LET'S CYCLE TO SCHOOL AND CLEAR MAITLAND'S AIR

A School Educational Workbook on Cycling and Active Sustainable Transport Years 5 & 6 students

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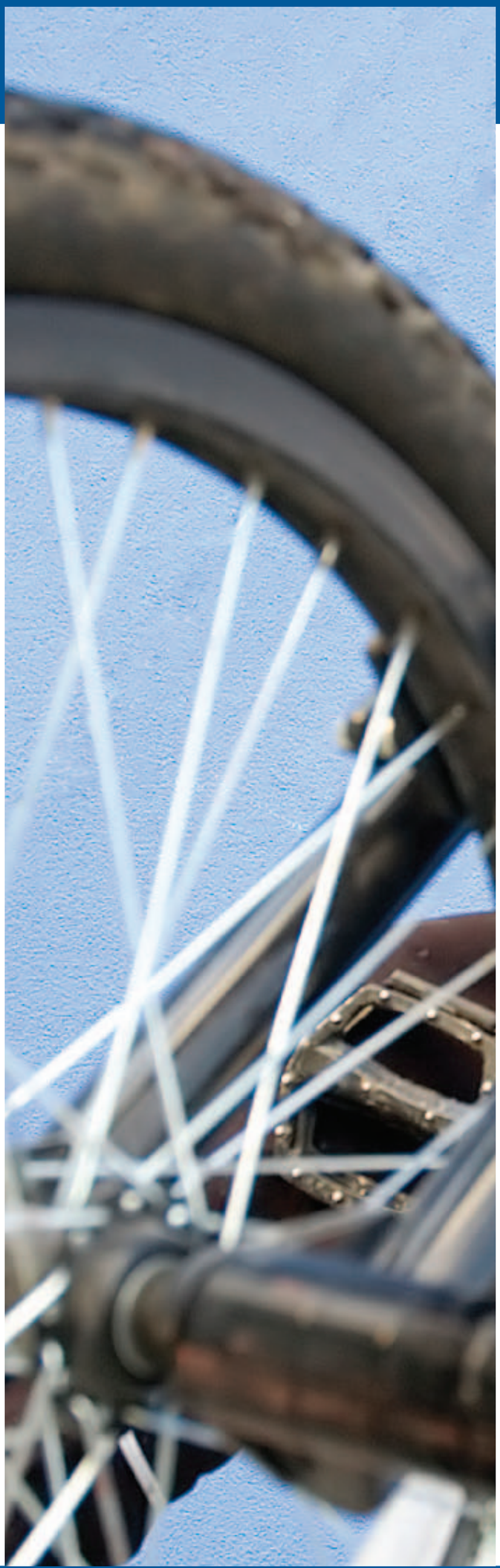

LET'S RIDE TO SCHOOL AND CLEAR MAITLAND'S AIR!

Educational Workbook on Cycling & Sustainable Transport

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Activities and information used in this workbook have been sourced from the following websites:

- www.rta.nsw.gov.au
- www.ride2school.com.au
- www.enchantedlearning.com
- www.cleartheair.nsw.gov.au
- www.grouptrails.com/stretches.htm

DISCLAIMER:

This workbook has been published to increase awareness of the benefits of cycling to schools' and communities' and to promote and encourage the use of cycle pathways around the Maitland area. No warranty or guarantee, whether expressed or implied is made with respect to the data reported or the information provided in the document. All reasonable steps have been taken to ensure that the information is accurate at the time of publication.

LET'S RIDE TO SCHOOL AND CLEAR MAITLAND'S AIR!

Educational Workbook on Cycling & Sustainable Transport

INTRODUCTION

An education kit encouraging Year 5 & 6 (Stage 3) students to cycle

Cycling is an active form of transport for people of all ages – it's healthy, environmentally friendly and enjoyable.

Maitland City Council is committed to promoting cycling as a sustainable transport choice.

At Maitland City Council our aim is to create a network of safe and practical cycleways that encourage the community and its visitors to cycle rather than drive. Through this kit we aim to work with schools and students to increase awareness of Maitland's cycle routes and the health and environmental benefits of cycling safely.

This education resource is broken into five units with valuable information and activities to aid learning and understanding of the following topics:

UNITS

Unit 1: Cycling around Maitland

Part of the Cycle Safely message is knowing where the bicycle routes are in your local area. This unit encourages students to use the Maitland Cycleway Map to plan their cycle trips and to locate cycling routes. It also provides information and activities to teach students how to read common road and cycleway signs.

Unit 2: Environment benefits of cycling

Encouraging cycling and walking can reduce our reliance on cars, which in turn reduces carbon emissions and has a positive impact on the environment. Activities in this unit will help students visualise how much their carbon emissions can be reduced simply by riding a bike or walking to school instead of riding in a car. The second activity will allow students to realise the impact they may be having on the environment each day and they will be encouraged to use their creativity to think of ways to reduce their impact.

Unit 3: Health benefits of cycling

Cycling can have many health benefits. This unit explains these benefits and includes a few activities and exercises that will help students prepare for their next bike riding excursion.

Unit 4: Cycling safety

Maitland City Council recognises that it is not only important to encourage people to ride their bikes, but also to do it safely. This unit will help students think of ways they can prepare for a bike ride and how to stay safe while out riding. The unit includes a series of exercises and quiz questions with answer pages provided.

Unit 5: Travel survey

This activity helps students investigate alternative ways to travel to and from school and looks at how past generations (their parents and grandparents) travelled. Students then use fractions, percentages, tables and graphs to compare these modes of travel amongst their class and over time.

LEARNING OUTCOMES

Students will be able to:

- Describe the health and environmental benefits of cycling
- Name the major parts of a bike and the function of each part
- Explain the need for rules and laws concerning road safety
- List the major safety precautions to be observed while riding a bike
- Explore different ways to travel to school
- Understand how to calculate carbon emissions from cars and how riding a bike can benefit the environment
- Undertake a survey and tabulate the results.

RESOURCES

This kit is designed to complement existing resources available to teachers:

- NSW Office of Environment and Heritage – Active for Air Program: http://www.environment.nsw.gov.au/activeforair/index.htm
- NSW Office of Environment and Heritage – Let's Clear the Air Program: http://www.cleartheair.nsw.gov.au
- RTA Bicycle Riders Handbook: http://www.rta.nsw.gov.au/usingroads/downloads/bicycle_riders_handbook.pdf
- Other RTA bicycle material can be found at http://www.rta.nsw.gov.au/usingroads/bicycle/index.html ; http://www.bicycleinfo.nsw.gov.au
- RTA Move Ahead with Street Sense resource, order using the RTA Primary Catalogue
- TravelSmart Teacher Resource Kit http://www.travelsmart.gov.au/teachers/index.html
- Ride to School website has many curriculum based resources for students and teachers http://www.bv.com.au/general/ride2school

Created by Maitland City Council as part of the Clean Air Healthy Communities – Local Air Education Project Funding Grant a funding initiative of NSW Office of Environment and Heritage.

CYCLING AROUND MAITLAND
Teacher Resource

1

AIM

Part of the Cycle Safely message is knowing where local bicycle routes are located. This unit encourages students to use the Maitland Cycleway Map to plan their cycle trips and to locate cycling routes. It also provides information and activities to teach students how to read common road and cycleway signs.

CURRICULUM OUTCOMES:

Activity 1.1 - Planning a safe bicycle trip in Maitland

Key Learning Area	Syllabus Outcomes Addressed
Human Society and its Environment	ENS3.5,
Personal Development, Health and Physical Education	PSS3.5, DMS3.2, ALS3.6, PHS3.12
Mathematics	MS3.1, SGS3.3

Activity 1.2 - Traffic signs and signaling around Maitland

Key Learning Area	Syllabus Outcomes Addressed
Personal Development, Health and Physical Education	SLS3.13

INSTRUCTIONS

Activity 1.1 - Planning a Safe Bicycle Trip in Maitland

1. Provide students with a copy of the Maitland Cycleway Map and the Cycling Around Maitland Factsheet.
2. Demonstrate to the class how to read the map, including how to use the scale to measure distance. Highlight where the school is on the map, asking students to mark their home. If the school and locality is not in an area that the map covers you may like to undertake this activity using an internet mapping program such as the Whereis website: www.whereis.com
3. Ask students to fill out Activity 1.1 using the Maitland Cycleway Map or an internet mapping tool as a reference.
4. For class discussion topics consider discussing Questions 13 & 14 of Activity 1.1.

Activity 1.2 - Traffic signs and signaling around Maitland

Provide students with a copy of Activity 1.2 and ask them to draw lines to match the traffic signs with their corresponding name and definition. The answers to this activity are provided below.

1. Giveway Sign

2. Stop Sign

3. Roundabout

4. Bicycle Lane

5. Bicycle Path

6. Shared Path

7. Bus Lanes

8. Maitland Cycle Route

CYCLING AROUND MAITLAND

Where to Ride in Maitland

CYCLEWAYS

In the Maitland local government area there are areas set aside both on-road and off-road for cyclists.

Cycleways are clearly marked either;

On the road: 

or Signposted: 

Maitland cycleways are also signposted with white signs that have blue writing and a bicycle symbol identifying destination directions so you can find your way around the Maitland area. For example this picture shows such a sign which is located on Melbourne St, East Maitland showing the direction to Maitland and Singleton. So next time you'rer riding look out for the cycleway signs to identify riding paths.

PLAN YOUR TRIP

Information on cycleway routes in the Maitland area are available in the Rutherford to Greenhills Cycleway Pocket Map, which is included in this workbook. Additional copies of the map are available from Maitland City Council.

Before you leave home, plan your trip using the map to identify a cycling or walking route using the Maitland Cycleway Pocket Map. By completing the activity sheet on the reverse side of this page you can practice finding routes to safely ride or walk to and from school, library, shops or other destinations.

OFF-ROAD CYCLEWAYS

Not all cycleways in Maitland are on the road. Up to 12 years of age you can ride on a footpath unless otherwise signed. Maitland also has some off-road cycleways that anyone of any age can ride on. Do you know where these are? Look on the Maitland Cycle Map to find out.

Why not try a nice ride along the river off-road cycleway?

River Walk - Central Maitland

OFF-ROAD SAFETY

When using a designated off-road cycle way;

- Keep to the left of oncoming bicycle riders
- Use your bell to warn pedestrians and other cyclists that you are behind them and going to over take
- Only overtake pedestrians and other cyclists on the right

ACTIVITY 1.1

Planning a safe bicycle trip around Maitland

This activity sheet encourages students, teachers and caregivers to work together to familiarise themselves with the current network of on-road and off-road cycleways in the Maitland area. To complete this activity you will need a copy of the Maitland Cycleways pocket map. Using the Pocket Map complete the questions below and mark travel routes on the Cycleways Map.

1. What street do you live on? _____

   * Draw a star on the map where your home is located or the closest point on the map.

2. On what street is your school located? _____
   * Draw a star on the map where your school is located.
   --- Draw a line from your home to your school following the roads and paths that you usually travel.

3. How do you usually travel to school?

   _____

   --- Use the map key and a ruler to work out the distance that you travel to get to school.

4. What is the distance from home to school travelling along this route? _____ m/km

5. How long does it usually take you to travel to school? _____ min/hours

6. Find the closest cycleway to your home address or starting point. Draw a line on the map using a different colour that follows the most direct route of on-road and off-road cycleways to school. Remember that you are allowed to travel on the foot paths if you are under 12 yrs old

7. What is the distance along this route? _____ m/km

8. Estimate how long would this route take by bicycle? _____ min/hours

9. Work out which is the most interesting way to WALK to school. Draw the route onto the map using a different colour. What makes this route interesting? _____

   _____

10. What is the distance along this route? _____ m/km

ACTIVITY 1.1

Planning a safe bicycle trip around Maitland

11. Estimate how long would this route take to walk? _____ min/hours

12. What is your preferred way to travel to school? (Circle)

Ride a bike Roller blade Roller skate Scooter Skateboard

Walk Bus Train Car Other: _____

13. What are some benefits of being active on the way to and from school? _____

_____

14. If you are usually driven to school or take the school bus, what would make riding or walking more appealing for you?

(Circle) Bike paths; Parkland paths; Quiet roads; Quiet footpaths;

To own a bike; safe road crossings;

Other comments or ideas: _____

_____

_____

_____

15. Would you like to walk or ride to school with other students from your class who live on or near your walking or cycling route? (Circle)

WALKING: Yes No Maybe Write their name _____

CYCLING: Yes No Maybe Write their name _____

Find out where they live and mark the spot on your map with a circle.

16. Extension activity: On your map identify and draw lines using different colours to mark nice or direct walking or cycling routes from YOUR HOME to one or more of the following locations:

- Your friends home
- Your local pool or sports complex
- Your favourite entertainment venue (for example cinema, bowling lane)
- The local shops
- Your local park

ACTIVITY 1.2
Traffic Signs Around Maitland

These traffic signs are found throughout Maitland. Draw lines to match the signs with their meaning.

1. GIVEWAY SIGN or broken white line means you must slow down, approach with caution and give way to all traffic in the intersection.

2. STOP SIGN: When you come to a STOP sign you must stop completely before reaching the STOP line, and as close as possible to the line.

3. ROUNDABOUTS: Like vehicles cyclists must travel in a clockwise direction when using a roundabout. Bicycle riders are allowed to turn right from the left hand lane but must when passing each exit, give way to any vehicle leaving the roundabout from that exit.

4. BICYCLE LANES: These signs indicate that you can ride in the bicycle lane which is marked with white lines on the shoulder of roads.

5. BICYCLE PATH SIGN: Only bicycles can use paths marked with this sign.

6. SHARED PATH: Both cyclist and pedestrians can use paths with a "shared path" sign.

7. BUS LANES: Bus lanes marked with this sign can only be used by buses. Cyclists may not use "Bus only lanes".

8. MAITLAND CYCLE ROUTE: These are signs found throughout Maitland which indicate the direction of safe cycle routes. For example signs pointing to Maitland or Newcastle.

ACTIVITY 2.1: CALCULATING THE ENVIRONMENTAL BENEFITS OF CYCLING

AIM

Encouraging cycling and walking can reduce our reliance on cars, which in turn reduces carbon emission and has a positive impact on the environment. Activities in this unit will help students visualise how much their carbon emissions can be reduced simply by riding a bike or walking to school instead of riding in a car.

The second activity will allow students to realise the impact they may be having on the environment each day and they will be encouraged to use their creativity to think of ways to reduce their impact.

The activity will help answer commonly asked questions like:

- How much carbon dioxide does my car produce? (Q1)
- How can I visualise how much this is? (Q5)
- How many trees would I need to plant to off-set these carbon emissions? (Q6)
- What other things can I do to reduce my environmental footprint? (Q7)

CURRICULUM OUTCOMES:

Key Learning Area	Syllabus Outcomes Addressed
Human Society and its Environment	ENS3.5, ENS3.6
Personal Development, Health and Physical Education	PSS3.5, DMS3.2, INS3.3, PHS3.12
Science and Technology	INV S3.7, UT S3.9
Mathematics	WMS3.2, WMS3.5, NS3.3, MS3.1, SGS3.3

MATERIALS:

1. Computer – Students can utilise their computer skills by researching answers for Question 2 on the internet. Relevant webpages and instructions are provided below. Students could work individually or share computers.
2. Calculator
3. Activity Sheet 2.1

ENVIRONMENTAL BENEFITS OF CYCLING 2

Teacher Resource

INSTRUCTIONS:

1. Ask students to record on their activity sheet how they travel to and from school (car, bus, bicycle or foot).

2. Show students how to calculate how much greenhouse gas they would save per day if they rode or walked to school. Assist them to fill out the following equation by following the Steps (a-d) below. This exercise can be undertaken using computers to calculate the values (Option 1), or using the standard values provided (Option 2).

Equation 1:

(Step a)_____ km x (Step b)___L/km x (Step c)___ kg/CO_2L = _____kg CO_2.

(a) _____(km) number of km travelled to and from school

x (b)_____(L/Km) amount of fuel per km the car uses

x (c)_____(kgCO_2/L) amount of carbon the fuel type emits

= _____(kg/CO_2) Kilograms of CO_2 per day produced by driving to and from school

Option 1: Computer exercise

To calculate each of the values in Equation 1 involves several steps and access to the internet. Students can work individually or share computers:

Step (a): How far (km) do students travel each day to and from school?

Allow students to access the internet. To calculate how far each student lives from school show students how to use an internet mapping tool such as Where is – www.whereis.com. Students can insert their address and the school's address to calculate the distance they travel to and from school each day. This value can be inserted into the first part of the equation.

Step (b): How much fuel per kilometre does the student's family car use (L/km)?

Using the internet ask students to look up their family car (approximate make and model), on the Australian Governments Green Vehicle Guide website www.greenvehicleguide.gov.au. The website will tell the student how much fuel the car uses in L/km. Students can put this amount in the second part of Equation 1.

Step (c): How much carbon dioxide do certain fuels emit?

Fuels differ in the amount of carbon and energy they contain. To calculate the amount of carbon that certain fuels emit, ask the student to identify the type of fuel their family car uses (if not known assume it is petrol), then record the corresponding amount in the third part of Equation 1.

The table below lists the amount of CO_2 emitted from the exhaust for each litre of a particular fuel:

CO_2 Tailpipe emissions/litre of fuel consumed	
Fuel Type	**CO_2 Emissions**
Petrol	2.3 kg
LPG	1.6 kg
Diesel	2.7 kg

(Sourced from the Department of Climate Change and Energy Efficiency
Website: www.environment.gov.au/settlements/transport/fuelguide/environment.html)

Step (d): Ask the students to put their results from the previous steps into the following equation:

(a) _____(km) number of km travelled to and from school
x (b)_____(L/Km) amount of fuel per km the car uses
x (c)_____($kgCO_2/L$) amount of carbon the fuel type emits
= _____(kg/CO_2) Kilograms of CO_2 per day produced by driving to and from school

_____ km x__L/km x ___ kg/CO_2L = _____kg CO_2.

Option 2: Standard Values

If a computer is not available the following steps could be applied:

Step (a): Estimate student travel distance based on suburb distance from school. For example the surrounding suburb might be 0.5-1km, neighboring suburbs might be 2-5km etc.

Step (b): For the purpose of this exercise assume that a standard car uses 9L of fuel per 100km.

Step (c): Assume every student travels in a petrol car that produces 2.3kg of CO_2 emissions.

Step (d): Ask the students to put their results into the following equation:

(a) _____(km) number of km travelled to and from school
x (b)_____(L/Km) amount of fuel per km the car uses
x (c)_____($kgCO_2/L$) amount of carbon the fuel type emits
= _____(kg/CO_2) Kilograms of CO_2 per day produced by driving to and from school

_____ km x__L/km x ___ kg/CO_2L = _____kg CO_2.

3. Students can calculate how much CO_2 they would save if they didn't ride in a car to school for a whole year (assuming there are approximately 200 school days a year) by multiplying their answer from Question 2 (kg CO_2) by 200 days:

_____ kg CO_2 (answer from Q2) x 200 days = _____kg CO_2 per year

4. To calculate how much CO_2 the whole class would save if they all rode or walked to school for a year, ask everyone to provide their answers to Question 3 (for example students could write answers on the classroom board), and ask students to add up all the amounts.

   You might like to remind students why it's important to reduce carbon dioxide and what the benefits of walking and riding a bike to school are. For example, improve local air quality, help reduce climate change, pollution, traffic congestion and noise, and improve health and fitness. You might also like to help the students visualise this by calculating the number of class rooms the same amount of CO_2 would power.

5. Black Balloons:

   The NSW government uses black balloons in the Save Power Campaign to help us visualise something we can't see - carbon pollution. This is a great way to show students the impact our power use has on the environment.

   Ask students to imagine one black balloon contains 50g of carbon pollution. The average NSW home produces 160,000 black balloons of carbon pollution a year. That should be easier for students to visualise than eight tonnes of carbon pollution! If you multiply that many balloons for each house by 2.7 million homes in our state (NSW) that's an enormous number of black balloons being released into the atmosphere each year. (NSW Government website: http://www.savepower.nsw.gov.au/about/about-save-power/whats-a-black-balloon-.aspx)

   To assist students to calculate the number of black balloons driving in a car to and from school produces, ask them to first convert their answers from Questions 2, 3 and 4 from kilograms (kg) to grams (g) by multiplying their answers by 1000. Then they can divide their answer from Question 2, 3 and 4 by 50g.

   For example if a car produces 2000g of CO_2 each day to get to and from school your car is producing:

   = 2000g of CO_2 / 50g for each black balloon = 40 black balloons

   Q2 Answer: _____ g of CO_2 / 50g for each black balloon = _____black balloons produced daily by driving to and from school

   Q3 Answer: _____ g of CO_2 / 50g for each black balloon = _____ black balloons produced per year by driving to and from school

   Q4 Answer: _____ g of CO_2 / 50g for each black balloon = _____ black balloons produced if the whole class drives to and from school every day for a year

6. Off-setting Carbon Emissions:

   Some companies and governments are starting to think about how they can off-set greenhouse gas emissions produced from activities such as driving, flying, and using electricity. Off-setting means that they put in measures to remove greenhouse gases from the air. Plants are great at this—they breathe in carbon dioxide and breathe out oxygen. So planting more trees can help save our planet! They also provide great homes and food for animals.

Calculating how many trees need to be planted for every kilometre we travel in a car or for every light bulb left on is not a simple exercise. This is because the amount of carbon dioxide that a tree absorbs depends on the tree type. Each tree absorbs carbon dioxide as they grow, but how much they absorb also depends on the time of day and the season. However for the purpose of this exercise we will assume that the planting of one tree will absorb 250 kg CO_2 over the first 30 years of its growth.

For example, if the car you drove to school in every day for a year produced 250kg of carbon, you would need to plant one tree to remove the carbon you produced. Although remember that it would take the tree 30 years to consume that much! And it only took you one year of driving to and from school each day to produce that much greenhouse gas!

To help students calculate the number of trees they would need to plant to off-set their carbon emissions, ask them to divide their answers from Questions 3 and 4 by 250kg:

Number of trees needed to off-set emissions caused by driving in a car to school each day for a year?

= _____answer to Q3 / 250kg = _____trees

Number of trees the whole class would need to plant to off-set all of their emissions produced by driving to school for a year?

= _____ answer to Q4 / 250kg = _____trees

Note: This exercise may be conceptually difficult for some students, however the take home messages are:

- Plants absorb carbon dioxide (greenhouse gas) but at different rates at different times of the day and seasons.
- Plants breath out oxygen which humans and animals need to survive.
- While planting trees may reduce greenhouse gases it is not a simple calculation.
- The best way we can help protect the environment is to: reduce carbon emissions by riding or walking, plant native trees and protect existing native trees and bushland.

7. Ask the class to think of other things they can do to reduce greenhouse gas emissions. The following are some example answers:

- Turn off light switches.
- Don't leave appliances running when not in use (computer, tv) and turn them off at the wall.
- Don't waste water, take shorter showers. Getting water from the dam to your tap uses electricity.
- Wash your clothes with cold water and dry them on a washing line instead of in a dryer
- Don't waste food. The break down of food in landfill produces greenhouse gases.
- Reduce the amount of paper you use, don't waste paper and use recycled paper when possible. The removal of trees for paper means there are less trees to absorb greenhouse gases. The production of paper also produces greenhouse gases.

ACTIVITY 2.2: SUSTAINABLE STEPS - OTHER THINGS WE CAN DO TO BE SUSTAINABLE

AIM

This exercise will help students to think about the things they can do as individuals and as part of a community to reduce their environmental footprint and become more sustainable. In the first exercise students will examine the typical activities they do each day and devise alternative activities to reduce their footprint. In the second exercise they will use their creativity to design a sustainable town.

CURRICULUM OUTCOMES:

Key Learning Area	Syllabus Outcomes Addressed
Human Society and its Environment	ENS3.5, ENS3.6
Personal Development, Health and Physical Education	PSS3.5, DMS3.2, INS3.3, PHS3.12
Science and Technology	BE S3.1, INV S3.7, DM S3.8, UT S3.9

INSTRUCTIONS:

1. A Sustainable Day:

   Ask students to fill out the table provided on their exercise sheets by writing down what the activities they undertake each day. Then ask them to think about how they can reduce their impact on the environment for each activity. An example is provided below. Perhaps the students could share some of their ideas with the class after the exercise.

Time	**Action**	**Behavioural change to reduce your environmental impact**
7.00am	Wake up and turn on bedroom light	Open curtain to let in the sunlight instead of turning a light on.
7.10am	Have a shower (10min)	Reduce shower time to save water (2-5min).
7.30am	Eat breakfast and throw scraps and empty packets in bin	Recycle food scraps in compost bin or worm farm. Put empty breakfast packaging in recycle bin if recyclable.
8am	Travel to school in car	Walk, ride a bike or catch a bus rather than drive in a car.

2. A Sustainable Town:

This exercise will give students the opportunity to design their own sustainable town. Students can use their own knowledge and imagination, or they could also use the internet/library to look up information and generate ideas.

If would be a good idea to give them blank paper or butchers paper to draw their design. This activity can be done individually or in groups or pairs.

Some of the things they might like to think about for a sustainable town design could include:

- How will people get around?
- How will their electricity be produced?
- How will they grow their food?
- Where will people play and recreate? What will these areas look like?
- What would the waterways look like?
- Where will the native plants and animals live?
- How will people dispose of or reduce/re-use their waste?
- How will the people look after the towns environment in what they do each day? Will this help to keep people healthy too?

After the exercise students can present their ideas to the class and generate discussion about sustainable living.

ACTIVITY 2.1

Calculating the Environmental Benefits of Cycling

Riding a bike or walking to school instead of driving in a car can help save the planet by reducing harmful greenhouse gases, such as Carbon Dioxide (CO_2) that may cause air pollution and climate change.

1. How do you usually travel to and from school? By car, bus, bicycle or by foot? _____

   _____

2. How much greenhouse gas (Carbon Dioxide - CO_2) would you save per day if you rode your bike, walked to school or caught a bus instead of driving in a car? To answer this question record an answer for the following questions, then insert those answers into Equation 1. Your teacher will help you find the values for this exercise.

   a. How far (km) do you travel to and from school each day? _____km

   b. How many litres of fuel per kilometre travelled does your family car use? _____L/km

   c. What type of fuel does your family car use? _____ . Using the table below record how much carbon dioxide (CO_2 kg) that fuel produces per litre (L) used? CO_2 (kg/L)_____.

CO_2 Tailpipe Emissions/Litre of Fuel Consumed	
Fuel Type	CO_2 Emissions
Petrol	2.3 kg/L
LPG (gas)	1.6 kg/L
Diesel	2.7 kg/L

(Sourced from the Department of Climate Change and Energy Efficiency Website: http://www.environment.gov.au/settlements/transport/fuelguide/environment.html)

Note: Fuels differ in the amount of carbon and energy they contain. The above table lists the amount of CO_2 emitted from the exhaust for each litre of a particular fuel.

FACT BOX

Reducing Traffic Noise:

Cars and vehicles on the road don't only produce air pollution, they also produce noise pollution. Heavy traffic generates noise that can interfere with peoples home, work and recreational lives. Riding a bike however can reduce the noise in your neighbourhood. You can also appreciate the surrounding environment and ride along in peace and quiet by using Maitland's off-road cycle ways.

ACTIVITY 2.1

Calculating the Environmental Benefits of Cycling

3. How much CO_2 would you save if you didn't ride in a car to school for a

   Equation 1: Amount of greenhouse gas produced by car going to and from school each day

   = _____ L/km x _____ kg/L x _____ km = _____ kg CO_2.

   whole year (approximately 200 school days a year)?

   = _____ kg CO_2 x 200 days = _____ kg CO_2 per year

4. How much CO_2 would the whole class save if everyone rode, walked or caught a bus to school for a year?

   Add up every students answer to the last question (Question 3)

   _____

5. 

   Black Balloons: The NSW government uses black balloons in the Save Power Campaign to help us visualise something we can't see - carbon pollution. This is a great way to show the impact our power use has on the environment. Imagine one black balloon contains 50g of carbon pollution. www.savepower.nsw.gov.au/about/about-save-power/whats-a-black-balloon-.aspx

   How many black balloons does driving in a car to school each day produce?

   To work this out convert your answers for Questions 2, 3 & 4 from CO_2 emissions (kg/CO_2) to black balloons? You will have to first convert your answers from kg to g by multiplying your answer by 1000. Then put your answers into the following equations:

   = _____ g of CO_2 / 50g for each black balloon = _____black balloons daily

   = _____ g of CO_2 / 50g for each black balloon = _____ black balloons per year

   = _____ g of CO_2 / 50g for each black balloon = _____ black balloons for the class

   Does this help you visualise the impact that driving in a car instead of walking or riding a bike can have on the environment?

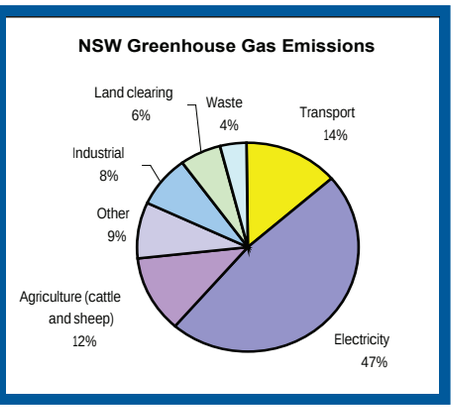
FACT BOX

Transport Emissions:

Did you know that in NSW transport (cars, trucks, buses, trains and planes) contribute 14% of the total of NSW greenhouse emissions!

www.environment.nsw.gov.au/climatechange/emissionsoverview.htm

So short trips on a bike rather than in a car all add up and can reduce greenhouse gases.



ACTIVITY 2.1

Calculating the Environmental Benefits of Cycling

6. Off-setting Carbon Emissions – Some companies and governments are starting to think about how they can off-set greenhouse gas emissions produced from activities such as driving, flying, and using electricity. Off-setting means that they put in measures to remove greenhouse gases from the air. Plants are great at this—they breathe in carbon dioxide and breathe out oxygen. So planting more trees can help save our planet! They also provide great homes and food for animals.

Calculating how many trees you would need to plant for every kilometre you travel in a car or for every light bulb you leave on is not a simple exercise. This is because the amount of carbon dioxide that a tree absorbs depends on the tree type. Each tree absorbs carbon dioxide as they grow, but how much they absorb also depends on the time of day and the season. However for the purpose of this exercise we will assume that the planting of one tree will absorb 250 kg of CO_2 over the first 30 years of its growth.

So how many trees would you need to plant to off-set the emissions caused by driving in a car to school each day for a year (refer to your answer for Question 3)? How many trees would the whole class need to plant to off-set all of their emissions produced by driving to school for a year (refer to your answer to Question 4)?

For example, if the car you drove to school in every day for a year produced 250kg of carbon, you would need to plant one tree to remove the carbon you produced. Although remember that it would take the tree 30 years to consume that much! And it only took you one year of driving to and from school each day to produce that much greenhouse gas!

7. What other things can you do to reduce greenhouse gas emissions?

ACTIVITY 2.1

Calculating the Environmental Benefits of Cycling

8. Useful Websites: Look at the following websites for more information on climate change and for ideas on how to be more energy efficient and sustainable in your daily lives:

- NSW Government Save Power website: www.savepower.nsw.gov.au
- Department of Climate Change and Energy Efficiency Website: www.environment.gov.au/settlements/transport/fuelguide/environment.html
- Australian Governments Green Vehicle Guide website: www.greenvehicleguide.gov.au
- NSW Government – Active for Air Program: www.environment.nsw.gov.au/activeforair/index.htm
- Australian Government Lighting Efficiency: www.climatechange.gov.au/what-you-need-to-know/lighting.aspx
- TravelSmart Teacher Resource Kit: www.travelsmart.gov.au/teachers/index.html
- NSW Government – "Let's Clear The Air" http://www.cleartheair.nsw.gov.au/

ACTIVITY 2.2

Other Things we can do to be Sustainable

Riding a bicycle is just one way to reduce our impact on the environment. There are many other things we could do as individuals and as a community to reduce our environmental footprint and become more sustainable. For this exercise you could choose to do either or both of the activities, the first is thinking about what we can do as individuals and the second is what we could do as a community. Place your answers in the box below, or turn over the page if you need more room. You can be as creative as you like with your answers because creative and innovative ideas will help produce a sustainable future.

1. A Sustainable Day:

   How can you be more sustainable in your daily life? For this exercise list the activities you do each day from morning to night. Then for each activity write how you could change your behaviour to reduce your impact on the environment. For example:

Time	**Activity**	**Behavioural change to reduce your environmental impact**
7.00am	Wake up and turn on bedroom light	Open curtain to let in the sunlight instead of turning a light on.
7.10am	Have a shower (10min)	Reduce shower time to save water (2-5min).
7.30am	Eat breakfast and throw scraps and empty packets in bin	Recycle food scraps in compost bin or worm farm. Put empty breakfast packaging in recycle bin if recyclable
8.00am	Travel to school in car	Walk, ride a bike or catch a bus rather than drive in a car

   Now fill out your Sustainable Day table:

Time	**Activity**	**Behavioural change to reduce your environmental impact**

ACTIVITY 2.2

Other Things we can do to be Sustainable

2. A Sustainable Town:

   This is your opportunity to design a sustainable town. You can be creative and make your town look however you like. Some of the things you might like to think about for your sustainable town design could include:

   - How will people get around?
   - How will their electricity be produced?
   - How will they grow their food?
   - Where will people play and recreate? What will these areas look like?
   - What would the waterways look like?
   - Where will the native plants and animals live?
   - How will people dispose of or reduce or re-use their waste?
   - How will the people look after the towns environment in what they do each day? Will this help to keep people healthy too?

   Use a blank page to draw a map of the town, then present your ideas to the class. You might like to do this activity in pairs or in a group. You could use the internet or library to research sustainable town designs.

HEALTH BENEFITS OF CYCLING 3

Teacher Resource

AIM

Cycling can have many health benefits. This unit explains these benefits and includes a few activities and exercises that will help students prepare for their next bike riding excursion.

CURRICULUM OUTCOMES:

Activity 1.1 - Planning a safe bicycle trip in Maitland

Key Learning Area	Syllabus Outcomes Addressed
Personal Development, Health and Physical Education	DMS3.2, ALS3.6, PHS3.12
Mathematics	WMS3.5, NS3.3

INSTRUCTIONS

Activity 3.1 – Health benefits of cycling

1. What are the health benefits of cycling? Hold a class discussion on the health benefits of cycling. The health benefits of cycling Activity Sheet has information that can assist this discussion.

2. How many calories do you burn while cycling? Ask students to estimate how many minutes it would take them to ride to and from school. Ask them to calculate how many calories they would burn if they rode to and from school each day.

   300 calories per hour/ 60 minutes = 5 calories per minute

   5 calories per minute x ___ minutes to ride to and from school = _____ calories burned riding to and from school

3. What muscles do you use while cycling? This exercise is to get students thinking about the muscles they use while cycling and where these muscles are located on the body. Ask students to look at the list of muscles and organs provided on the activity sheet (numbered 1-6), and to write the corresponding number on the body diagram.

Activity 3.2 - Suggested stretches before and after riding a bike

1. Undertaking a few simple stretches before going for a ride can help reduce the risk of injury. On Activity Sheet 3.4 are some example stretches. You could demonstrate and do these exercise with the class.

ACTIVITY 3.1
Health Benefits of Cycling

1. WHAT ARE THE HEALTH BENEFITS OF CYCLING?

Cycling will:

- Improve your fitness without putting stress on your joints,
- Improve muscle tone and strength,
- Improve joint mobility,
- Strengthen bones,
- Improve posture,
- Lead to better sleep,
- Improve concentration,
- Improve balance and develop coordination skills,
- Help manage weight, and heighten energy levels.
- Prevent health problems such as obesity, heart disease and arthritis later in life.

2. HOW MANY CALORIES DO YOU BURN WHILE CYCLING?

Cycling has been shown to improve your fitness more rapidly than walking as you increase your heart rate to a speed where it improves your health more easily.

Better Health Victoria indicates that steady cycling burns around 300 calories per hour.

Question: How many calories would you burn if you rode to and from school?

_____

_____

3. WHAT MUSCLES DO YOU USE WHILE CYCLING?

Cycling uses all of the major muscle groups as you pedal, giving your body an aerobic workout, working out your heart, blood vessels and lungs thereby improving your overall fitness level.

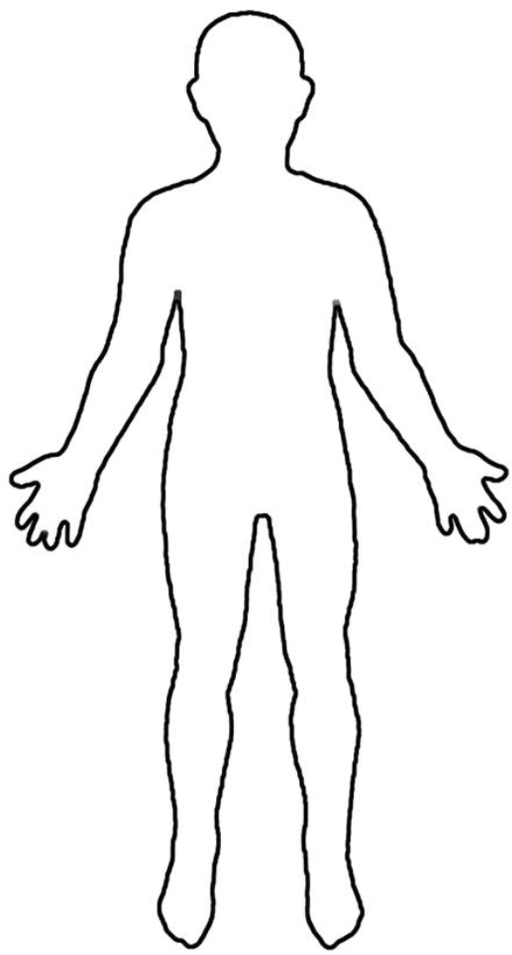
The muscles most used in cycling are those of the buttocks, thighs and calves. Bike riding also keeps the back straight up to maintain balance and strengthens the abdominal muscles.

It is important to remember that when you start cycling that you should start by riding short distances and work up to larger rides as your fitness improves.

It is recommended that you warm up and stretch your muscles before a ride also.See the next page for some example stretches.

Activity: Mark on the diagram below the areas of your body that benefit from cycling:

1. Heart
2. Lungs
3. Buttocks
4. Thighs
5. Calves
6. Abdominal muscles



Source: kidshealth.org/kid/htbw/muscles.html

ACTIVITY 3.2
Stretches Before Cycling

Muscles and tendons are more susceptible to injury when they are cold. By practicing these and other stretches before and after getting on a bike you can avoid muscle soreness and injury.

	**Thigh Stretch** Stand. Pull your ankle towards your buttocks, keeping your knees together. Holding a support if needed. Feel the stretch on your thighs. Hold for 30 seconds.		**Hamstring Stretch** Place leg on a step. Tilt foot up keeping knee straight. With the back straight, bend your chest forward. Feel the pull behind the knee & hamstring. Hold 30 seconds.
	**Hip flex** Stand in walking position. Place hands on waist. Keep the rear-leg almost straight. Push hips forward & down, keeping the back straight. Feel the stretch in your hips.		**Calf Stretch** Stand with feet hip-width apart. Step forward. Keep back foot flat, heel on ground. With back-knee locked slowly push heel down. Feel stretch in your calf muscle.
	**Neck stretch** Pull chin back & up. Hold chin with your hand. Gently push backwards & hold for a minute. Feel the stretch in your neck.		**Achilles Tendon Calf Stretch** Hold a support. Stand on step with your heel over the edge. Slowly hang your weight, dropping the heel towards the ground. Feel the calf stretch.

Source: www.grouptrails.com/Stretches.htm

Other ways you can reduce muscle soreness while riding a bike include:

- Drinking water
- Altering your riding position from time to time to reduce muscle overuse, stiffness and soreness
- Pedalling in lower gear. Using higher gears for long periods of time will stress your knee joints.

CYCLING SAFETY *Teacher Resource* 4

AIM

Maitland City Council recognises that it is not only important to encourage people to ride their bikes, but also to do it safely. This unit will help students think of ways they can prepare for a bike ride and how to stay safe while out riding. The unit includes a series of exercises and quiz questions with answers provided for teachers.

CURRICULUM OUTCOMES:

Activity 1.1 - Planning a Safe Bicycle Trip in Maitland

Key Learning Area	Syllabus Outcomes Addressed
Personal Development, Health and Physical Education	SLS3.13

INTERNET RESOURCES:

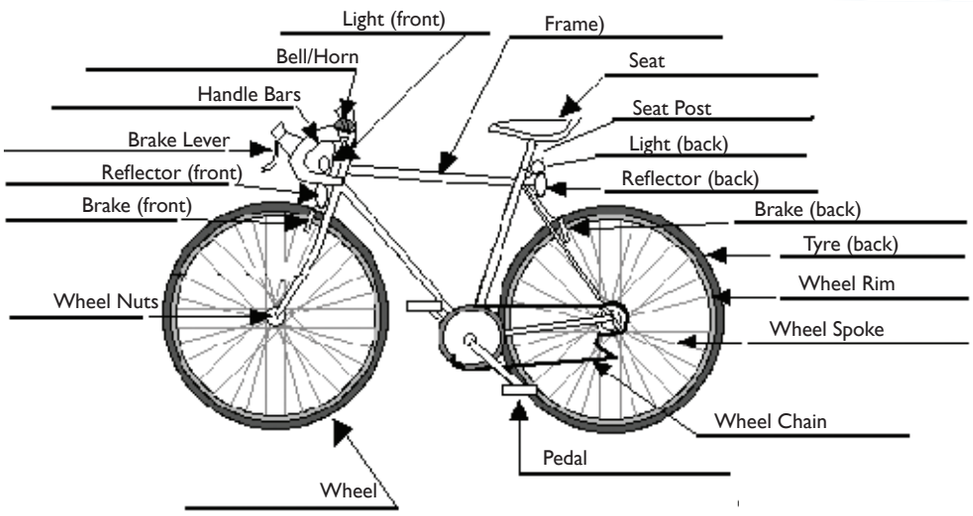
- RTA Bicycle Riders Handbook: www.rta.nsw.gov.au/usingroads/downloads/bicycle_riders_handbook.pdf
- Other RTA bicycle material can be found at: www.rta.nsw.gov.au/usingroads/bicycle/index.html; www.bicycleinfo.nsw.gov.au
- TravelSmart Teacher Resource Kit: www.travelsmart.gov.au/teachers/index.html
- RTA Bicycle Safety Education Kits for primary school students in the Hunter Region are available from Department of Education, Adamstown Phone: (02) 4904 3928.

INSTRUCTIONS

Activity 4.1 – Bike Parts You Should Check Before Going for a Ride

1. It is important to have a well maintained bike to stay safe while riding. Students can check that their bike is in good working order by checking the bicycle parts listed in Activity 4.1 every time they go for a ride. Ask students to identify each part of the bicycle by writing the correct part name in the spaces provided in the bicycle picture. Answers for this activity are provided in the completed diagram below.

2. Hold a class discussion about how to maintain bicycles and the importance of doing so. Information on this can be found in Activity 4.1 sheet and in the Bicycle Maintenance Factsheet.



Activity 4.2 – Cycle Safety Quiz

1. Hold a class discussion about cycle safety. Some cycle safety facts and general road rules are provided in the Cycle Safety Factsheet, Bicycle Safety Equipment Factsheet, Buying the Correct Helmet Factsheet and the answers to the Cycle Safety Quiz Below.
2. Ask the students to fill out Activity 4.2 - Cycling Safety Quiz

CYCLING SAFETY QUIZ ANSWER SHEET

1. Before riding a bike, what safety equipment and items do you need to prepare?

See Bike Safety Equipment Activity Sheet

- Helmet
  - Did you know that wearing an approved helmet could reduce your head injury in the event of a bicycle crash by up to 60 per cent (NSW Roads and Traffic Authority, 2009)
  - Helmet should bear the Standards Association of Australia symbol AS/NZ 2063. Brands bearing this symbol have met strict safety standards.
  - From March 31, 2011 an approved bicycle helmet must also have an identifying mark from a body accredited or approved by the Joint Accreditation System of Australia and New Zealand certifying compliance with the above standard.
- Sunscreen
- Drink Bottle
- Always carry identification, money and/or mobile phone in case of emergency
- Bicycle pump
- First aid kit

2. How would you prepare yourself before going for a ride?

- Stretch,
- Have a drink
- Apply sunscreen
- Let someone know your going for a ride, where your going and when you'll be back

3. Name three items on your bike you should check before going for a ride:

Refer to Bike Parts Activity sheet for examples

In addition, under the NSW Road Rules 2008 a person must not ride a bicycle unless there is at least:

- one effective brake
- A bell, horn, or similar warning device is fitted to the bike and is in working order

4. What should you be wearing when riding a bike:

- Helmet
- Bright clothes and/or reflective vest so you can be easily seen
- Tight fitting clothing – loose cloting could become tangled in the chain or caught in tyres
- Tuck flapping shoe laces into your shoes to prevent them from becoming stuck in the chain, wheels etc

5. How do you know when your helmet is fitted correctly?

Helmets should sit firmly and comfortably on the riders head without moving from side to side, or forward and backwards. To check if a helmet is right for you follow the simple steps below.

- Position the helmet on your head and tilt it forward until the front of the helmet is two fingers above the bridge of your nose.
- Straighten and fasten the helmet straps ensuring a snug fit. A 'V' should be created by the straps just under each ear.
- When done up the helmet should allow the rider to place no more than two fingers between the chin and chin strap.
- Never wear a beanie or hat underneath the helmet as this will affect the correct fitting of the helmet on the riders head.

6. What additional safety equipment should you use when riding at night?

- Front and rear lights:

  The rider of a bicycle must not ride at night, or in hazardous weather conditions unless the bicycle, or the rider, displays:

  a. A flashing or steady white light that is clearly visible for at least 200 metres from the front of the bicycle, and

  b. A flashing or steady red light that is clearly visible for at least 200 metres from the rear of the bicycle, and

  c. A red reflector that is clearly visible for at least 50 metres from the rear of the bicycle when light is projected onto it by a vehicle's headlight on low-beam.
- Wear bright coloured clothing and/or a reflective vest

7. What hand signals should you give when:

Hand signals help to tell other road users what you are doing and where you are going. You are required by law to give a hand signal when turning right or merging to the right lane. When signalling, do so about 30 metres before you turn or change lanes or lane position.

- Stopping, put your hand straight up inline with your head
- Making a turn – put your arm out and point in the direction you want to turn
- Changing lanes - put your arm out and point in the direction or the lane you want to change into.

8. How should you cross pedestrian crossings and signalised intersections?

Dismount your bicycle, wait for cars and traffic lights, when it is safe to cross walk your bike across the crossing.

9. What are the safety risks if you wear ear phones while riding a bike?

You wont be able to hear what is going on around you and you may not hear cars behind you.

10. If you are riding two abreast with someone else on the road what is the safe distance to be apart?

No greater than 1.5m

Remember to ride as far to the left side of the road as is safe

11. What are some of the other things you should do to ensure your riding your bike safely?

Example answers:

- Wear a helmet
- Don't weave over the road or bike path
- Keep at least one hand on handle bar
- Obey road markings, signs and traffic lights
- Don't carry passengers if the bicycle is not equipped to do so
- Never wear ear phones when cycling as you need to be able to hear what is going on around you at all times
- Don't hold on to a moving vehicle when riding a bike
- Ride as far to the left side of the road as is safe
- Let someone know where you intend to ride to and when you will be back
- In case of emergency always ensure you have identification, money and/or a mobile phone with you

Activity 4.3 – Cycling Safety Equipment

1. This activity explains why it is important to wear safety equipment when riding a bike. Ask students to fill out Activity 4.3. The answers to this activity are provided below. For more information see Bicycle Safety Equipment Factsheet.

    - Helmet – Protects my head
    - Reflectors – So people in cars can clearly see me
    - Bike Light – So people in cars can clearly see me at night
    - Sunscreen – Protects me from sunburn
    - Enclosed Footwear – Protects my feet
    - Bell/Horn – Tells people that I'm coming
    - Bright Clothes/Reflective Vest – So people in cars can clearly see me
    - Drink Bottle - So I don't get dehydrated

BICYCLE MAINTENANCE *Fact Sheet* 4

Ensuring your bicycle is well maintained will not only keep your bike in a good looking condition but will also ensure that it is maintained in a good working order.

The NSW Roads and Traffic Authority provides the following information in relation to maintaining your bicycle.

Before riding your bicycle each time you should undertake a quick check of the following:

- Ensure tyres are firm to touch. The correct tyre pressure is written on the wall of tyres.
- Check the seat is at the correct height and that the seat post is tightly inserted at least 5cm into the frame. Riders should be able to straddle the bicycle and place both feet flat on the ground.
- Check brakes are working

    - Handbrakes: squeeze the front brake lever and try to wheel the bicycle forward. The front wheel should not turn and the brakes should contact the rim squarely . Squeeze the back brake lever and try to wheel the bicycle forward. The back wheel should not turn. When brakes are applied there should be no gap between the brake levers and the handlebar.

    - Foot brakes: press down on the pedal with one hand and try to push the bike forward with your other hand. The bike wheel should not turn.

- Ensure pedals are not loose or broken and that they spin freely.
- Ensure handle bars are covered with grips.
- Ensure handle bars are tight and do not wiggle from side to side, forward or backwards .
- Ensure the bell or horn is in good working order.
- If using the bicycle at night ensure the lights are working with a bright white light at the front and a bright red light on the back. A red reflector must also always be visible from the back of the bike.

Each week you should undertake a check of the following:

- Ensure wheel nuts are not loose or broken and that the tyre spins freely without scraping anything.
- Clean and lubricate the chain
- Check wheel spokes and eyelets for rust and damage
- Clear any built up mud and dirt from lights and reflectors

Each month you should undertake a check of the following:

- Check tyres for wear or splits in the rubber
- Check the chain
- Check wheels for rust and buckles, and rims for dents and broken spokes.

Each year you should undertake a check of the following:

- The frame for rust and damage

CYCLE SAFETY *Fact Sheet* 4

The following information is from the NSW Roads and Traffic Authority and should be followed when riding a bicycle:

1. Be predictable– ensure other road users know what you are doing by travelling in a straight line and not weaving all over the road
2. Give clear hand signals when stopping, making turns or changing lanes
3. Obey road markings and signs, and traffic lights
4. Keep at least one hand on your handlebars at all times
5. Do not carry passengers if the bicycle is not equipped with the correct equipment
6. Do not hold on to a moving vehicle when riding your bike
7. On-road ride as far to the left side of the road as is safe. It is legal to ride two abreast as long as you are not more than 1.5 meters apart.
8. Do not ride within 2 meters of the rear of a moving vehicle continuously for more than 200 meters
9. Make clear eye contact with drivers to ensure they have seen you
10. Look ahead constantly to check for hazards and upcoming dangers
11. Use bicycle routes that are on quieter streets and cycleways wherever possible
12. Never wear ear phones when cycling as you need to be able to hear what is going on around you at all times.
13. When riding past a row of parked cars always leave a little room between you and the cars incase somebody opens their car door suddenly. If this does happen be cautious not to swerve straight out onto the road where a car may be passing.
14. Dismount your bicycle to cross pedestrian crossings and signalised intersections
15. When using a designated off-road cycleway keep to the left of oncoming bicycle riders
16. Use your bell to warn pedestrians and other cyclists that you are behind them and going to over take. Only overtake pedestrians and other cyclists on the right.
17. Use front and rear lights when riding at night
18. Ensure your bicycle is the right size for you
19. Ensure both feet can comfortably touch the ground when you are sitting on the seat
20. Ensure your knees do not touch the handlebars of your bike when in motion

For more information see:

- RTA Bicycle Riders Handbook: www.rta.nsw.gov.au/usingroads/downloads/bicycle_riders_handbook.pdf
- Other RTA bicycle material can be found at: www.rta.nsw.gov.au/usingroads/bicycle/index.html; www.bicycleinfo.nsw.gov.au
- TravelSmart Teacher Resource Kit: www.travelsmart.gov.au/teachers/index.html
- RTA Bicycle Safety Education Kits for primary school students in the Hunter Region are available from Department of Education, Adamstown Phone: (02) 4904 3928.

BICYCLE SAFETY EQUIPMENT

Fact Sheet 4

A correctly fitted helmet is the most important piece of safety equipment a child should have when riding a bike. To check if a child's helmet fits properly please see the Fact Sheet "Buying the Correct Helmet".

In addition, under the NSW Road Rules 2008 a person must not ride a bicycle unless there is at least one effective brake, a bell, horn, or similar warning device is fitted to the bike and is in working order

The rider of a bicycle must not ride at night, or in hazardous weather conditions unless the bicycle, or the rider, displays:

a. A flashing or steady white light that is clearly visible for at least 200 metres from the front of the bicycle, and

b. A flashing or steady red light that is clearly visible for at least 200 metres from the rear of the bicycle, and

c. A red reflector that is clearly visible for at least 50 metres from the rear of the bicycle when light is projected onto it by a vehicle's headlight on low-beam.

To ensure you are riding safely you should also:

- Wear bright clothes when cycling in order to be easily seen
- Never wear loose fitting clothing that could become tangled in the chain or caught up in the tyres
- Tuck flapping shoe laces into your shoes to prevent them from becoming stuck in the chain, wheels or any other part of the bike

BUYING THE CORRECT HELMET

Fact Sheet 4

In NSW it is law that any rider of a bicycle on roads and road-related areas must wear an approved bicycle helmet. This also applies to children being carried as a passenger on a bike or in a bike trailer.

Step One: Ensure the helmet complies with Australian Standards

The most important factor when buying a new bicycle helmet is to ensure it bears the Standards Association of Australia symbol AS/NZ 2063. Brands bearing this symbol have met strict safety standards.

From March 31, 2011 an approved bicycle helmet must also have an identifying mark from a body accredited or approved by the Joint Accreditation System of Australia and New Zealand certifying compliance with the above standard.

Step Two: Choose a helmet that fits correctly

Helmets should sit firmly and comfortably on the riders head without moving from side to side, or forward and backwards. To check if a helmet is right for you follow the simple steps below.

1. Position the helmet on your head and tilt it forward until the front of the helmet is two fingers above the bridge of your nose.
2. Straighten and fasten the helmet straps ensuring a snug fit. A 'V' should be created by the straps just under each ear.
3. When done up the helmet should allow the rider to place no more than two fingers between the chin and chin strap.

When purchasing a new helmet also consider the following:

- How heavy the helmet is on your head
- Are the straps easily adjusted
- Does the helmet have a pinch guard to stop the skin being pinched when doing the helmet up
- Is the helmet brightly coloured make you visible on the road
- Is a sun visor attached to the helmet
- Does the helmet have good ventilation
- Are adjustment pads included with the helmet to ensure the best fit

When should you purchase a new helmet:

- When the helmet no longer fits properly
- If it has been involved in an accident
- If it shows signs of cracking or pieces missing in the outer or inner shell or foam lining
- If it shows signs of wear and fraying to straps and when a buckle is damaged

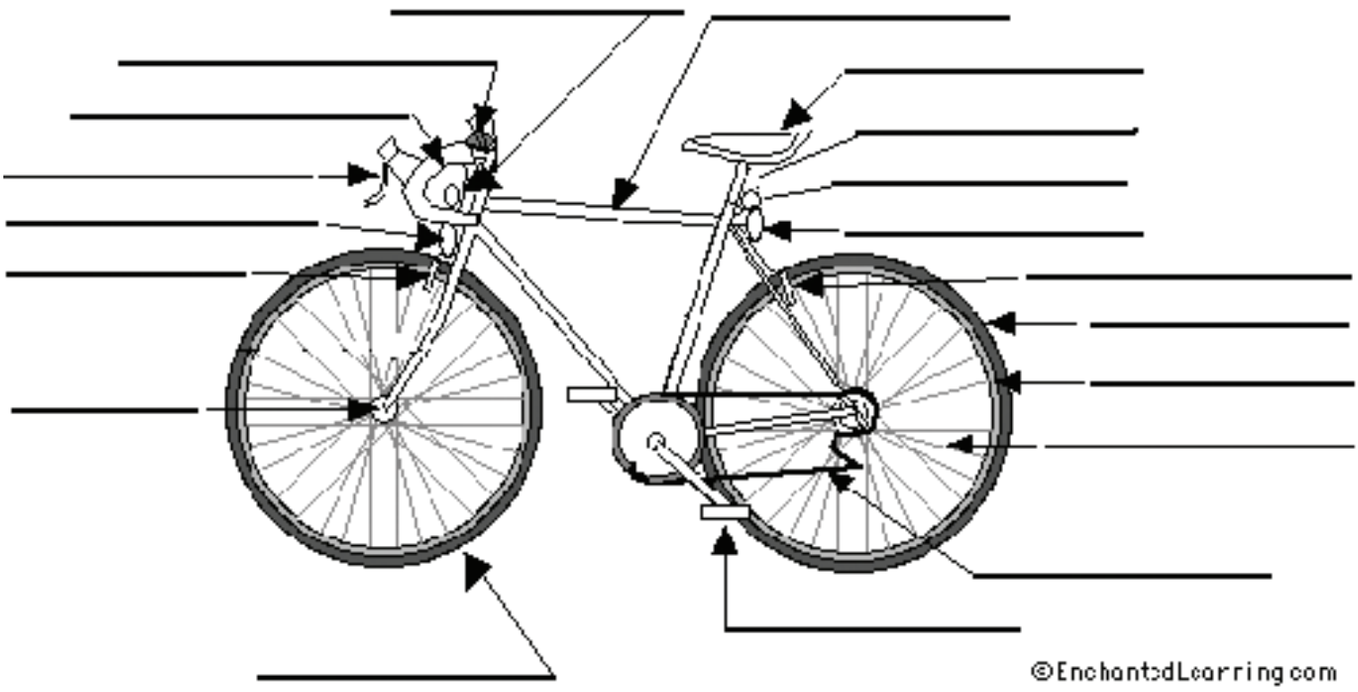
Do you know that wearing an approved helmet could reduce your head injury in the event of a bicycle crash by up to 60 per cent (NSW Roads and Traffic Authority, 2009)

Never wear a hat or beanie under the helmet as this will affect the correct fitting of the helmet on the riders head.

ACTIVITY 4.1

Bike Parts to Check Before Cycling

Use the bike part descriptions below to label the bike parts, you should always check and maintain before going for a ride.



Seat - check the seat is at the correct height. Riders should be able to straddle the bicycle and place both feet flat on the ground

Seat post - check that the post that supports the seat is tightly inserted at least 5cm into the frame.

Brake lever - the hand lever used to activate the brakes. Squeeze the front brake lever and try to wheel the bicycle forward. The front wheel should not turn and the brakes should contact the rim squarely . Repeat for the back brake and try to wheel the bicycle forward. The back wheel should not turn.

Brake (front and back) - The brake is on the frame and squeezes the tyre to stop the bike. Ensure the brake squeezes the tyre and that the bike can't be moved forward when the front and back break lever is applied.

Pedal - ensure pedals are not loose or broken and that they spin freely. If you have a foot brake press down on the pedal with one hand and try to push the bike forward with your other hand. The bike wheel should not turn

Handlebars - Ensure handle bars are tight and do not wiggle from side to side, forward or backwards. They should be covered with grips.

Bell/Horn - ensure the bell or horn is in good working order.

Front Light - a bright white light should be attached to the front of the bike and be clearly visible from the front for at least 200m if riding at night or in hazardous weather conditions

Back Light - a bright red light should be attached to the back and be clearly visible for at least 200m if riding at night or in hazardous weather conditions

Reflectors (front and back)– ensure reflectors are clean and clearly visible

Wheel - Check that they both Spin freely

Wheel Nuts - ensure wheel nuts are not loose or broken

Wheel Chain - clean and lubricate the chain

Wheel Spokes - check wheel spokes and eyelets for rust and damage

Wheel Rim - the rim supports the wheel. Check that it is free from rust, dents, and buckles.

Wheel Hub - the central part of a wheel. Check there is no rust or damage.

Tyre - ensure tyres are firm to touch and there is no wear or splits in the rubber. The correct tyre pressure is written on the wall of tyres..

Frame - ensure there is no rust or damage.

ACTIVITY 4.2
Cycling Safety Quiz

Fill out the questions below to learn how to ride your bike safely:

1. Before riding a bike, what safety equipment and items do you need to prepare?

2. How would you prepare yourself before going for a ride?

3. Name three items on your bike you should check before going for a ride:

4. What should you be wearing when riding a bike:

5. How do you know when your helmet is fitted correctly?

6. What additional safety equipment should you use when riding at night?

7. What hand signals should you give when:

a) stopping _____

b) making a turn _____

c) changing lanes _____

8. How should you cross pedestrian crossings and signalised intersections?

9. What are the safety risks if you wear ear phones while riding a bike?

10. If you are riding two abreast with someone else on the road what is the safe distance to be apart?

11. What are some of the other things you should do to ensure your riding your bike safely?

ACTIVITY 4.3
Bicycle Safety Equipment

How do each of these pieces of equipment help to keep you safe while riding a bike?

Helmet:

_____

Enclosed Footware (remember to tuck in your shoe laces!):

_____

Reflectors:

_____

Bell/Horn:

_____

Bike Light:

_____

Bright Clothes/Reflective Vest:

_____

Sunscreen:

_____

Drink Bottle:

_____

Did you know that wearing an approved helmet could reduce your head injury in the event of a bicycle crash by up to 60 percent? (NSW Roads and Traffic Authority, 2009)

WEBSITES & RESOURCES

For more information on Cycling Safety refer to the following websites and resources:

- RTA Bicycle Riders Handbook: www.rta.nsw.gov.au/usingroads/downloads/bicycle_riders_handbook.pdf
- Other RTA bicycle material can be found at: www.rta.nsw.gov.au/usingroads/bicycle/index.html
  www.bicycleinfo.nsw.gov.au
- TravelSmart Teacher Resource Kit: www.travelsmart.gov.au/teachers/index.html
- RTA Bicycle Safety Education Kits for primary school students in the Hunter Region are available from Department of Education, Adamstown Phone: (02) 4904 3928.

ACTIVE TRAVEL SURVEY 5
Teachers Resource

AIM

To investigate the historical, social, and cultural aspects influencing the way people travel to school and how this differs on a generational level.

This activity has been adapted from material from the website: www.ride2school.com.au

CURRICULUM OUTCOMES:

Key Learning Area	Syllabus Outcomes Addressed
Human Society and its Environment	ENS3.6
Science and Technology	INV S3.7

INSTRUCTIONS:

Activity 5.1: Active Travel Survey:

1. Show students how to measure the approximate distance they travel to school, using a ruler and a local map with a scale. Students could use the Maitland Cycleway Map or a web based resource such as www.whereis.com. If students have completed Activity 1.1 of this workbook they will already have this answer.

2. Students complete the:
   - Active Travel Student Survey (in class) (30min)
   - Active Travel Parent Survey (at home) (30min)
   - Active Travel Grandparent Survey (at home) (30min)
     (Students interview a parent and grandparent or choose people fromtheir parents and grandparent's generations).

3. FOLLOW-UP DISCUSSION:

   Discuss the similarities and differences that have become evident from completing the surveys for example:
   - Discuss changes in modes of travel/transport over time.
   - Why have people chosen particular ways to travel?
   - What distances did people of different generations actively travel to school?
   - What were some positive aspects of active travel highlighted by the older generations? Do they make active travel seem more attractive for this generation?
   - How might travel differ for future generations?
   - Explore reasons why people may have felt different depending on their mode of travel in the morning.
   - Parents and grandparents who went to primary school overseas may also provide interesting topics for discussion, such as ice skating and skiing to school, or use of different cycling laws.
   - Students select one of the short stories from their surveys to share with the class or with a small group of peers.

ACTIVE TRAVEL SURVEY - TABLES & GRAPHS

Teachers Resource 5

AIM

To compile Active Travel Survey data in a table and graph format to display the different modes of transport used by people from three generations.

CURRICULUM OUTCOMES:

Activity 1.1 - Planning a Safe Bicycle Trip in Maitland

Key Learning Area	Syllabus Outcomes Addressed
Human Society and its Environment	ENS3.6
Personal Development, Health and Physical Education	INV S3.7
Mathematics	WMS3.5

Activity 1.2 - Traffic Signs and Signaling Around Maitland

Key Learning Area	Syllabus Outcomes Addressed
Personal Development, Health and Physical Education	SLS3.13

EQUIPMENT

- Students require their three COMPLETED Active Transport Surveys from Activity 5.1
- Activity Sheet 5.2.

INSTRUCTIONS

ACTIVITY 5.2 - Active Travel Survey Part 2 – Tables & Graphs

1. This activity looks at comparing the different modes of travel across three generations by putting class data collected for the Active Travel Survey - Question 3: How do you travel to school? - into tables and graphs.

   Firstly, ask students to look at how they, their parents and grandparents travelled to school (Question 3, Active Travel Survey, Activity 5.1). Ask the students to predict which generation will have the highest number of active travellers and to record their answers on Activity Sheet 5.2.

2. Explain to students that by placing survey results for Question 3 (Activity 5.1) into a table and creating a graph, they will be able to work out which generation had the most active travellers.

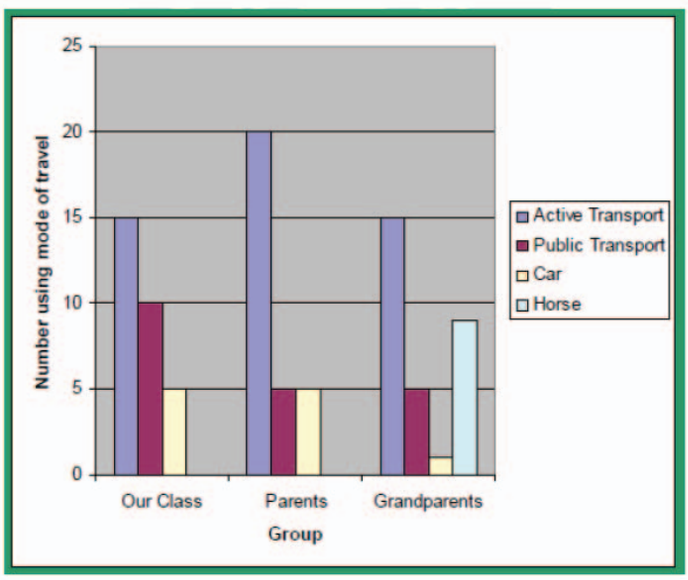
   First, the class data needs to be collected and entered into the table template provide in Activity 5.2. To collect the class data ask students to raise their hands when you call out the mode of travel they recorded for Q3 for each survey. The different travel modes for each generation's survey are outlined below for teacher reference:

   - Student Survey: Bike, walk, rollerblades, skateboard, bus, train, car.
   - Parent Survey: Bike, walk, skates, skateboard, bus, train, ferry, tram, car.
   - Grandparent Survey: Bike, walk, skates, horse, horse & cart, bus, train, ferry, tram, car.

Count the number of students with their hands up for each mode of travel. Students write the totals in their tables under the correct categories (see example table below).

MODE OF TRAVEL	OUR CLASS	PARENTS	GRAND PARENTS
ACTIVE TRAVEL (bike, walk, scooter, skateboard, skates, rollerblade)	15	20	15
PUBLIC TRANSPORT (bus, train, tram, ferry)	10	5	5
CAR	5	5	1
HORSE (horse, horse & cart)	0	0	1

3. Students can now transfer the totals from the table onto the graph template, using a ruler and coloured pencils to represent the different modes of travel (active, public transport, car, horse).



4. Students read the graph to work out the most and least common modes of travel for each generation. They write these results into the spaces provided directly below the graph on their activity sheets and fill out the associated questions, which are similar to the suggested discussion topics below.

5. FOLLOW-UP DISCUSSION:

- Compare students' predictions about which generation would have the highest number of active travellers with the results displayed on the graph.
- Compare the most common and least common modes of travel for each generation.
- Identify and discuss historical and societal changes influencing the most common and least common modes of travel for each generation.

ACTIVE TRAVEL SURVEY - One Month Later

Teachers Resource 5

AIM

This is a follow-up activity that can be completed one month after the activities in this workbook have been delivered to the class. The aim is to measure whether students now actively travel to school, for example by cycling or walking, as a result of completing the activities and lessons in this workbook.

As an option, after finishing this activity, you may like to provide the results to Maitland City Council so they can measure the success and uptake of this program. If you wish to do so please fill out the attached Program Feedback Form of this Workbook, and return it to Maitland City Council.

CURRICULUM OUTCOMES:

Activity 5.3 - Active Travel Survey – One Month Later

Key Learning Area	Syllabus Outcomes Addressed
Human Society and its Environment	ENS3.6
Science and Technology	INV S3.7
Mathematics	WMS3.5; NS3.3

INSTRUCTIONS

Activity 5.3 - Active Travel Survey – One Month Later

1. Ask students to fill out Questions 1 on Activity Sheets 5.3.

2. Ask students to fill out Questions 2 on Activity Sheets 5.3.

3. Ask the class to hold up their hands as you call out the following questions and to record their answers in the spaces provided for Question 3, Activity Sheets 5.3:

    a. How many students in the class have changed their behaviour and now actively travel to school, for example by cycling or walking, since completing the Let's Cycle to School and Clear Maitland's Air! Workbook?_____

    b. How many students travelled to and from school this week using:

    - Active transport (walk, ride, skateboard etc)_____
    - Public transport _____
    - Car_____
    - Number of students in the class _____
      (If a student travelled to school using different transport modes on different days ask them to raise their hand only once for the travel mode they used most often).

4. Question 4 on Activity Sheet 5.3 will help students compare today's class travel survey results with last month's survey results to find out if students have changed their behaviour because of what they learnt about cycling and active transport last month.

   Ask students to fill out Table 1 with the class travel data collected last month (just the student survey results for Question 2, Activity 5.2, leave out the parent and grandparent results). Using this data they can then work out the fraction, percentage and rank for each travel mode. This will help them identify which transport mode is used the most by the class. An example table is provided below. Ask students to repeat this exercise for Table 2 using the class data collected today (Question 3 (b), Activity Sheet 5.3).

	Active Transport (walk, ride, skateboard, scooter, rollerblade, rollerskate)	**Public Transport** (bus, train)	**Car** (car, truck, motorbike)	**Total**
Number	8	12	15	35
Fraction	8/35	12/35	15/35	1
Percentage	23%		43%	100%
Rank	3	2	1	

5. Ask students to compare the results in the two tables and use the information to fill out the answers to Question 5, Activity Sheet 5.3. These questions are replicated below and might be useful for a follow-up class discussion:
   a. Which forms of travel have increased since last month?
   b. Which have decreased?
   c. Write some sentences to express these changes. eg. Since last month the number of students riding to school has increased by 8%.
   d. Write a sentence about any change in the percentage of students using active travel and why this might be:

ACTIVITY 5.1
Active Travel Survey

ACTIVE TRAVEL STUDENT SURVEY

1) Where is your school located? _____

2) How far from school do you live? _____ km/m

3) How do you usually travel to school? (Circle)

- Ride a bike - Scooter - Skateboard - Roller blade or roller skate - Walk

- Bus - Train - Car - Other: _____

4) Why do you travel that way? _____

5) How long does it usually take you to travel to school? _____

6) Do you enjoy travelling to school this way? _____

7) Why or Why not? _____

8) How do you usually feel when you arrive at school in the morning? (Circle)

- Sleepy - Wide Awake - Grumpy - Happy - Energetic

9) How often do you walk to school? _____ Per: Week Month Year

10) How often do you ride to school? _____ Per: Week Month Year

11) If you do not ride or walk to school regularly, what would help you to do this? _____

_____

_____

12) Do you have an interesting story from your experiences travelling to school?

_____

_____

_____

_____

Draw a picture of yourself travelling to school (Optional)

ACTIVITY 5.1
Active Travel Survey

ACTIVE TRAVEL PARENT SURVEY

Interview one of your parents to find out how they travelled to school. Ask the following questions.

1) Where was your primary school located? _____

2) How far did you live from your primary school? _____km/m

3) How did you usually travel to school? (Circle)

- Ride a bike - Scooter - Skateboard - Roller blade or roller skate - Walk - Ferry (Boat)
- Tram - Bus - Train - Car - Other: _____

4) Why did you travel to school this way? _____

5) How long did it usually take you to travel to school? _____

6) Did you enjoy travelling to school this way? _____

7) Why or Why not? _____

8) How did you usually feel when you arrived at school? (Circle)

- Sleepy - Wide Awake - Grumpy - Happy - Energetic

9) How often did you walk to school? _____ Per: Week Month Year

10) How often did you ride to school? _____ Per: Week Month Year

11) Do you have an interesting story from your experiences travelling to primary school?

_____

_____

_____

STUDENT OBSERVATIONS

Is the way that you travel to school similar or different from the way your parent once travelled to primary school?
(Circle) DIFFERENT OR SIMILAR

Please describe the similarities or differences:

_____

_____

_____

ACTIVITY 5.1
Active Travel Survey

ACTIVE TRAVEL GRANDPARENT SURVEY

Interview a grandparent (or somebody much older than your parents) to find out how they used to travel to school. Ask the following questions.

1) Where was your primary school located? _____

2) How far did you live from your primary school? _____km/m

3) How did you usually travel to school? (Circle)

- Ride a bike - Scooter - Skateboard - Roller blade or roller skate - Walk - Ferry (Boat)
- Tram - Bus - Train - Car - Horse - Horse and Cart
- Other: _____

4) Why did you travel to school this way? _____

5) How long did it usually take you to travel to school? _____

6) Did you enjoy travelling to school this way? _____

7) Why or Why not? _____

8) How did you usually feel when you arrived at school? (Circle)

- Sleepy - Wide Awake - Grumpy - Happy - Energetic

9) How often did you walk to school? _____ Per: Week Month Year

10) How often did you ride to school? _____ Per: Week Month Year

11) Do you have an interesting story from your experiences travelling to primary school?

_____

_____

_____

STUDENT OBSERVATIONS

Is the way that you travel to school similar or different from the way that your grandparent once travelled to primary school? (Circle) DIFFERENT OR SIMILAR

Please describe the similarities or differences: _____

_____

ACTIVITY 5.2

Active Travel Part 2 – Tables and Graphs

Now that you have completed your Active Travel Surveys you can now workout which generation had the most active travellers by putting the class results into a table and graph.

1. Firstly, have a look at how you, your parents and your grandparents travelled to school by looking at the answers you wrote down for Question 3 in each of your surveys (your survey, your parent's and grandparent's). Which generation do you think will have the highest number of active travellers?

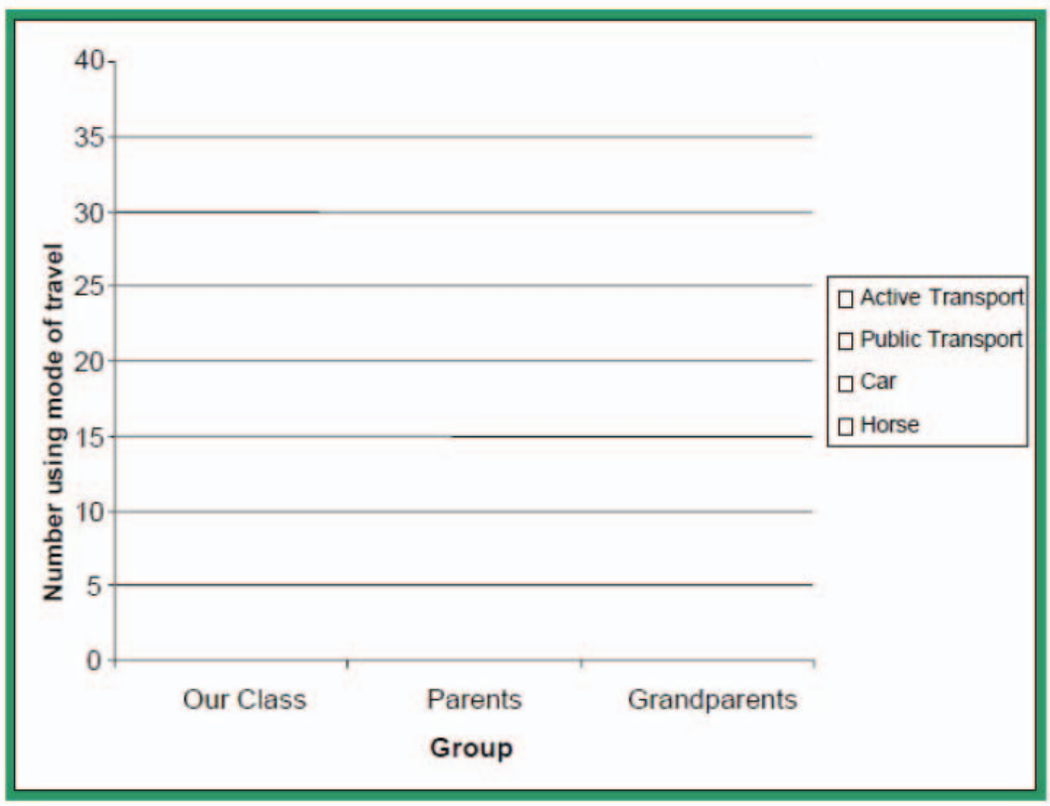
2. Now it is time to collect the class results and find out which generation were the most active when travelling to school. Put up your hand when the teacher calls out the mode of transport you, your parents and your grandparents used to travel to school (Q3 on your surveys). The teacher will add up the class results and call out the number of people that used active transport, public transport, car or horse for each generation. Write the class results in the table below.

Mode of Travel	Our Class	Parents	Grand Parents
Active Travel (bike, walk, scooter, skateboard, skates, rollerblades)			
Public Transport (bus, train, tram, ferry)			
CAR			
HORSE (horse, horse & cart)			

ACTIVITY 5.2

Active Travel Part 2 – Tables and Graphs

3. Now transfer the totals from the table above onto the graph below, using a ruler and coloured pencils to represent the different modes of travel (active, public transport, car, horse).



4. Have a look your results in the graph and answer the following questions?

What was the most common mode of transport used by the class? _____

What was the least common mode of transport used by the class? _____

What was the most common mode of transport used by parents? _____

What was the least common mode of transport used by parents? _____

What was the most common mode of transport used by grandparents? _____

What was the least common mode of transport used by grandparents? _____

Which generation had the most active travellers?_____

Why do you think this generation is the most active? Have a think about how people and technology have changed through history? _____

ACTIVITY 5.3

Active Travel Survey – One Month Later

Congratulations on completing the *Let's Cycle to School and Clear Maitland's Air!* workbook. Hopefully you learnt a lot about the benefits of cycling and being active on the way to and from school. But have you changed your behaviour and started cycling or walking to school because of what you learnt? Do you know of anyone in your class that has? This activity will help you find out whether the students have changed their behaviour because of what they learnt about the benefits of cycling and active travel.

1. Have you started actively travelling to school, for example by cycling or walking, since completing the *Let's Cycle to School and Clear Maitland's Air!* workbook? _____

   Provide a reason for your answer _____

   _____

2. How did you travel to and from school this week?: _____

3. Your teacher will help you collect the following data by taking a survey of the class. Record the answers from the class survey in the spaces below:

   a. How many students in your class have changed their behaviour and now actively travel to school, for example by cycling or walking, since completing the *Let's Cycle to School and Clear Maitland's Air!* Workbook?

      _____

   b. How many students in your class travelled to and from school this week using:

      - Active transport (walk, ride, skateboard etc) _____
      - Public transport _____
      - Car _____
      - Number of students in the class _____

ACTIVITY 5.3

Active Travel Survey – One Month Later

4. You can now find out if students in your class have changed their behaviour and are now actively travelling to school. You can do this by comparing last month's data with today's data. Fill out Table 1 with the Class Travel Survey results you recorded last month (Question 2, Activity 5.2). Calculate the percentage and rank of the different transport modes to find out which one was the most used. Repeat this exercise by filling out Table 2 with the Class Travel Survey results you recorded today (Question 3, (b) above).

Table 1: Last Month's (Date:_____) Class Travel Survey Results

	Active Transport (walk, ride, skateboard, scooter, rollerblade, rollerskate)	**Public Transport** (bus, train)	**Car** (car, truck, motorbike)	**Total**
Number				
Fraction				1
Percentage				100%
Rank				

Table 2: Today's (Date:_____) Class Travel Survey Results

	Active Transport (walk, ride, skateboard, scooter, rollerblade, rollerskate)	**Public Transport** (bus, train)	**Car** (car, truck, motorbike)	**Total**
Number				
Fraction				1
Percentage				100%
Rank				

ACTIVITY 5.3

Active Travel Survey – One Month Later

5. Look at the results in the two tables above and use the information to answer the following questions:

   a. Which forms of travel have increased since last month?

   _____

   b. Which have decreased?

   _____

   c. Write some sentences to express these changes. eg. Since last month the number of students riding to school has increased by 8%.

   _____

   _____

   _____

   _____

   _____

   d. Write a sentence about any change in the percentage of students using active travel and why this might be:

   _____

   _____

   _____

   _____

   _____

PROGRAM FEEDBACK FORM

To assist Maitland City Council in measuring how successful this program has been at generating student awareness, interest and uptake of cycling and active transport in Maitland, please fill out the following form and return it to:

Environmental Programs
Maitland City Council, PO Box 220, Maitland NSW 2320

1. After completing Activity 5.1-5.3 in this workbook with your class please answer the following questions:

   a. How many students in your class started actively travelling to school, for example cycling or walking, as a result of completing the *Let's Cycle to School and Clear Maitland's Air!* Workbook? _____.
   Number of students in the class:_____

   b. How many students travelled to school on _____ (last month's date) by:

   - Active transport (walk, ride, skateboard etc)_____
   - Public transport _____
   - Car_____
   - Total number of students in the class on this day:_____

   c. How many students travelled to school on _____ (today's date) by:

   - Active transport (walk, ride, skateboard etc)_____
   - Public transport _____
   - Car_____
   - Total number of students in the class on this day:_____

   d. Please explain why you think students did or did not change their behaviour as a result of completing the *Let's Cycle to School and Clear Maitland's Air!* workbook?

   _____

   _____

   _____

   _____

   e. What else could be done to encourage students to actively travel to school, for example educational programs, improved safety, more bike paths?

   _____

   _____

   _____

2. Did you find this Workbook useful?

3. What did you find most useful?

4. What aspects of the Workbook do you feel need changing or improving?

5. What other resources and information would you find useful?

6. Other comments?