?'



Teacher information

Delivery of sessions 1 and 1A should be negotiated with the ECan educator, as they can be done as:

- two sessions in the classroom
- combined as a single session delivered to a syndicate.

Equipment and resources

- *Move It* PowerPoint
- Computer and data projector

Learning sequence

1. Show the PowerPoint to students. Provide students with purpose for watching things to look for and responses. Stop at:

- Slide 13. Ask: 'What would the alien think about our city/world from these slides?'
- Slide 19. 'Maybe the alien would think that cars were the main life-form on Earth, and that human beings were mobile fuel cells that jump in when the car needs to go somewhere, and pop out again once the car has stopped.'

Ask the students to discuss the alien idea with a partner: What do you think of the idea? Do you agree/disagree? What other ideas does it make you think of? What are your impressions of cars and the environment?

- After the next three slides, discuss:
 - imagine some extreme situations
 - every journey by car
 - no cars anywhere, ever .

Discuss/reflect in pairs or threes using thinking hats, good points/bad points/creative ideas:


- with every journey by car: What would it be like for people, for the environment?
- with no cars anywhere ever: What would it be like for people, for the environment?
- Slide 24. Ask: 'Do we have the right balance?' 'How can we find out?' 'What problems are caused by having too many cars?'

2. Ask students to identify some of the issues associated with over-use of cars.

- Congestion — taking up of space (Slide 25). Discuss and relate to students' experience, especially around the school gate:

- Oil is a finite resource.
- What powers cars? (Slide 31)
- How is oil formed? (Slides 32-33). Discuss what a finite resource is, why oil is finite, and that one day it will be gone.

- Pollution — cars and pollution (Slides 35-38). Discuss the pollution coming from cars, what CO₂ does, and the other toxins that cause health problems. Select a short

 video from YouTube to assist with this, such as: www.youtube.com/results?search_query=car+pollution&search_type=&q=f

- (Slide 38) Pose the big question. 'How can we:
 - use less oil
 - make less pollution
 - make our roads safer and less crowded?

Students discuss and teacher records ideas.

Session 1 could be split here.

COMPARE ACTIVE TRANSPORT VS CAR DEPENDENCE

Facilitated by ECan educator

Learning intention

Students will:

- know what active transport is
- identify different methods of active transport
- compare active transport with car dependence.

Learning sequence

1. Revise the previous session and review the key points from the PowerPoint:

- Oil is a finite resource that cars are using up.
- CO₂ emissions from cars are causing greenhouse effect (climate change).
- Cars are causing congestion.
- How can we use less oil, make less pollution and make our roads safer and less crowded?

2. Show the PowerPoint from Slide 38 with the big question. After looking at slides 39-44:

- Ask students to define active transport. Create a class definition.
- Ask students to suggest types of transport in/on which they would save oil and create less CO₂ emissions while travelling to school. Use students suggestions to create a class list (include transport by bus if practical).
- Show the video clip www.youtube.com/watch?v=guodaBkDPP0 to explore the role of buses in creating sustainable transport.
- Create a PMI chart on active transport. Students can brainstorm the benefits/minuses of active transport in small groups. Questions to help their thinking include:
 - What effects does it have on the environment?
 - What effects does it have on health?
 - What effects does it have on safety?
 - 'What are the obstacles/difficulties?'



3. Create a T-chart on car dependence:

Use the T-chart to assist in deciding:

- When should you use a car?
- When should you use active transport? Guide students toward identifying that short trips (such as getting to school) are suitable for using active transport.

Extension and enrichment lesson plans

- *Transportation and culture activity* (page 46)
- *Strife in Bussville* (page 49)

FOCUS THE INQUIRY

Facilitated by teacher

Learning intentions

Students will:

- develop an awareness of the knowledge required to answer the key question: How can we use less oil, make less pollution, and make our roads safer and less crowded? , including:
 - understanding that CO₂ emissions trapped in the atmosphere cause climate change
 - understanding that cars produce CO₂ emissions
 - identifying some effects of climate change
 - identifying some things they could do to reduce their carbon footprint.
- generate and organise questions for inquiry.



Learning sequence

1. Present the big question. In the context of transport, how can we contribute to a sustainable environment? How can we use less oil, make less pollution, and make our roads safer and less crowded?
2. Find out what students know already (prior knowledge), through a class discussion, voice-thread (<http://voicethread.com/#home>), recording statements or responses to questions, group brainstorm, set of questions displayed and students record their thoughts below these, or a postbox activity. Ask: What is meant by sustainability? Is it important? Why are people talking about it? How will it affect your future? What is your carbon footprint?



3. Show Years 5/6 www.youtube.com/watch?v=zzjOcOcQ90U. Ask students to record on *Template 1: Our carbon footprint:*

- some of the effects of climate change
- the causes of the gases
- the solutions they can see.

You Tube or show Years 7/8 www.youtube.com/watch?v=oJAbATJCugs&feature=fvw. Ask students to complete *Template 2: Greenhouse effect* to identify:

- the factors causing global warming
- the long term effects
- the things they can do to help make a change.

4. Generate a class brainstorm around the big question which organises students' ideas, understandings and further questions for inquiry from Session 1, the video clips and their prior knowledge. Keep this as a record on the wall or as part of a learning journal and add to it throughout the unit to track learning.

Resources

- *The greenhouse effect just hot air*. School Journal Pt3 No1 1994
- www.coolclimate.org/simplyscience.htm
- www.bbc.co.uk/climate/evidence/greenhouse_effect_img.shtml
- www.sciencemuseum.org.uk/exhibitions/energy/site/EIzInfo9.asp

Extension activity

- You Tube**
- Explore climate change issues by watching Al Gore's movie *An Inconvenient Truth*, or the movie trailer on YouTube: www.youtube.com/watch?v=0XMn_Ry3z6M.
 - *Climate Crisis* www.climatecrisis.net is the official movie site for *An Inconvenient Truth*. It contains a teacher's guide to using the movie to help students understand what climate change is and how they can make a difference. This unit is aimed at American grades 9-12. www.takepart.com/downloads/aninconvenienttruth_studyguide.pdf
- You Tube**
- Explore peak oil issues by watching the first 3 minutes of the movie *A Crude Awakening* on YouTube: www.youtube.com/watch?v=6HRZPpbbSjg.

BUILD VOCABULARY

Facilitated by teacher

Learning intentions

Students will:

- develop an understanding of vocabulary and terms related to sustainability.

Teacher information

These activities can be done as stand-alone activities or as part of the reading programme.



Learning activities:

Choose some of the definitions from *Template 3: Glossary* to use in the following activities.

1. Write the terms on sheets of paper or use a data projector to display them. Students suggest or predict meanings. Record predictions and revisit during the unit to make appropriate changes.
2. Use glossary terms for spelling lists during the unit.
3. Enlarge the glossary page and cut terms and definitions into separate pieces. As students become more familiar with the terms, get them to match terms with the correct definitions. Time how long this takes – can students beat their previous best times?
4. Play an adaptation of Balderdash using terms from the glossary. Refer to link for instructions on how to play: <http://en.wikipedia.org/wiki/Balderdash>
5. Design a word cloze activity using glossary terms.
6. Design a crossword using the glossary terms. You could use a computer program such as:
 - www.eclipsecrossword.com
 - <http://createfreecrosswordpuzzle.34815.free-press-release.com>
7. Make additions to the glossary as you research your inquiry.

8. Play *Glossary Loopy* (Template 4).

- Cut out the cards.
- Students stand in a circle.
- Distribute cards randomly round the circle – one per student.
- Student with the smiley face at the top of their card starts by reading ‘I have the smiley face, who has .
- The person with the answer to that definition continues in the same way, reading the top of their card (or answer) then the bottom.
- The game is finished when the loop is completed with the smiley face.
- Teacher or extra students can have a loopy master to police the game and make sure the correct responses are given.

9. Create poetry writing activities (for example, acrostic, shape or pivot poems) with the glossary terms.

FIND OUT THE FACTS

Facilitated by teacher

Learning intentions:

Students will:

- identify information required to answer inquiry questions
- locate, gather and process information to answer inquiry questions including:
 - explaining how CO₂ emissions from cars affect the environment
 - explaining how oil is formed, what a finite resource is, and the impact of oil use on the environment
 - identifying types of active transport and explaining their benefits
- communicate ideas and information, clearly integrating both oral and visual language.

Teacher information

Teachers may wish to do this by:

- using one session for research and then setting a homework assignment
- doing the work in the classroom over two sessions
- carrying out the research as part of Session 11.

Learning sequence

1. Refer to the class brainstorm generated in Session 2. Pose the additional questions: 'Why do we need to make changes to the way we travel to school? What background information do we need to find out?' Remind students that this information will help with planning for change to answer the big question. Add and organise new questions for inquiry to the brainstorm.
2. Students carry out individual or small group (2-3) research on one of the questions from the brainstorm. For example:
 - How using cars affects the environment, including:
 - CO₂ emissions on the environment
 - road casualties
 - money spent on fuel.
 - Bus transport: Is this utilised? Is it viable? Look at the Metro Map. Identify types of buses used (students could look at the Christchurch Shuttle).
 - How oil is formed, why it is a finite resource and the impact on the environment.

- Different types of active transport: What is required? How they have been implemented in other schools? What are the benefits of these to students and community?
3. Students present the information orally to the class, supported with a poster or PowerPoint presentation. This information will be used to inform the decision making process and action planning. This is an opportunity to practise for the final presentation later in the unit. Provide students with success criteria for both good speaking and content.

Suggested sources of information

- Environment Canterbury Ebox



Note: The ECan educator can supply hard copies of these resources, and loan out a class set if required.

- *On the Move*. The impact of transportation on the natural environment, energy sources, the different ways we travel or could travel and potential actions we could all take to be more active and sustainable when it comes to getting ourselves from A to B.
<http://ecan.govt.nz/publications/General/eBoxTransportOnTheMoveApril09.pdf>
- *A Changing Climate*. Explores climate change's global implications, looks at what it means for New Zealand and Canterbury, how it will affect people and the environment, and what we can do about climate change.
http://ecan.govt.nz/publications/General/Ebox_CLIMATE_Aug08.pdf
- *Transportation Energy*. The text is aimed at Years 7-8. Although the examples are American, they cover the range of transport fuels extremely well. Check out How much it takes to make a gallon of gas .
www.energyquest.ca.gov/transportation/index.html
- The Christchurch Shuttle — why it was introduced, how it operates, the benefits.
www.nzine.co.nz/features/designline3.html
- Designline Buses produce the electric hybrid shuttle buses that operate a free service in central Christchurch.
www.designline.co.nz/
- *Energy Story*. Explains how oil is created and refined.
www.energyquest.ca.gov/story/chapter08.html
- *Energy Kids Page*. Explains how oil is formed, refined, what it is used for, and the impact on the environment.
www.eia.doe.gov/kids/energyfacts/sources/non-renewable/oil.html
- Environment Canterbury's *Beat the rush*. An intermediate school resource with great graphics and music, designed to encourage public transport use and to inspire students to make smart choices about energy use.
www.ecan.govt.nz/advice/your-school/games-movies/pages/beat-the-rush.aspx

- *The Walking School Bus*. The New Zealand Transport Agency's brochure explaining what a walking school bus is and why it is a good idea.
www.landtransport.govt.nz/travel/school/walking-school-buses/docs/walking-school-bus-brochure.pdf
- *Stuff* editorial about fuel tax reversal debate or discussion starter.
See: www.stuff.co.nz/the-press/opinion/editorials/2271007/Fuel-tax-reversal
- articles and slideshow about people walking and cycling across the Auckland Harbour Bridge in May 2009.
See: www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10574281 (article)
www.nzherald.co.nz/nz/news/image.cfm?c_id=1&gal_objectid=10574283&gallery_id=105770 (photo slideshow)
- Resources: School Journal stories (page 42)
- National Library – see *Printed Resources* for suggested titles (page 43)

Extension and enrichment

Lesson plan: *Research Riding the buses!*
(page 47)



GATHER TRANSPORT INFORMATION

Facilitated by teacher

Learning intention

Students will:

- describe some of the social and environmental issues that occur as a result of modern transport.

Resources

- *On the Move*: <http://ecan.govt.nz/publications/General/eBoxTransportOnTheMoveApril09.pdf>
- *On the Move* references: <http://ecan.govt.nz/publications/General/TrackedReferencesTransportEbox.pdf>
- *Template 5: Transport facts*

Learning sequence

1. Put students into small groups. Provide each group with transport facts from *Template 5: Transport facts sheet* (each fact laminated separately). Depending on the reading level of the students, they could also look through *On the Move*. Allocate one or two pages to groups of students to read, before pulling out key points.
2. (Years 5/6) Create quiz questions from the facts (or allow students to do so) which other students answer.

or

(Years 7/8) Provide students with scenarios and get them to organise the facts using T-charts (for and against) to prepare quick debate sessions. For example:

- 'Travel by car is necessary.'
- 'Active transport is good for your health.'
- 'We should be saving our finite resources.'
- 'Students should not come to school by car.'
- 'Travelling by bus is a good way to come to school.'

Students organise their facts into for and against. Split the class in half and instruct students to present their arguments using the facts. Keep these short. Change which half of the class is for and which is against with each scenario.

EXPLORE TRANSPORT OPTIONS

Facilitated by ECan educator

Learning intention

Students will:

- identify their own and others' values of different methods of transport to school
- recognise the impact oil based transport is having on the environment.

Learning sequence

1. Ask the students: How did you come to school today? Create a class graph using sticky notes on the white board. Answers could include:

- by walking
- by car
- by bus
- by taxi
- by bike
- by scooter
- by roller blade
- by other means.

Teachers may wish to record this data on a spreadsheet so students can create more formal graphs with further analysis after the facilitator session is complete.

2. Identify the proportion of the class involved in active transport and those coming in cars.

3. Brainstorm a list of all the different possible methods of transport. Ask students to rank their preferred method. This can be done using sticky notes and comparing them to the graph of how students came. Discuss similarities and differences.

4. Use de Bono's yellow, black and green thinking hats (*Template 6: Changing methods of transportation*) to explore changing people's methods of transportation. Ask: Why do people travel the way they do? What are the barriers to change? How can we get people to change? Explore good points and obstacles to using different methods of travel and new ideas to overcome barriers.

or

Ask students to each pick a random card from *Template 7: Discussion cards* and discuss in pairs for two minutes.



5. Ask students in pairs to use Google Maps to find the distance from their house to school and back each day. Calculate the number of kilometres per year for each student, and then add these up for a class total.

Use the CarboNZero school calculator to work out CO₂ for transport and identify carbon emission they are putting into the atmosphere with their travel.

www.carbonzero.co.nz/calculators/school_emissions_calc.asp#

Calculate the cost of fuel for the whole class. Use the tables at <http://fuelsaver.govt.nz> to help. You might want to use an 'average car' figure for fuel consumption rather than working out each family's car individually.

6. Ask: What problems are there at school around transportation (for example, congestion with cars)? How can we engage our community?
7. Add the findings to an inquiry display or students' learning journals.

EXPLORE VALUES

Facilitated by ECan educator and/or teacher

Learning intentions

Students will:

- identify and explore their own and others' values around transport to and from school
- gain an understanding of how values influence decisions.

Teacher information

This session could be split into two lessons, the ECan educator starting the first session and the teacher continuing with the second session.



Learning sequence

1. Refer to previous lesson. Ask: How can we conserve oil and reduce CO₂ emissions?
Lead students toward identifying reducing car travel and becoming more active. Explain and discuss that they will create and implement a plan to reduce car travel to and from school (and thus to help solve some of the big issues they have been studying).
2. Discuss as a whole class:
 - 'What is important to us about travel to and from school, so that we have an overall goal/vision for our plans to work towards?
 - 'Who is involved/affected (for example students, parents/families, teachers, principal, BoT, the community, the environment)? List these on the board. These are the stakeholders.
 - 'What are some possible important factors/values that matter to us?' There are some listed already on *Template 8: Important factors when travelling to school* and some blank spaces to add in new ones.

Keep this discussion short as a model for the group work.

3. Divide the class into groups of three or four. Give each group the following resources:

- *Template 8: Important factors when travelling to school* (two copies)
- *Template 9a: How students travel to school worksheet*
- and one sheet per group of either:
 - *Template 9b: Parents/family/whanau*
 - *Template 9c: Teachers/school*
 - *Template 9d: Community*
 - *Template 9e: Environment.*

Each of the four stakeholders is looked at by one or more groups.

This activity may need to go on to a second session. Stop the students after they have completed the first page *Template 9a: How students travel to school*. Complete the activity with the stakeholder page from the list above in a second session.

Ask students to discuss and rank the values in priority on each of their two worksheets. Place the values onto the sheet in order, most to least important.

Allow groups to share their work with the whole class. Record the top three from each group to clearly show the top shared values across the class.

Supporting reading activity

Template 10: Related School Journal reading activities

GATHER DATA

Facilitated by ECan educator

Learning intention

Students will:

- create a survey to gather information.

Teacher information

- This may take more than one session.
- Teachers need to consider whether:
 - the survey is created online using a tool such as Survey Monkey www.surveymonkey.com or on paper
 - they also do a foot count at the school gate
 - the depth of the inquiry and social action means they are surveying students within the school or creating a separate survey for the parent community?
- Contact your local council to find out what support they can provide with school travel planning. For Christchurch City email roadsafetycoordination@ccc.govt.nz or phone 941-8299.
- The principal and BoT will need to be involved at this level and the results will be presented to them in Session 13.
- ECan is able to supply staff to input raw data and provide schools with data in tables and graphs from the parent survey, which can then be analysed by students.



Learning sequence

1. Restate the values from last session. Model use of the action plan (*Templates 11 and 12*) with the whole class. Set a goal, for example reducing car trips to and from school and increasing shared and active transport trips.
2. Ask: What is our plan going to try to achieve, and what information do we need to gather to help us with our plan? What do we need to find out to help us achieve our goal? Who do we need to ask? How will we ask them (written family surveys, class surveys, questioning etc)? Will the time of year make a difference (summer and winter transport)?
3. Look at models of previous surveys (*Templates 13,14*). Begin to design a survey with questions to obtain the information needed. This should include:
 - where they live
 - how they currently travel
 - why they travel the way they do
 - if they have considered walking, bike, bus and so on.
4. Decide how the surveys are to be carried out: paper or online. Distribute the surveys to class teachers to carry out with their classes and give a date for completion.

Once this information has been gathered it will be used to inform the action plan. Students/teacher will identify ideas which can be investigated to implement, including walking school buses, scooter parks, park and walk points and so on.



ANALYSE DATA

Facilitated by teacher

Learning intention

Students will:

- gather, sort and display data
- identify information to assist in action planning
- communicate findings.

Teacher information

- This could be integrated into a maths session.



Learning sequence

1. Introduce the classroom organisation and demonstrate how to enter data and create graphs from a spreadsheet.
2. Ask students to work in groups to enter the survey data onto a spreadsheet. This will need to be part of a rotation, as data from all the surveys will need to go onto one spreadsheet. Once data is entered create graphs for each question.

or

Ask students work in groups to create graphs from the online survey.

3. Ask students to make statements from the graphs about the information they show. This may be done as a whole class or group activity. It can be presented as part of the inquiry display or in students learning journals.

MAP WAYS TO AND FROM SCHOOL

Facilitated by ECan educator

Learning intention


Students will:

- develop an understanding of the action plan process through:
 - gathering and displaying data
 - identifying patterns
 - using data to inform decision making.

Teacher information

- This may take more than one session.
- Teachers will need to have survey data collected from other classes before being able to complete the large map showing results from other classes in the school.

Learning sequence

1. Ensure that students have their completed surveys from the previous session.
2.  The ECan educator will supply a large planning map of the school and surrounding area, made up of several A0 sheets mounted on soft board. The map shows street names and numbers, plus aerial photos of houses and so on.

Ask students to mark their houses with a coloured pin according to whether they walk, bike, scooter, are driven etc. This will give an idea of the distribution of where students live and how they travel to school.

The same map will be used by each class in the syndicate studying *Move It*. Information from other classes surveyed can also be displayed on the map.

3. Analyse the data from the surveys and map to:
 - identify possible means of transport
 - identify clusters of students with similar means of travel.
4. Brainstorm some possible ideas to reduce car trips to and from school (and to address safety, fitness and pollution). These could include a walking school bus, scooter parks, park and walk points, school bus routes and so on.
5. Ask students to individually list on sticky notes three good ideas for reducing car trips. Ask them to explain their best idea in more detail (why it is a good idea, and how it would be implemented). Collate and organise their ideas into categories for the class to work on in groups in the next session.
6. Put the ideas onto the class action plan.

You can also use Google Maps for this activity, either prior to the lesson or afterwards if time is running out.

PLAN FOR ACTION

Facilitated by teacher

Learning intention

Students will:

- gain an understanding of how to create an action plan for active transport to school.

Learning sequence

1. Organise students to work in small groups. Explain that each group will select one of the categories of ideas from the previous session, for which they will be developing an action plan over the next few sessions. Discard or merge any categories that no-one wants to work on. If one idea is over-subscribed, have two groups look at different aspects.

Suggested ideas could include:

- drop off zones
- car pooling
- walking school bus
- scooters, rollerblades, skateboarding
- education of the community on sustainability
- promotion of how to encourage less cars in the school community
- road safety issues concerning the school community.

In some classes there might be a single plan for the whole class, with different aspects that groups work on. For example, everybody might be working on creating walking school bus routes or on ideas for dealing with a troublesome intersection near the school.

Other classes will have multiple plans — probably four or five is a realistic maximum.

There will be strong links between some of the groups (for example mapping the safest routes to school and creating a walking school bus route would have overlaps), so encourage the groups to communicate their ideas to each other.

2. Explain to students that they will be researching and preparing an action plan that they will present to the class (and later as part of Session 13 to the principal and BoT). Tell them that one plan will be selected for implementation. Provide a clear outline of what is required for presentation.

To present their plans to an audience they will need to show:

- a purpose for their plan
- how their plan makes a difference to reducing the carbon footprint and why we need to (teachers may choose to provide more time for students to research around CO₂ here rather than in Session 4)
- the key features of their plan and how it works.



3. Model how to use the action plan (*Template 11* or *12*) for planning. Go through issues such as:

- 'What are our needs (for example, less congestion, more exercise, environmental protection)?'
- 'What is our overall goal?'
- 'When do we want to achieve this goal?'
- 'Which intervention(s) will work best for our school community?'
- 'What steps do we need to take to achieve this goal?'
- 'What are some problems/issues that might arise (for example storage of selected transportation, getting people on board)?'

Support material for research

- Resources – online and print
- *Template 10: Related School Journal reading activities*

DEVELOP THE ACTION PLANS

Facilitated by teacher

Learning intention

Students will:


- create an action plan for active transport to school and develop skills in:
 - organising tasks and managing their time
 - locating and using relevant information
 - working with others co-operatively through allocation of tasks, listening to and considering others ideas, and sharing their own ideas.

Information for teachers

This will take more than one session.



Learning sequence

1. Revisit the purpose and success criteria for presentation of the groups' action plans from the previous session.
2. Provide each group with some resources on their topic, for example:
 - access to survey data from Sessions 8 and 9, such as where people live who might be encouraged to form a walking school bus or biking group
 -  planning maps in A1 desktop size for each group – the ECan educator can supply these
 - *TravelWise* materials booklet - a copy is included in the *Move It* Resource Box and is available electronically at: www.travelwise.org.nz/media/pdf/Walking_Ideas_Booklet.pdf
 - editions from Environment Canterbury's Ebox <http://ecan.govt.nz/advice/your-school/lesson-resources/pages/e-box.aspx> for example *On the Move* and *A Changing Climate*
 - relevant newspaper articles: some included with the *Move It* Resource Box
 - *Walking School Bus* resource kit www.ltsa.govt.nz/travel/school/walking-school-buses/resource-kits.html.

Provide teacher and educator support throughout the planning process. Organise a series of scheduled meetings with students as they reach key stages in their planning, where they can identify and discuss questions and next steps, and decide on action points.

PRESENT THE PLANS

Facilitated by ECan educator and/or teacher

Learning intention:

Students will:

- use oral and visual language to inform and persuade
- demonstrate their scientific understandings around sustainability
- explain the benefits of active transport on producing a healthy community
- demonstrate their understanding of the action planning process through the presentation of a coherent plan for active transport.

Information for teachers

The purpose of this session is for students to present their plans so that a suitable plan can be implemented within the school.

Prior to the presentation, students must be clear on the criteria for their plan s approval or selection.

Teachers may wish to use the Evaluation of Action Project , available in the *Move It* Resource Box, for students to self assess their competency development on participating and contributing and relating to others

Learning sequence

1. Explain that the students will be presenting their action plans in the style of a dragon s den presentation to a panel including the teacher, ECan educator, principal and BoT representative.

Provide the format of a dragon s den presentation, which could include:

- **The pitch**

Students state their name(s), the outline of their plan, the reasons why their plan is necessary, what benefits their plan will provide, and how their plan will be implemented including overcoming identified difficulties. Put a time limit of 3-5 minutes on the presentations.

- **Questions and answers**

The panel questions the students. Students do not have to answer all the questions asked, but what they do or do not choose to answer may affect the outcome.

- **Feedback**

The panel discusses the plan and gives feedback to the students on the viability of the plan and their presentation technique.

The panel selects a final plan for implementation.


or: Allow students to present their plan(s) to an appropriate audience, such as the class and school principal.



Next steps for putting the plan into action

- Identify stakeholders and get them on board.
- Educate other parts of the school.
- Put the plan into action – this may be in conjunction with teachers and parent groups.
- Look at sustainability of the plan.

ONLINE RESOURCES

- 
ECan resources - Beat the Rush
<http://ecan.govt.nz/advice/your-school/games-movies/Pages/beat-the-rush.aspx>
- Ebox resources** - for example *On the Move* and *A Changing Climate*
<http://ecan.govt.nz/advice/your-school/lesson-resources/pages/e-box.aspx>
- The *TravelWise* booklet (Auckland Regional Transport Authority) will be available as part of the *Move It* Resource Box, and is available on-line at www.travelwise.org.nz/Schools
- The *Walking Map Toolbox for Schools* (Health Sponsorship Council 2006) is available from www.ltsa.govt.nz/travel/school/walk-to-school/walking-map-tool-box/
- Walking School Bus* Resource Kit
www.ltsa.govt.nz/travel/school/walking-school-buses/resource-kits.html
- School Travel plan Coordinators Guide*
www.ltsa.govt.nz/travel/school/walk-to-school/school-travel-plan/index.html

Other School Travel Plan information to assist with developing your students action plans is available from local agencies, such as the New Zealand Transport Agency or your local council.

For Christchurch City email rsc@ccc.govt.nz or phone 941-8299.



- YouTube clips – climate change:
 - www.youtube.com/watch?v=zzjOcOcQ90U
 - www.youtube.com/watch?v=oJAbATJCugs&feature=fvw
- The greenhouse effect:
 - www.coolclimate.org/simplyscience.htm
 - www.bbc.co.uk/climate/evidence/greenhouse_effect_img.shtml
 - www.sciencemuseum.org.uk/exhibitions/energy/site/EIzInfogr9.asp
- Oil is a finite resource:
 - www.energyquest.ca.gov/transportation/index.html
 - www.energyquest.ca.gov/story/chapter08.html
 - www.eia.doe.gov/kids/energyfacts/sources/non-renewable/oil.html



- *A Crude Awakening*: www.youtube.com/watch?v=6HRZPpbpSjg
- Buses in Christchurch:
 - www.nzine.co.nz/features/designline3.html
 - www.designline.co.nz/
- Carbon and fuel calculators:
 - www.carbonzero.co.nz/calculators/school_emissions_calc.asp#
 - <http://fuelsaver.govt.nz/>
- Vocabulary activities:
 - <http://en.wikipedia.org/wiki/Balderdash>
 - www.eclipsecrossword.com
 - <http://createfreecrosswordpuzzle.34815.free-press-release.com>

PRINT RESOURCES

SCHOOL JOURNALS

For related activities see *Template 10*, pages 74-77.

Title	Journal	Type	Guided reading level	Related activity included
<i>The vege car</i>	3:1:2007	Article	10-12	✓
<i>Don't miss the bus</i>	1:1:2006	Article	7-8	✓
<i>Boring Street</i>	2:2:2005	Story	8-9	✓
<i>Getting the green light</i>	Connected 2:2001	Article		✓
<i>Biogas station</i>	4:2:1986	Article	9.5-10.5	✓
<i>Endless energy</i>	4:2:1986	Article	10-12	
<i>Bicycle courier wanted</i>	4:3:95	Article	9.5-10.5	
<i>Jumping for joules</i>	Connected 3:2008	Article		
<i>Bike day</i>	3:3:2005	Story	9.5-10.5	✓
<i>If cars were banned</i>	YP 1:2006	Article		
<i>The school bus robot</i>	2:1:2007	Play	9-10	
<i>Bus driver</i>	1:3:2001	Article	8.5-9.5	
<i>The boat race</i>	Connected 3:1998	Story with motor building instructions		
<i>Dead car clean Up</i>	2:2:2004	Article	9.5-10.5	
<i>The greenhouse effect - just hot air?</i>	3:1:1994	Article	10-12	
<i>The motorway debate</i>	4:1:1992	Article	12-14	

- Some relevant newspaper articles are included in the *Move It* Resource Box

- *Tas and the Solar Bike*. Marathon Books 2009. ISBN 978-0-9582379-9-4
- *The Solar Challenge*. Marathon Books 2009. ISBN 0-9582274-6-2

- Suggested resource books – these are available from the National Library:
 - *Oil* by John Farndon. DK Publishing Inc, Dorling Kindersley Ltd, 2007
ISBN: 9780756629694
 - *On the move: green transportation* by Kathy and Adam Furgang. New York: Rosen Pub Group, 2009
ISBN: 9781404217737
 - *Environment: Saving our planet* by Jessica Perini. Australia, New Holland Publishers 2008
ISBN: 9781921073502
 - *Protecting earth's air quality* by Valerie Rapp. USA, Lerner publications, 2009
ISBN: 9780822575580
 - *Why should I walk more often?* by MJ Knight. London, Franklin Watts, 2008
ISBN: 9780749680497
 - *How big is your travel footprint?* by Paul Mason. South Yarra [Vic.], Macmillan Library, 2008.
ISBN: 9781420261516
 - *Global warming (what's that got to do with me?)* by Anthony Lishak. London, Franklin Watts, 2009
ISBN: 9780749688884

EXTENSION AND ENRICHMENT LESSON PLANS



The items in this section are intended to further students curiosity and understanding.

TRANSPORTATION AND CULTURE ACTIVITY

from http://frederick.thinkport.org/student_transportation.shtml

(Note: *Worksheet B* on the website could be adapted by teachers to fit more with New Zealand modes of transport.)

Learning intentions

Students will:

- identify different types of transport and gain an understanding of how they impact on the environment.



Learning sequence

1. Copy *Worksheet B* for the class. Collect pictures of different forms of transportation (cars, trucks, buses, trains) from magazines. Students use these to construct a class chart of the changes brought about by different forms of transportation.
2. Distribute *Worksheet B*. Discuss the first two options on the chart (riding the bus to school and getting a ride in a private vehicle) as to their effect on children and their families, and introduce the concept that transportation influences the way we live.
3. Brainstorm with the class to find the pluses and minuses of both options. These may include:
 - walking to school:
 - Pluses: getting more exercise, parents don't have to take time from work to pick up students, it is fun walking with friends.
 - Minuses: in rainy or bad weather you need to carry an umbrella or wear extra clothes.
 - riding a bus:
 - Pluses: it is more economical than private transportation and better for the environment.
 - Minuses: buses go on their own schedule, not yours.
4. Divide class into small groups. Ask students to assign different roles to members: leader, recorder(s), cheerleader and members. Ask them to brainstorm about the life changes that resulted or may result from the forms of transportation included on the chart. Ask them to concentrate on what a culture would be like that had only this form of transportation to depend upon.
5. Build a large class chart with the pictures you gathered earlier, summarising what the groups discovered about each form of transportation.
6. As a concluding activity, ask groups to construct an oral presentation (play, skit or debate) that shows how culture is shaped by the forms of transportation a society uses. They might want to play the part of people for whom each form of transportation was the only option, or explore what might happen to society if only one of these options was open to them.

Reference website: http://frederick.thinkport.org/student_transportation.shtml

RESEARCH – RIDING THE BUSES!



Learning intention

Students will:

- research and collate experiences and ideas about existing buses and bus services by planning and carrying out a bus excursion.

Information for teachers:

This bus trip could be in the form of a treasure hunt (like orienteering) or a sustainable transport triathlon involving walking, bikes, scooters and skateboards, as well as the bus ride.

In Christchurch, the biodiesel-fuelled **Sustainable Transport Bus** is available free of charge to classes running the facilitated BTR programme. The ECan educator can arrange for this bus to visit the school, to use the bus as a discussion starter about sustainable transport and alternative fuels (biodiesel) and to take students for a short ride.



Alternatively, the ECan educator can loan a class set of Metrocards (up to five sets are available, so a whole syndicate could do this), so that the students can use the local scheduled bus service. This could be combined with a class trip into town (for example to look at history of transport at the Museum, or to bus out to Ferrymead). In Christchurch, the ECan educator can also meet groups at the Bus Exchange, and show the students some of the features of this building.

Lesson sequence

1. Individually or in their research groups, students plan a citywide excursion using the Metro system. Focus questions:
 - ‘Which destinations would you like to travel to by bus?’
 - ‘What factors do we have to consider when planning a journey by bus?’
2. Go out on the planned bus trip. Students own perceptions are important here. They will be designing their bus or bus system to meet their needs and those of their peers. Questions for evaluation:
 - ‘What is working well about our current bus system?’
 - ‘What would we like to improve?’

Equipment and resources

- *Planning a Day on the Bus* sheets, Metro maps and timetables. Ask the ECan educator about borrowing a class set of Metrocards for this activity.
- Metroinfo online Journey Planner www.metroinfo.org.nz and follow the *Journey Planner* link.
- *Sample risk management plan for bus trip*
- *Planning a day out on the bus*
- *Invitation for Room ___s bus adventure*

An editable version of these documents is available on the *Move It* CD.





Bus ride survey

(use one sheet for each single bus ride)

Date & start time:

Bus route:

Bus number (inside the bus, up the front):

Destination:

What time was bus due?

What time did it actually arrive?

Total travel time:

Number of stops:

- To pick up or drop off passengers:
- Traffic lights / Stop signs etc:
- Stuck in traffic (Where and for how long):

Condition of bus (comment on seats, any tagging or litter, quiet or noisy?):

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.....
.....

Driver friendliness rating:

Overall, what did you like about the trip?

.....
.....
.....

Overall, what could be improved?

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.....
.....

STRIFE IN BUSSVILLE

Learning intention:

Students will:

- identify key factors in creating safe travel to school.



Lesson sequence:

1. The residents of Bussville are concerned about the health of their school children and the record high transport footprint at local schools. The townspeople are holding a meeting to discuss why the air has become so polluted and why the time to travel from A to B has doubled in the last 12 months.
2. Put students into groups and provide them with a persona. Give them the questions below to discuss and answer.

Questions:

- 'What do you think is the main problem?'
 - 'Is the traffic build up at the school gate a problem? Why/Why not?'
 - 'Who do you think is responsible for the air pollution?'
 - 'Who do you think is responsible for the traffic congestion?'
 - 'What do you think the residents of Bussville should do to reduce air and noise pollution and traffic congestion?'
3. Groups share their answers with the class and explain their reasoning.

Police

Someone is going to get seriously hurt outside a school gate sometime soon. Students are not using the correct pedestrian crossings because their parents are signaling to them to cross the road directly across from where they are parked. This is simply not safe! The traffic congestion at the school gate is a problem at all schools in Bussville and there are not enough police to monitor this.

School student

I love walking to school, but my parents think it is unsafe. A walking school bus is great when you're younger, but now I'm in the senior school I'd like to be a bit more independent. It's embarrassing when Mum pulls up at the school gate in her beat up, noisy old car (I'm sure she stalls it once a week just to embarrass me). Sometimes I scoot, but I worry about my scooter getting damaged in the bike stands.

Clean Cities campaigner

I'd like to see more of those really cool electric cars and buses or battery driven buses around our town AND to see them full. Imagine the reduction in traffic congestion, particularly in busy areas like the main street and around the school gates.

Community and public health nurse

I am concerned about the amount of pollution in the air and the effect it is having. Air polluted by exhaust contributes to illness from asthma and other respiratory problems in children. Asthma incidence in children under the age of fifteen is increasing. Children breathe more rapidly and inhale more air per breath than adults. Because children spend more time outdoors being physically active, they are more exposed to outdoor air pollution than adults. Doctors see children with respiratory problems more often than any other chronic health problem, and children are more likely to be hospitalised due to respiratory problems.

I want students to be able to travel to school by bus to lower the number of cars on the road and help reduce the toxic emissions in the air.

Wheelchair bound commuter

I would like to use the bus but need to know whether all the buses are able to take a wheelchair? If only certain buses do, how will this be shown on the bus timetable? How will I recognise which buses can take a wheelchair? Is the driver able to assist me with getting on and off the bus? I can only use the bus if it stops quite near to where I want to be.

Cyclist

I bike almost everywhere I have to go in Bussville. It's the most fun way to get around it's also cheap, keeps me fit and doesn't create any pollution. Plus I always get a parking space right outside my destination – if I have to drive my car somewhere, that's the thing I miss most.

I love cycling, but in this last year it has become harder to ride around safely. There are more cars on the road, and many drivers don't seem to be able to see you when you're on a bike! When I'm driving, I especially watch out for cyclists, because I know what it's like to be out there pedalling.

During term time the roads seem especially bad – there must be a lot more kids being driven to school these days. When I was at school, everyone either biked or walked. I can understand parents today being concerned about traffic safety, but if they keep driving their children to school, then they're part of the problem, not part of the solution!

Bus driver

I'm starting to get bored with my job. Not many people are using the buses anymore, which means I'm not meeting and greeting as many as I'd like to. Some of those that do use my bus don't treat it with respect. I consider my bus as my home away from home and I get pretty annoyed when people graffiti all over it, park their chewing gum under my seats or leave their rubbish lying around.

'I have to say, I'm a bit worried about students around school gates also. I find it very difficult trying to manoeuvre around all the vehicles near schools – why can't the parents put their kids on the bus? It would be cheaper in the long run and kinder to the environment – not to mention safer!

TEMPLATES



OUR CARBON FOOTPRINT



What are some of the effects of climate change?

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How does CO₂ gas get into the atmosphere?

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What solutions are there?



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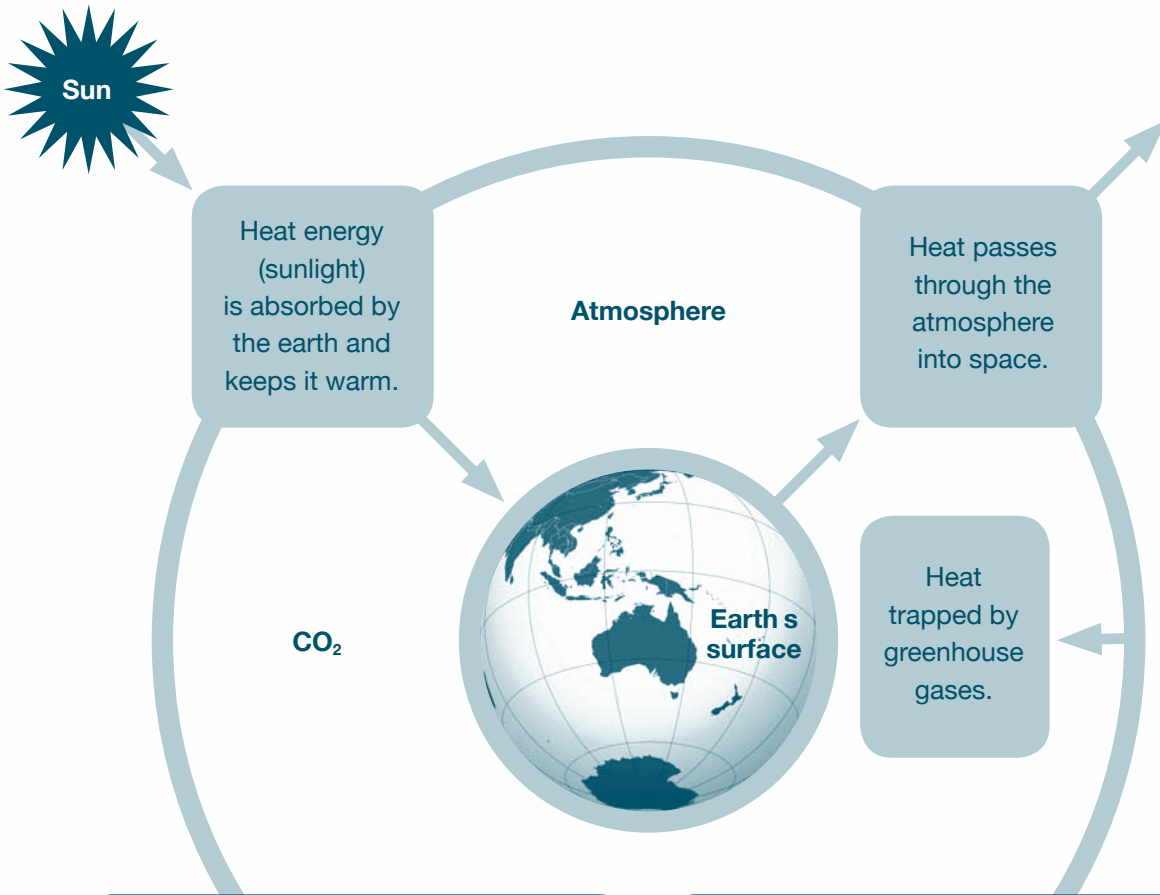
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GREENHOUSE EFFECT



List the causes of global warming

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What are the long term effects of global warming?

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GLOSSARY

Getting from A to B by walking, scooting, skateboarding, roller-blading, biking etc.

Fuels made from natural non-fossil sources such as plants and animal fats.

Or 'omnibus', which means 'for everyone'. An energy efficient means of land transport, which reduces traffic congestion.

The measure of the amount of carbon dioxide emissions that can be attributed to an organisation, product or individual.

Sharing a ride with others to reduce fuel use and traffic congestion.

A gas present in the atmosphere that is formed when any fuel containing carbon is burned.

Greenhouse gases and pollutant gases that are released into the air, including carbon monoxide (CO), carbon dioxide (CO₂) and methane.

The capacity to perform work.

Any change to the environment resulting from an individual's or organisation's activities, products or services.

An organisation concerned with the sustainable management of Canterbury's natural and physical resources such as land, air, water.

Fuels formed from the remains of plants and animals a long time ago.

A substance that when burnt, releases energy e.g. wood, oil, petrol or gas.

A vehicle with correctly inflated tyres and appropriately sized and tuned engine to maximise fuel efficiency.

An increase in the overall temperature worldwide with growing scientific evidence to show it is caused by the enhanced greenhouse effect.

The process in which the emission of infrared radiation by the atmosphere warms the planet's surface. A vehicle powered by an electric motor as well as a normal petrol motor to achieve much greater fuel efficiency.

The passenger transport system in Christchurch and Timaru.

Naturally occurring useful materials or organisms such as ores and fossil energy sources, and also air, water and biomass.

Source of energy that cannot be replenished (made again) in a short period of time, such as fossil fuels.

The point or timeframe at which the worldwide production of conventional crude oil peaks in volume.

Vehicles carrying many passengers which run according to a set timetable, such as buses, trams, trains and ferries.

Energy derived from natural processes that are replenished constantly, for example electricity generated from solar, wind, ocean, hydropower etc.

A plan that sets out to reduce vehicle congestion at the school gate, improve road safety for students and increase their physical activity.

All forms of transport which minimise emissions of carbon dioxide and pollutants, and reduce traffic congestion.

Too many vehicles on roads and intersections at one time, which then causes traffic delays and extra pollution.

The original form of transport, and the most healthy, safe, cheap, sustainable and enjoyable means we have of getting about!

Map designed for pedestrians which may include walkable short cuts to schools, shops, public transport timetables etc.

A group of children travelling to and from school with an adult driver supervising. Commonly used with children who are too young to walk by themselves, but may include older children as buddies for the younger ones.

GLOSSARY LOOPY



Who has fossil fuel?

I have fuels formed from the remains of plants and animals a long time ago.

Who has traffic congestion?

I have the situation when there are too many vehicles on roads and intersections at one time, which then causes traffic delays.

Who has sustainable transport?

I have all forms of transport which minimise emissions of carbon dioxide and pollutants, and reduce traffic congestion

Who has emissions?

I have greenhouse gases and pollutant gases that are released into the air, including carbon monoxide, carbon dioxide (CO₂) and methane.

Who has active transport?

I have getting from A to B by walking, scooting, skateboarding, rollerblading, biking and so on.

Who has walking school bus?

I have a fun, safe and active way for children to travel to and from school with adult supervision.

Who has public transport?

I have vehicles carrying many passengers to a set timetable.

Who has bio-fuel?

I have fuels made from natural non-fossil sources, for example plants and animal fats.

Who has carbon footprint?

I have a source of energy that cannot be replenished or made again in a short period of time, for example fossil fuels.

Who has global warming?

I have an increase in the overall temperature worldwide with growing scientific evidence to show it is caused by the enhanced greenhouse effect.

Who has renewable energy?

I have energy obtained from natural processes that are replenished constantly, for example electricity generated from solar, wind, ocean, and hydropower.

Who has bus?



I have a vehicle designed to carry many passengers to a similar destination on land. It also reduces traffic congestion.

Who has natural resources?

I have naturally occurring useful materials or organisms such as ores and fossil energy sources, and also air, water and biomass.

Who has Environment Canterbury?

I have an organisation concerned with the sustainable management of Canterbury's natural and physical resources.

Who has peak oil?

I have the point or timeframe at which the worldwide production of conventional crude oil peaks in volume.

Who has Metro?

I have the passenger transport system in Christchurch and Timaru.

Who has car pooling?

I have sharing a ride in a private car with others to reduce fuel use and traffic congestion.

Who has school travel plan?

I have a vehicle with correctly inflated tyres and appropriately sized and tuned engine to maximize efficiency.



Who has what bio-diesel can be made from?

I have vegetable oil, animal fats and virgin oil.

Who has CO₂?

I have a gas present in the atmosphere that is formed when any fuel containing carbon is burned.

Who has 'smiley face'?

I have a plan that sets out to reduce vehicle congestion at the school gate, improve road safety for students and increase their physical activity levels.

Who has walking?

I have the healthiest, environmentally sound, cheap, sustainable and enjoyable means we have of getting about.

Who has walking map?

I have a map designed for pedestrians that may include walkable short cuts to schools, shops, public transport timetables and so on.

Who has a fuel efficient vehicle?

I have the measure of the amount of carbon dioxide emissions that can be attributed to an organisation, product or individual.

Who has environmental impact?

I have any change to the environment, resulting from an individual s or organisation s activities, products or services.

Who has hybrid car?

I have a vehicle powered by an electric motor as well as a normal petrol motor to achieve much greater fuel efficiency.

Who has non-renewable energy?

TRANSPORT FACTS

Canterbury public's means of transport to work

Type of transport	Percentage of people
Drive	80%
Walk/jog	6.2%
Bike	5.4%
Public transport	3.7%

NZ Census 2006

Transport infrastructure (roads and parking areas) cover 25-30% of land in most modern cities.

Cited in Ministry for Environment 27/01/09

Vehicles powered by fossil fuels (petrol and diesel) release greenhouse gases like CO₂ and nitrous oxide into the air. In New Zealand transport contributes to 18% of CO₂ emissions.

Data courtesy Ministry for the Environment

96% of cars travelling to work in the greater Christchurch area have one driver and no passengers.

Greater Christchurch Travel Demand Management Strategy

A road lane 3-4 metres wide can accommodate 2,300 people passing per hour in cars. The same road space can accommodate 7,000 in buses and 13,000 on bicycles.

New Zealand has the third highest car ownership level in the world*. In Canterbury there are about 312,000 cars, trucks and vans on our roads**.

* cited in www.economist.com, 26 Jan 2009

** Statistics NZ

Oil supplies about 85% of New Zealand's transport energy needs.

Christchurch has over 131 kilometres of on-road or off-road cycle lanes.

The car is used for 85% of all daily trips in greater Christchurch.

Draft Greater Christchurch Travel Demand Strategy

Most Canterbury families have two or more cars.

NZ Census 2006

The average bus has 45 seats. The average car has 5 seats.

The average New Zealander is responsible for about 8 tonnes of CO₂ emissions from day to day activities like commuting to work and school by car and heating the home.

www.carbonzero.co.nz/action/index.asp

Fewer primary-school age children are walking or cycling to school and 34% of morning peak traffic is education related.

Greater Christchurch Travel Demand Management Strategy

Information from *On the Move*, April 2009

<http://ecan.govt.nz/publications/General/eBoxTransportOnTheMoveApril09.pdf>

CHANGING METHODS OF TRANSPORTATION

How can we get people to change the way they travel to school?

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green hat

What are the barriers to getting people to change from travelling by car to school?

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black hat

The Negatives
What problems could arise? What are the disadvantages?


What are the advantages
of active transport?


yellow
hat

The Positives - Why is this a good idea?
What are the advantages and benefits?


DISCUSSION CARDS

<p>Walk</p> 	<p>What are the benefits of walking to school?</p>
	<p>How can we get people to walk to school?</p>
	<p>Why don't people walk to school?</p>


<p>Car</p> 	<p>What problems are associated with travelling to school by car?</p>
	<p>Why do people travel by car?</p>
	<p>How can we encourage people to use a form of active transport?</p>

<p>Bus</p> 	<p>What are the advantages of travelling to school by bus?</p>
	<p>Could you bus to school? Explain why/why not.</p>


Bike	What are the advantages of travelling to school by bike?
	What are the problems associated with biking to school?




Scooter	What are the advantages of travelling to school by scooter?
	What are the problems associated with having scooters at school?
	Would you travel to school by scooter? Explain why/why not?




Roller blades	What are the advantages of travelling to school by rollerblade?
	What are the problems associated with rollerblading to school?
	Would you travel by rollerblade? Explain why/why not.




<p>Taxi</p>	<p>Why do some people come by taxi to school?</p>
	<p>What active methods of transport could these people use? How would you persuade them?</p>



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IMPORTANT FACTORS WHEN TRAVELLING TO SCHOOL

Pollution	Cost
Using petrol	Climate change
Time	Exploring your neighbourhood
Safety — traffic on roads	Travelling with friends
Safety — at the school gate	Feeling 'awake' - fresh air - clear head - ready to learn
Fitness and health	Having fun

HOW STUDENTS TRAVEL TO SCHOOL

Thinking about how students travel to and from _____ School,
what are the most important things for the students (us)?

HOW STUDENTS TRAVEL TO SCHOOL - IMPORTANT THINGS FOR PARENTS/FAMILY

Thinking about how students travel to and from _____ School,
what are the most important things for parents/family?

HOW STUDENTS TRAVEL TO SCHOOL - IMPORTANT THINGS FOR TEACHERS/THE SCHOOL

Thinking about how students travel to and from _____ School,
what are the most important things for teachers/the school?

HOW STUDENTS TRAVEL TO SCHOOL - IMPORTANT THINGS FOR THE COMMUNITY

Thinking about how students travel to and from _____ School,
what are the most important things for the community?

HOW STUDENTS TRAVEL TO SCHOOL - IMPORTANT THINGS FOR THE ENVIRONMENT

Thinking about how students travel to and from _____ School,
what are the most important things for the environment?

HOW STUDENTS TRAVEL TO SCHOOL - IMPORTANT THINGS FOR _____

Thinking about how students travel to and from _____ School,
what are the most important things for _____?

RELATED SCHOOL JOURNAL READING ACTIVITIES

Biogas Station and Endless Energy — Part 4 Number 2 1986

1. How is biogas formed?
2. What caused people in China to experiment with biogas and what did they use to make it?
3. Why didn't we produce biogas on a larger scale in New Zealand?
4. There are a few enterprising people making biogas in New Zealand. What are they using to make it?
5. Is biogas used in New Zealand?
6. Read the last sentence of this article. Have we passed the time suggested? (You will need to calculate this using the date on the cover of the Journal.) Do you think he was correct in his predictions? Why/why not?

Getting the Green Light — Connected 2 2001

1. Why is it so dangerous for George Street Normal students to get to school?
2. What data did the students collect in their survey about the intersection?
3. What were the busiest times of the day at the intersection and at what time was the intersection considered dangerously busy?
4. What dangerous things were pedestrians doing when crossing George and Duke Streets?
5. How did the results of the student survey help the Dunedin City Council?
6. Who else benefited from the lights being installed at the intersection?

Bike Day — Part 3 Number 3 2005

1. What is the full name of the national day where biking is encouraged and promoted throughout New Zealand? It is in February.
2. Why do you think Nathan didn't want to catch up with Mr Griffiths?
3. What words and phrases from the text make us think Mr Griffiths found biking hard work?
4. Why do you think Mr Griffiths tried to avoid the bike safety inspection? Was this a safe thing to do?
5. Who else did Mr Griffiths get into trouble with over the use of the old bike? And what was her connection with the school?

The Vege Car — Part 3 Number 1 2007

1. What were James Nui Macdonald's main reasons for wanting to make a car that didn't need petrol?
2. Think of two problems with normal (petrol) cars which by the Macdonalds' 'Vege Car'.
3. Think of two problems with normal (petrol) cars which by the Macdonalds' 'Vege Car'.
4. What might happen if every car in New Zealand was converted to run on vegetable oil?
5. What is the difference between a vege oil-powered car and a (see, for example: http://en.wikipedia.org/wiki/Toyota_Prius)? Do a PMI (Plus, Minus, Interesting) on both types of car.

Boring Street — Part 2 Number 2 2005

1. How does Ryan build up his map of his new neighbourhood?
2. What features would you include in a map of your home and school community?

Don't Miss the Bus — Part 1 Number 1 2006

Students read the story, then are encouraged to backcast, i.e. think about what happened before the day when the story is set to create St Anne's School's Walking School Bus.

1. Who would have been involved in creating the Walking School Bus?
2. What resources did they need (think objects, props, people's time, money)?
3. How might they have publicised and promoted the Walking School Bus?
4. What things might cause a Walking School Bus to stop running, and how might they keep their one going?

This story and questions may be a useful way of helping the students to sequence the development of their plans (Sessions 11-12).

Some more questions about Walking School Buses:

1. What are the pluses and minuses of a Walking School Bus?
2. What age children is a Walking School Bus best suited for?
3. What age is suitable for children to walk to school on their own? Why?

JOURNAL ACTIVITIES - ANSWERS

Biogas Station and Endless Energy — Part 4 Number 2 1986

1. When dead plants and animals are kept in a damp airless place, bacteria feed on them and produce a gas we call biogas or methane .
2. The rise in fuel costs in the 1970s in China. Toilet waste, weeds and manure from the animals.
3. New Zealand didn't produce enough waste. Kale, grass, oats and lucerne.
4. Waste from a piggery, thistles, seed husks, chicken manure, waste from freezing works and dairy factories and some sewage works.
5. No, not really. Biogas is being used, but not widely in New Zealand.
6. Answers will vary. Students could research this on the internet. The use of food cropping land to produce biofuel could lead to a world food shortage.

Getting the Green Light — Connected 2 2001

1. Because George Street Normal school is on a busy main street of Dunedin. Students have to cross a very dangerous intersection.
2. The number of cars and the direction they were traveling in. They also counted all the pedestrians who crossed the road.
3. From 8:30 9:00am and from 2:45 3:15pm. The morning was dangerously busy.
4. Waiting in the middle of George Street and walking between cars on Duke Street.
5. It helped them decide to put traffic lights on this intersection. They had only been thinking about it up until this time.
6. The elderly residents of the Leith House rest home. They can now go to the dairy safely.

Bike Day - Part 3 Number 3 2005. **Go by bike day.**

2. A variety of students own answers.
3. Tough going, puffing really loudly, effort of pushing pedals round, he looked pale and sweaty, phew, Bike Day will be the death of me etc.
4. Answers will vary. He didn't want to be told off by the police, he knew his bike would fail the inspection and he didn't want to look stupid in front of his students. No, it wasn't a safe thing to do – he should have had the bike inspected so as he knew what to do to fix it. He would have been a better role model for his students also.
5. His mother. She ran the school canteen.

Boring Street — Part 2 Number 2 2005

1. Bit-by-bit he adds in the features that he becomes familiar with as he gets to know his new place.
2. Each student will have their own favourite haunts around the neighbourhood, and some of these will be useful in creating school transport maps: short-cuts, safe crossing places etc. Encourage the students to think about putting their own features onto the maps used in Session 10-12.

The Vege Car — Part 3 Number 1 2007

1. Protesting against the war in Iraq, upholding traditional Maori values, not putting nasty gases into the air, and saving money.
2. Students answers will vary, but may include: vege oil is renewable, emissions are less harmful, carbon-neutral, fuel is local, not imported.
3. Students' answers will vary, but may include: car crashes / safety, traffic congestion, lack of exercise / health issues, still costs money to buy fuel.
4. Students answers will vary, but may include: shortages of vege oil, shortage of land to grow fuel crops and food crops, cleaner air.
5. Hybrid car runs on regular petrol, with a second electric motor as additional power. Saves fuel and emissions, but still relies on fossil fuels.

ACTION PLANNER (YEAR 7/8)

The diagram is a flowchart with interconnected boxes. At the top left is a box titled "What is the issue?" with two bullet points. At the top right is a box titled "What is our vision?" with two bullet points. A double-headed horizontal arrow connects these two boxes. Below each of these is a larger box with a dark header and a list of six bullet points. A vertical double-headed arrow connects the top two boxes to the middle two boxes. In the center is a large box with a dark header, a list of three bullet points, a dark horizontal bar, and another list of three bullet points. To the left of this central box is a box titled "REALITY CHECK" with two bullet points: "Is our vision the right one?" and "Will these actions lead to our visions?". To the right is a box titled "EVALUATION" with one bullet point: "Did our actions lead to movement towards our vision?". Arrows point from the central box to both the Reality Check and Evaluation boxes. Below the central box is another box with a dark header and one bullet point. To the right of this is a box titled "How will we find out what people think and feel?" with five bullet points. A vertical double-headed arrow connects the bottom two boxes. At the very bottom is a box with a dark header and one bullet point.

What is the issue?

-
-

What is our vision?

-
-

What will we need to know?

-
-
-
-
-
-

REALITY CHECK

- Is our vision the right one?
- Will these actions lead to our visions?

EVALUATION

- Did our actions lead to movement towards our vision?

How will we find out what people think and feel?

-
-
-
-
-

Who could influence decisions?

-

How will we find out what people think and feel?

-

TRAVEL ACTION PLAN (YEAR 5/6)

Name of plan:

.....

Names of group members:

.....

.....

.....

What is the issue/problem?

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What is our vision?

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Main points of the plan (**what** is going to happen?)

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Who needs to be involved?

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.....

What information do we need? How are we going to get it?

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TRANSPORT SURVEY - EXAMPLE 1

Calculate your contribution/travel footprint — possible survey template

1. How many vehicles does your family have?

None One Two Three or more

.....

2. How far do you live from school? _____ km

Nearest major intersection name both streets:

.....

.....

3. Generally speaking, how would you classify the area in which you live?

Urban Suburban Rural Other (please specify) _____

.....

3. How do you get to school most days? Bus Walk Ride bike

Driven by parent or other Other (please specify) _____

(Number of people usually in car) _____

.....

4. Are there footpaths that you can use in your area? Yes No

If No, please specify _____

If not, is there so much traffic (or traffic that speeds) that inhibits your use of the road for walking or biking? Yes No

.....

5. Does a bus service exist in your area? Yes No

.....

6. Have you used the bus? Yes No

.....

7. If Yes, how often? Once in a while Once a month Once a week Every day

Other (please specify)

.....

8. If No, why not?

.....

Additional comments

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(Adapted from the Maryland Department of Transportation): www.dnr.state.md.us/education/growfromhere/Lesson7/lesson7_3.htm

TRANSPORT SURVEY - EXAMPLE 2

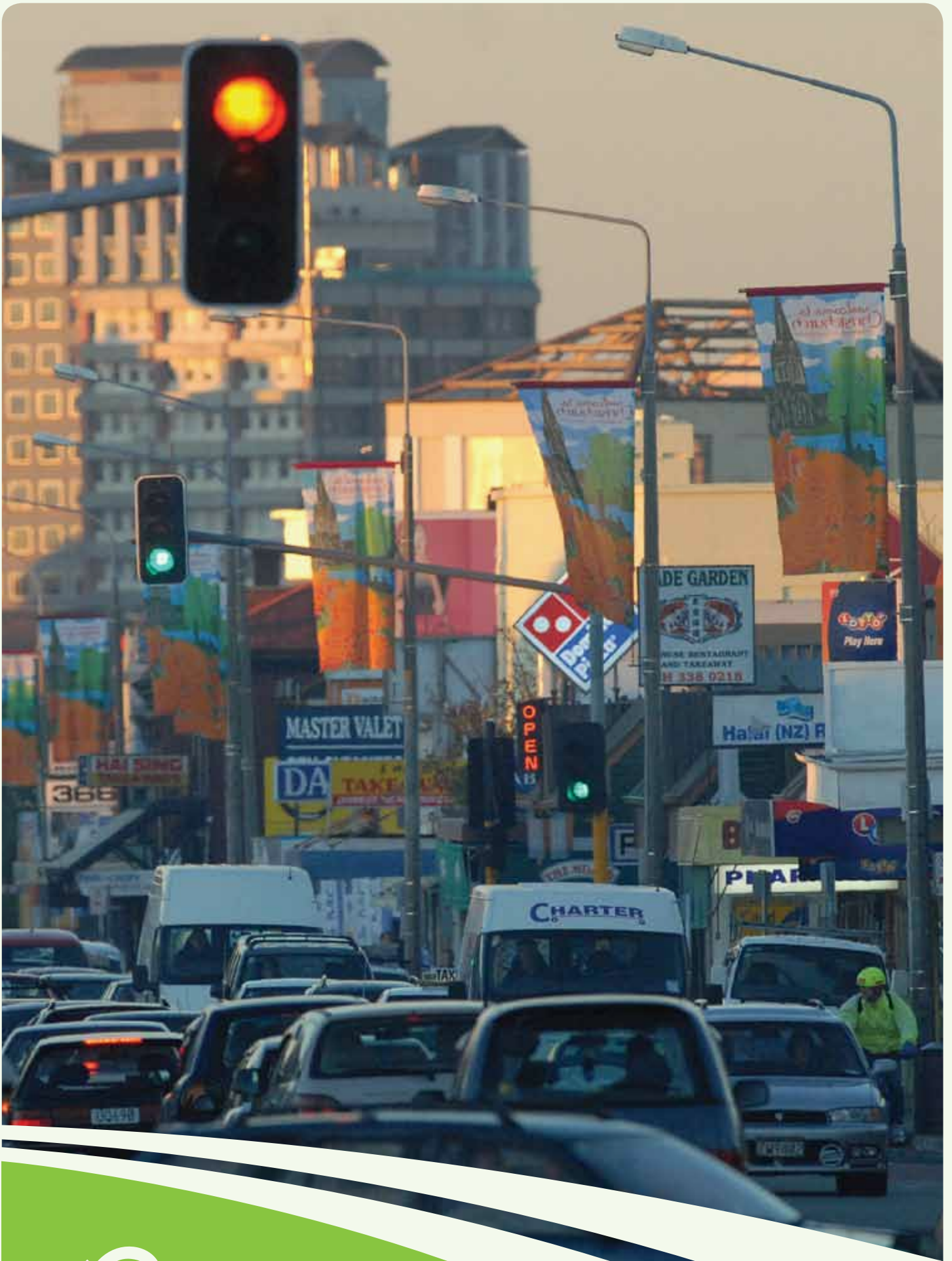
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1. Please fill in your home address in the boxes below.

2. Please tell us how you USUALLY go to and from school each day by ticking the right boxes below. (REMEMBER before or after school activities, or things like Mum or Dad going to work, can affect how you travel each day)

Monday morning							
Monday afternoon							
Tuesday morning							
Tuesday afternoon							
Wednesday morning							
Wednesday afternoon							
Thursday morning							
Thursday afternoon							
Friday morning							
Friday afternoon							

3. How would you like to go to/from school each day? (Tick one of the boxes.)



**Environment
Canterbury**
Your regional council