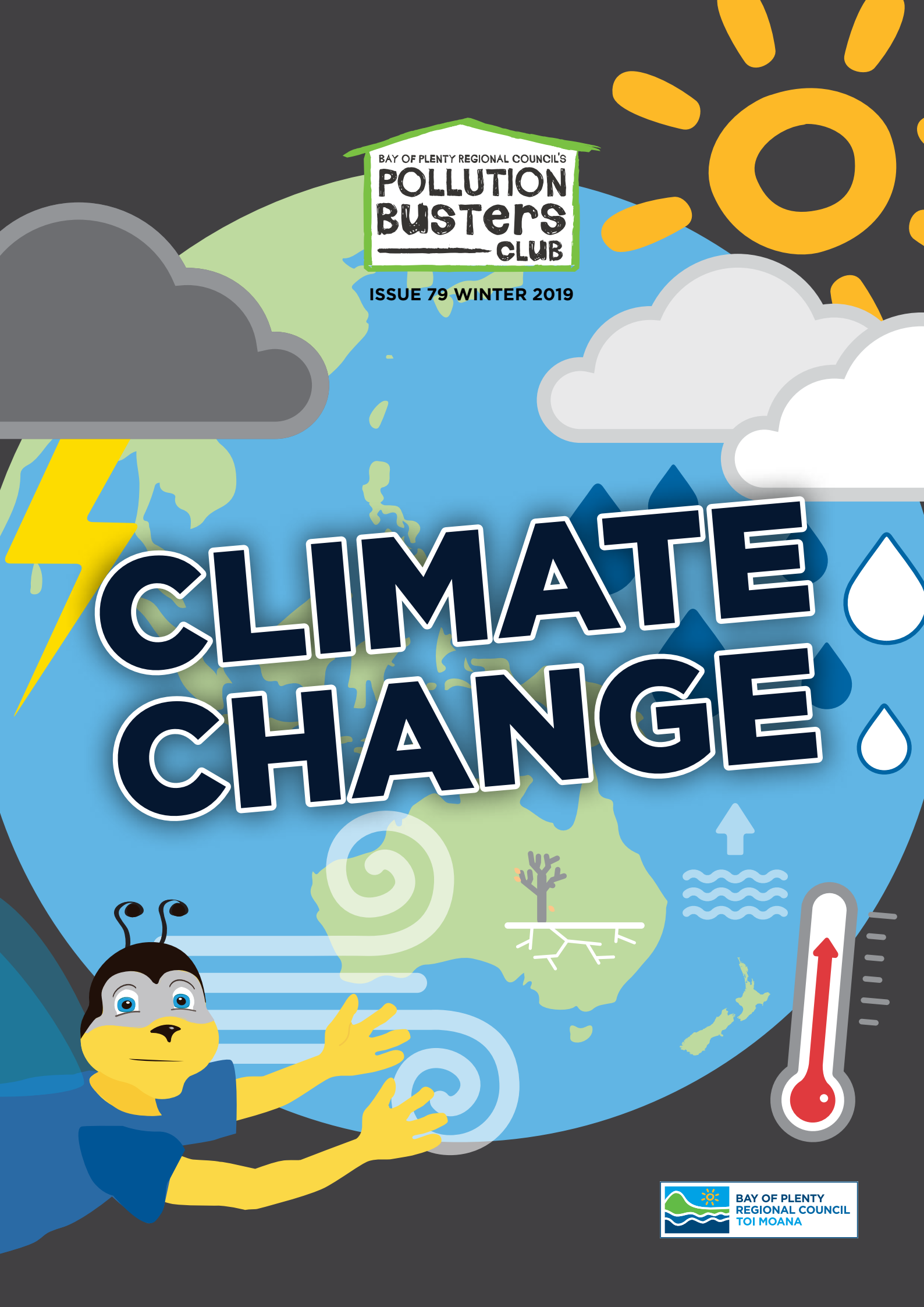
BAY OF PLENTY REGIONAL COUNCIL'S

POLLUTION BUSTERS CLUB

ISSUE 79 WINTER 2019

CLIMATE CHANGE



BAY OF PLENTY REGIONAL COUNCIL
TOI MOANA

Kia ora Pollution Busters

The sun is in this newsletter in 13 places, can you find them all?

Wow, this term flew by! BuzzBOP and the team hope you had a great term at school and worked and played hard!

Thanks to all the Pollution Busters who returned the planning feedback form, it was great hearing what you liked and what you want more of in this newsletter!

Climate change affects us all, so in this issue we will look at what it is, what is happening, and how you can help. Remember that every thing you do DOES help, no matter how small it is.

Check out page 11 for the new competition. Remember you have to be in to win so get your entry in!

BuzzBOP loves reading the mail so keep sending in your photos, artwork, letters and stories as we would love to put them in our newsletter.

Have a great holiday and term at school!

Tiakina tona a Ranginui rāua ko Papatūānuku – keep protecting our sky father and earth mother.

From BuzzBOP and the Pollution Busters team at Bay of Plenty Regional Council

BuzzBOP's mail

BAY OF PLENTY REGIONAL COUNCIL TOI MOANA

Send BuzzBOP your photos, stories, and art! *Remember to include your name, age and address on the back.*

Send your drawings, photos, letters and competition entries to:

POST: Bay of Plenty Regional Council
Pollution Busters Club
Freepost 122076
PO Box 364
Whakatāne 3158

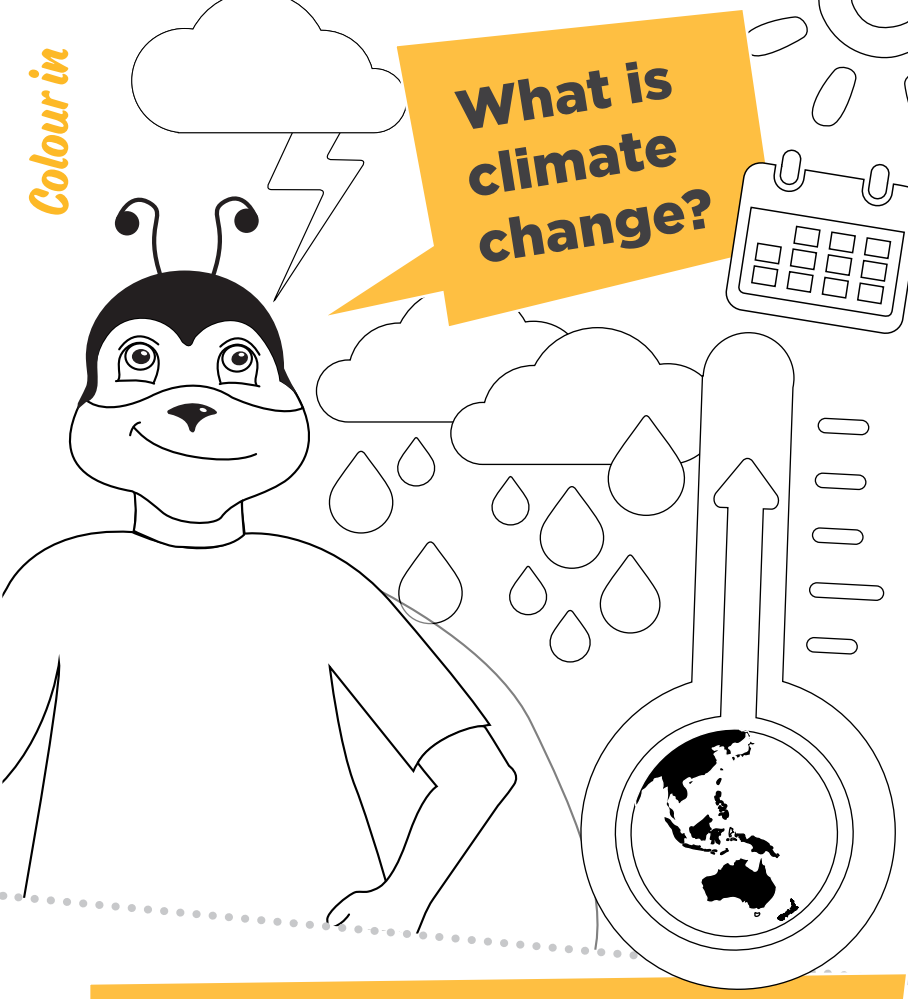
EMAIL:buzzbop@boprc.govt.nz

Things you told us... Pollution Busters want more:

- **Colouring**
- **Puzzles**
- **Activities**

Welcome to new Pollution Buster Sofie Longmore

Colour in



What is climate change?

climate
āhuarangi

The weather conditions and temperature in a place over a long time (years)

change
panoni

The process where something becomes different

Climate change is the change in temperature and weather patterns on earth over a long time.

Why is the climate changing?

Earth's climate can change naturally, but human behaviour producing too many **greenhouse gases** *(see page 4)* is causing the planet to heat up rapidly (**global warming**).

Does it mean we will just have warmer weather?

No! The bad news is that the rising temperatures don't just mean it will be warmer! Everything is connected, so the changing temperature will make our weather more extreme and unpredictable.

Why does it matter?

Climate change matters because it impacts lots of things, like our water, where people can live, how we grow food, and how animal habitats survive.

We need to take action to reduce our carbon footprint *(see page 8)* and make plans to adapt and be prepared for our changing climate.

Match the words to their meanings:

1 **weather**	A the planet heating up
2 **climate**	B the process where something becomes different
3 **global warming**	C the weather conditions in a place over a long amount of time
4 **change**	D heat-trapping gases
5 **greenhouse gases**	E the daily state of the atmosphere (like raining or sunny)

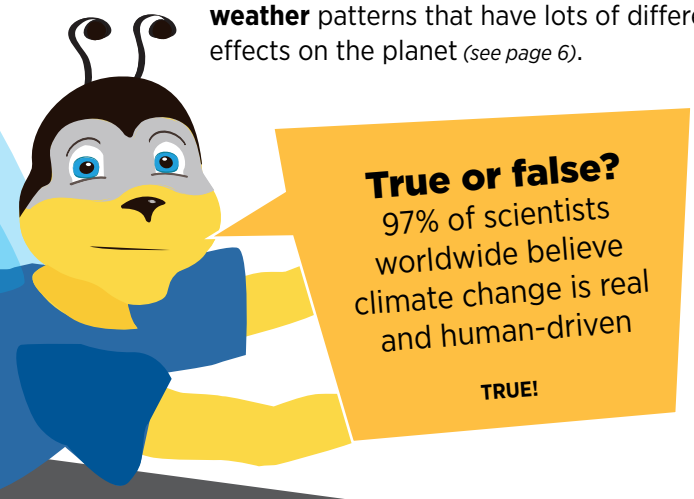
Answers 1E, 2C, 3A, 4B, 5D

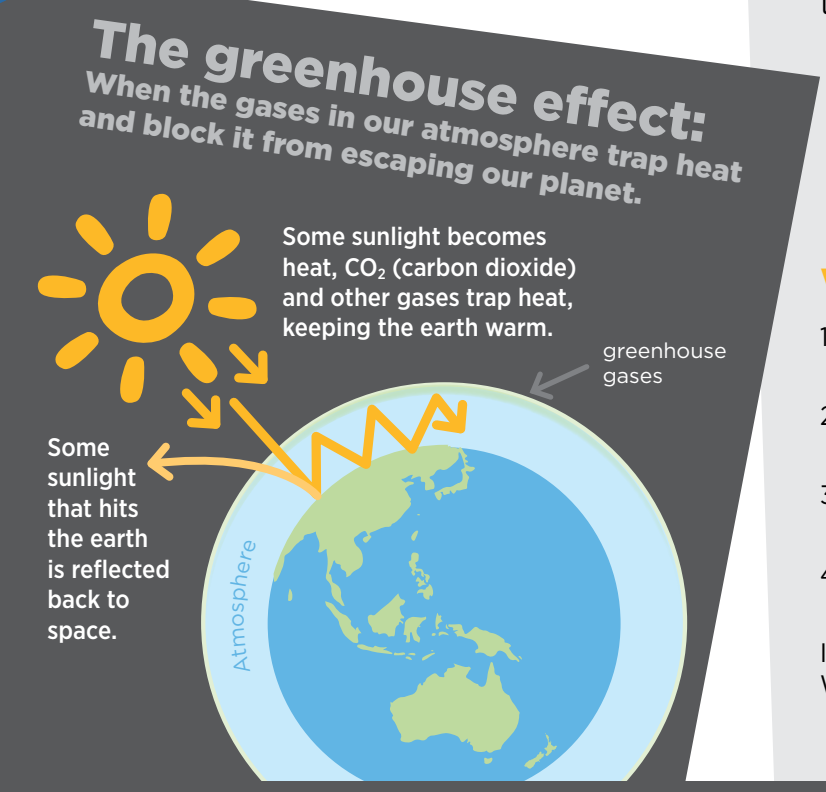
Greenhouse gases and global warming

Earth's **atmosphere** (the air that covers the earth) is made up of **oxygen**, **nitrogen** and some greenhouse gases (like carbon dioxide and methane).

Greenhouse gases act like a blanket and stop the **heat** from the **sun** escaping into space. They make life on **earth** possible, and without them, too much heat would escape and the **planet** would freeze. The system of trapping the heat in our atmosphere is called the greenhouse effect.

But too many **greenhouse gases** cause the earth to heat more, which is often called **global warming**. But it's better to think of it as **climate change**, because a warmer climate causes changes in **weather** patterns that have lots of different effects on the planet *(see page 6)*.





O	E	V	G	J	R	O	P	T	B	I	U	E	O	G
E	X	G	J	Q	N	D	L	I	R	Y	S	R	R	E
I	L	Y	N	Y	S	R	A	B	M	E	D	E	M	A
I	S	U	G	A	E	Q	N	J	D	J	E	H	S	R
X	G	Y	S	E	H	Y	E	Y	N	N	D	P	I	G
S	Q	Y	C	C	N	C	T	Q	H	U	M	S	N	Z
D	G	V	I	H	N	H	E	O	K	N	D	O	E	V
N	N	O	O	X	E	V	U	T	E	N	Q	M	I	A
R	U	A	P	A	B	S	J	G	A	V	F	T	S	K
B	M	S	R	H	E	T	O	X	K	M	B	A	V	Y
A	K	T	K	G	N	R	Q	Q	S	S	I	S	T	W
F	H	R	A	P	T	F	R	H	K	I	B	L	X	E
C	R	S	L	I	U	Z	Z	Z	C	P	X	G	C	F
N	E	G	N	I	M	R	A	W	L	A	B	O	L	G
S	W	E	A	T	H	E	R	T	A	E	H	K	A	H

Can you find the **bold** *words in the wordfind?*

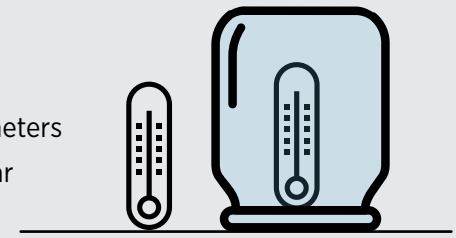
ACTIVITY:

The greenhouse effect in a jar

This activity will help you to understand how the greenhouse effect works.

You will need:

- a sunny day
- two small thermometers
- a large clear glass jar



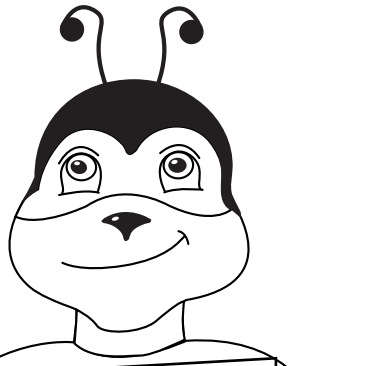
What to do:

1. Place the two thermometers side by side on the ground outside.
2. Record the temperature shown by each thermometer.
3. Cover one of the thermometers with the large jar. This is your greenhouse.
4. Read the thermometers after 30 minutes and then after an hour.

Is there a difference in temperature?
Why do you think this is?

Where do the greenhouse gases come from?

- Natural processes
- Human-made processes



For millions of years, **natural processes** produced just the right amount of greenhouse gases to keep the earth at a balanced temperature.

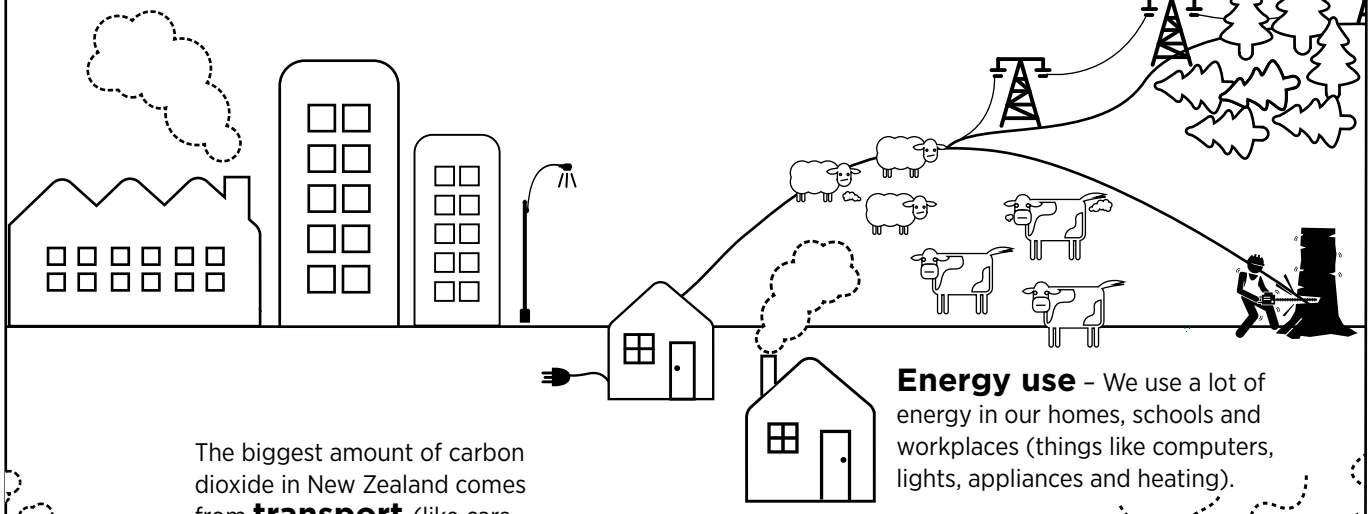
Because of human activities and the way we live, we now produce lots of greenhouse gases, throwing nature out of balance.

How big is your family's carbon footprint? do the activity on page 8.

Colour in

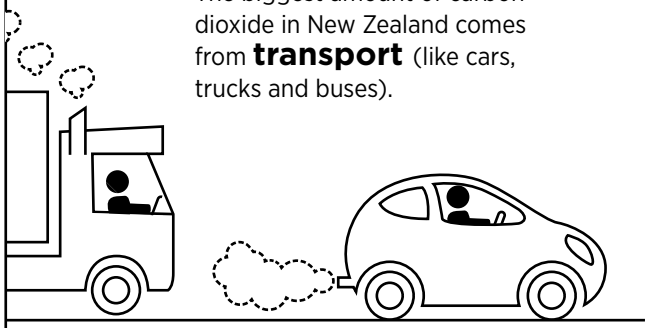
In modern life, our factories use a lot of electricity, in our homes and schools we create a lot of waste, farmers raise large numbers of sheep and cattle, and lots of trees are chopped down every day.

All of these things produce high levels of greenhouse gases, and as our population grows, so do the problems caused by these gases.

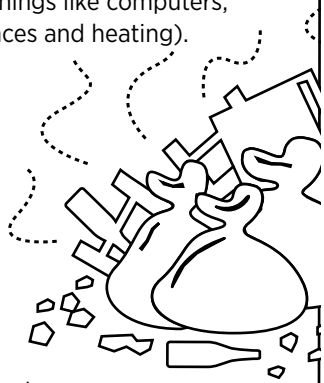


Energy use – We use a lot of energy in our homes, schools and workplaces (things like computers, lights, appliances and heating).

The biggest amount of carbon dioxide in New Zealand comes from **transport** (like cars, trucks and buses).

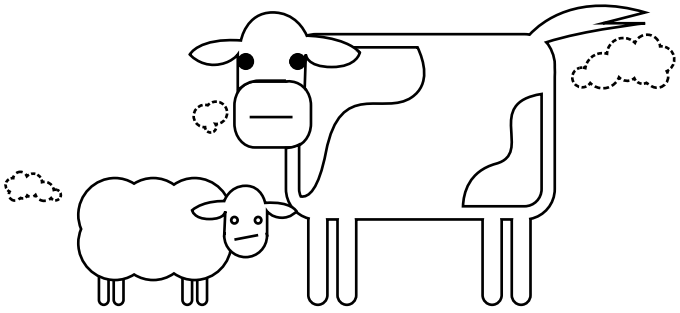


Landfills – the food and rubbish that ends up at the landfill decomposes and releases methane.

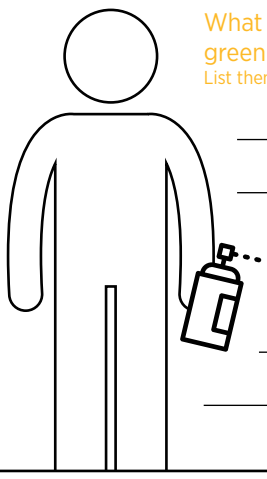


Gases from animals

There are about 10 million cows and 27 million sheep in New Zealand and every day they burp and fart methane (CH_4) into the air. That's a lot of greenhouse gases!



What other places do greenhouse gases come from?
List them here:

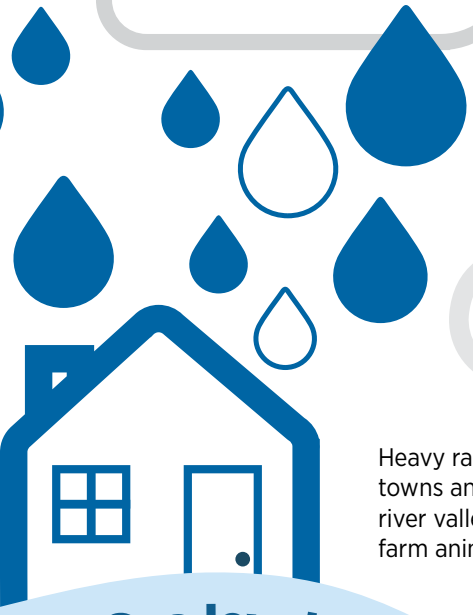


What are the impacts of climate change?

The earth getting warmer is causing changes to our moana (oceans), whenua (land) and kōhauhau (atmosphere). If things continue, the delicate balance that sustains life (including our own) could be in danger.

Animals might become endangered as their habitat disappears, lakes and streams could develop dangerous algae and make them unsafe for swimming and collecting kaimoana, and lots of the world's ice could melt, meaning the oceans and lakes will get higher, and we might have more flooding and severe weather events.

Average rainfall might increase



Ex-tropical cyclones might be stronger and bring heavy rain

Changing seasons – some might be drier or wetter than normal

Heavy rain could cause floods in towns and cities. Floods in low lying river valleys could destroy homes, farm animals and food crops.

Did you know?

Moturiki Island, off Mt Maunganui, show sea levels there have risen 11 centimetres since 1950, an average rise of 1.9 millimetres a year.

Sea level rise Some of the ice in the Arctic and Antarctic will melt into the sea. There will be increased coastal erosion and flooding.

Erosion is when natural forces like water and wind wear away earth.

Land and sea ice - sea level rise experiment

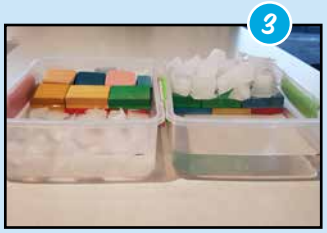
See what happens when sea and land ice melts, and how it affects sea level.

You will need:

- 2 containers the same size
- 2 pieces of clay or small blocks of wood
- ice cubes
- water

What to do:

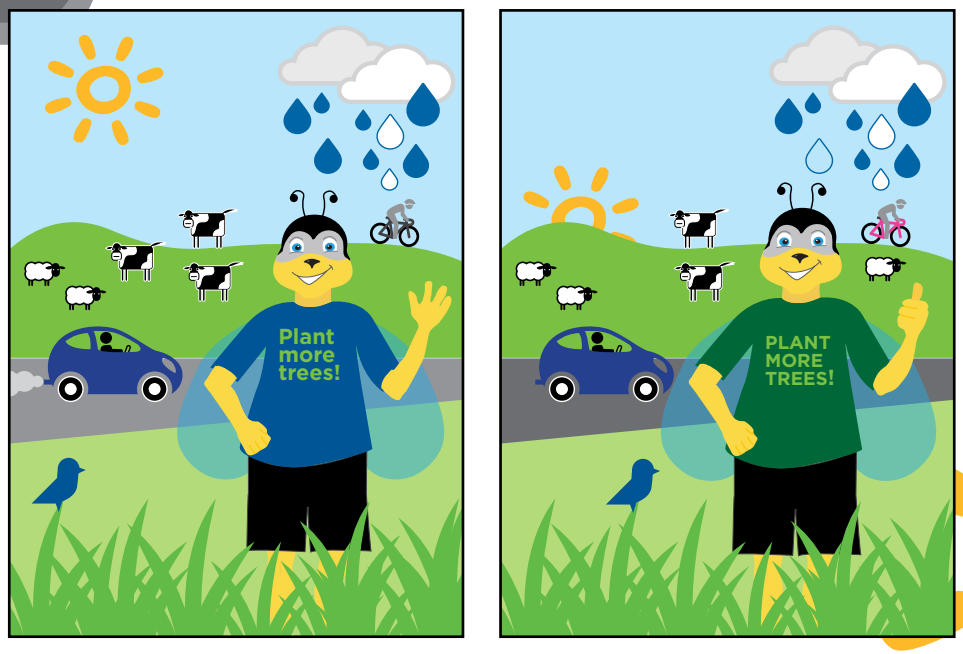
1. Use the clay or wood to represent land at one end of each container.
2. In one container put ice cubes on the 'land', and in the 'ocean' in the other
3. Fill each container to the same level with water (keeping it below the top of the land, but so the ice floats in the ocean)
4. Check the water level after the ice has melted - are they still the same or different ? Why do you think that is?



As the earth's temperature goes up, ice on land and in the sea begins to melt, making the sea level rise. But because water expands as it gets warmer the ocean actually expands, even without adding any water from the melting ice!

Spot the difference

There are 10 diffences in these pictures, can you spot them all?



We all know that climate change is happening. The challenge is what we do about it. Everyone can take action for climate change through:

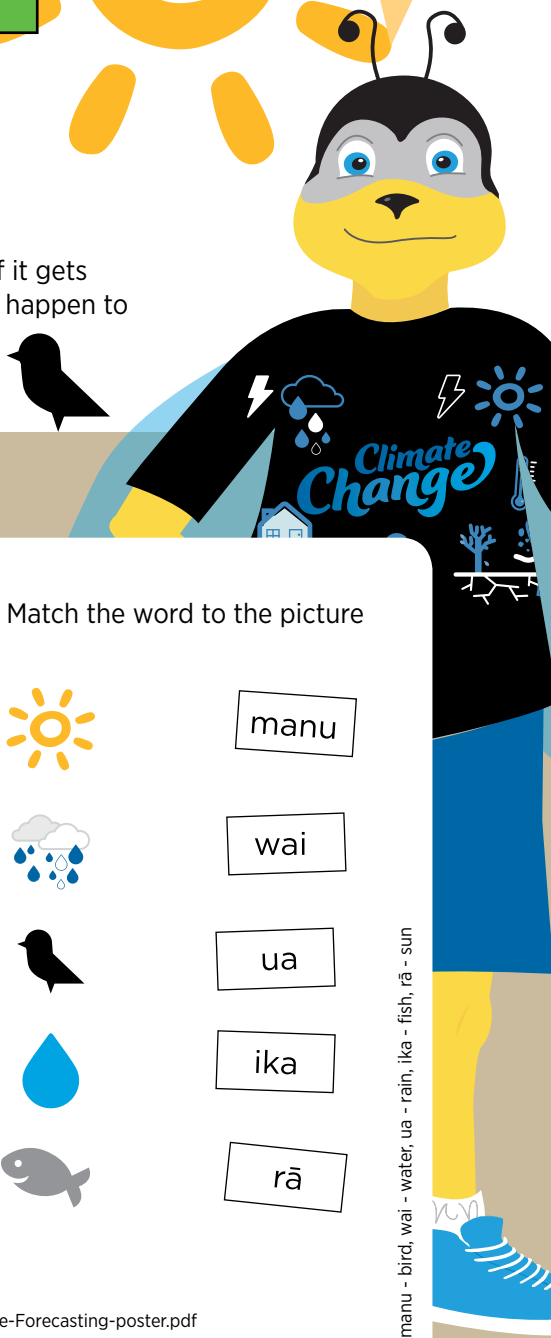
Adaption – being ready for rising sea levels, warmer temperatures, more storm events and increased coastal erosion and flood risk.

Mitigation (action of making it less serious) – reducing our greenhouse gas emissions so that long-term climate change impacts are less.

Some places may have more dry periods, called droughts

Droughts could turn some grass lands into desert bringing famine and starvation (not enough food).

Native plants are used to the climate they live in now. If it gets warmer some plants may die. What do you think could happen to the birds and insects that depend on these plants?



Mātauranga Māori

Māori knowledge and understanding

Māori consider themselves part of nature and over the centuries have gathered lots of knowledge about their local weather and climate. It helps to make decisions about when is a good time to plant, harvest and fish.

They use things happening in the environment to forecast changes, like when Whakaari's (White Island) white steam/gas cloud lies to the left - rain is coming; or when the birds act a certain way it tells them that a certain type of tree or flower will bloom, or the weather with change.

This knowledge can also help tell us what the climate was like in the past and can help along with science to plan for the future.

Match the word to the picture

manu

wai

ua

ika

rā

manu - bird, wai - water, ua - rain, ika - fish, rā - sun

Check out more Traditional Māori weather and climate forecasting:
www.niwa.co.nz/sites/niwa.co.nz/files/Traditional-Maori-Weather-and-Climate-Forecasting-poster.pdf

Indigenous peoples (first people who lived in any region) are more likely to experience the impacts of climate change because of their close relationship to and dependence on the natural environment.

Carbon footprint

Our carbon footprint shows how much of a negative impact we are having on the environment with the amount of greenhouse gases we produce.

What size is yours?

Let's look at our own everyday actions and how the way we live can have a positive or negative impact on our climate.

Choose a different colour pen for each of the following key areas and colour the circles.

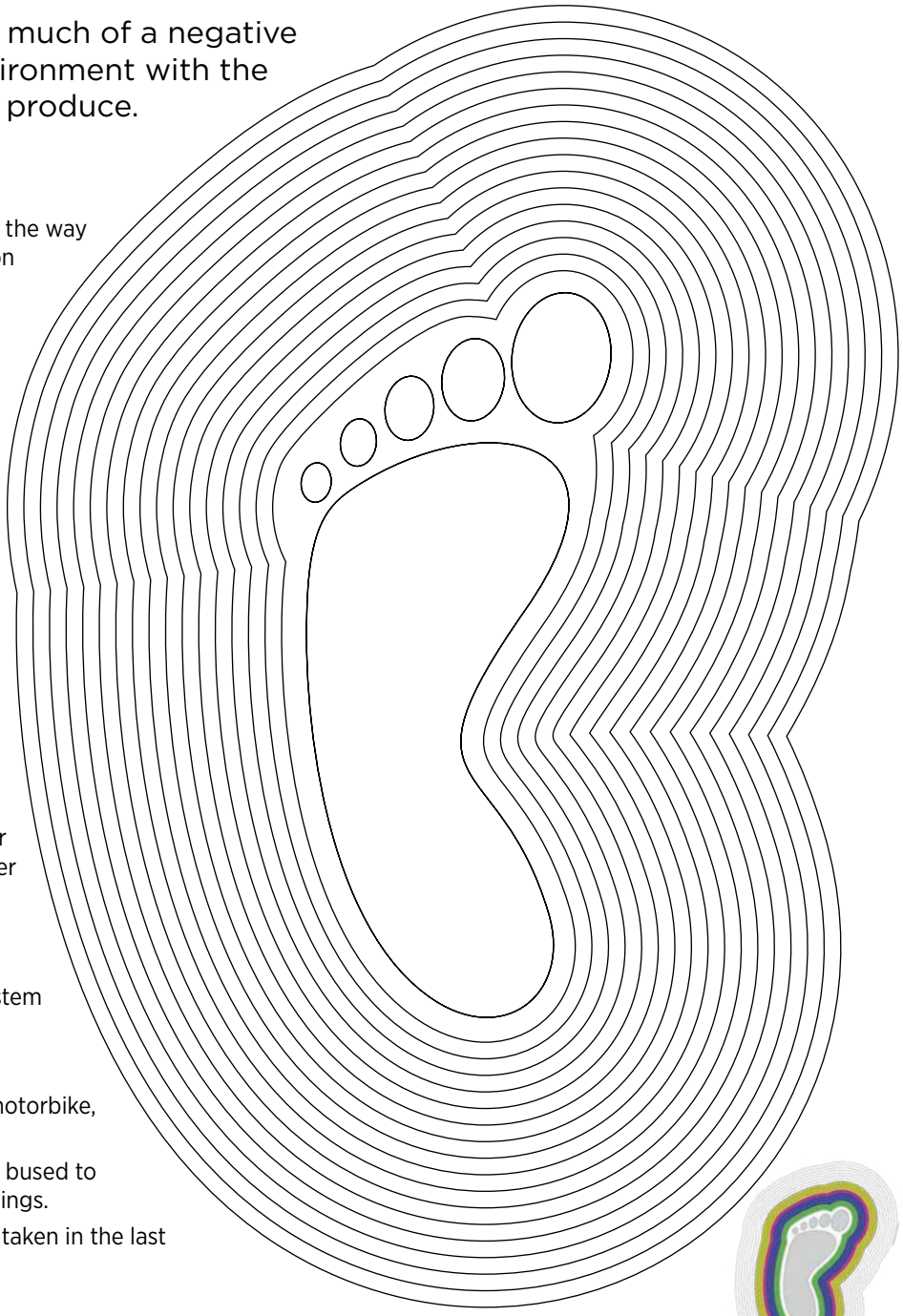
House and Home

Transport

Recycling and Rubbish

Personal Habits

Using the colour you chose for each area, follow the instructions below to colour the rings on the footprint, start at the centre and work your way out.



HOUSE AND HOME

1. If you live in a single-family home, colour four rings – If you live in an apartment, flat or other type of home, colour two rings.
2. If you don't use energy efficient lightbulbs at home, colour one ring.
3. Do you know what the Energy Star rating system is? If not, colour one more ring.

TRANSPORT

1. For every motor vehicle in your family (car, motorbike, van, truck etc.), colour one ring.
2. If nobody in your family has walked, biked or bused to school or work in the past week, colour two rings.
3. For every trip on an aeroplane that you have taken in the last year, colour one ring.

RECYCLING AND RUBBISH

1. If you recycle every week at your house, colour one ring. If you never recycle in your house, colour two.
2. If you don't have a compost bin or worm farm at home, colour one ring.

PERSONAL HABITS

1. If you are a vegetarian, colour one ring. If you are not, colour two. (more energy is needed for meat production and cows and sheep produce methane gas).
2. If you leave the tap on while brushing your teeth, colour one ring.
3. Have you or anyone in your family accepted a plastic bag from a shop in the last month? If yes, colour one ring.

How much of your footprint is coloured? Only a few rings? Most? About half? The more rings coloured, the more negative impact we are having. What can this tell us about our contribution to greenhouse gases and climate change? Are you surprised? Do you think there are things you could do better? How about the rest of your family, or at school?

DO A QUICK BRAINSTORM OF ACTIONS THAT COULD HELP REDUCE YOUR CARBON FOOTPRINT

Reduce your carbon footprint!

Find your way through the maze visiting **all** the ways to reduce your carbon footprint and help Papatūānuku.

START

Change your transport. Cycle or walk instead of using the car

Reduce wasting kai (food)

Shop sustainably Before buying something think - do i really need this? or will it end up as landfill one day

Take short showers instead of baths

Reduce energy use. Turn off and unplug electrical appliances when you are not using them.

Make your lunchbox litter free. Use reusable food wrap instead of plastic

Recycle, compost and worm farm!

Buy local instead of things that have travelled on trucks, trains or planes.

Grow your own fruit and veges

FINISH

Use less wai! Turn the tap off when brushing your teeth.

reduce
reduce
reduce

One of the best things we can do to make a positive difference to our climate and environment, and to reduce our carbon footprint, is to plant trees!

Basically, trees breathe in carbon – the bad stuff, and breathe out oxygen – the good clean stuff!

BuzzBOP's Friend

Fiona McTavish

Chief Executive – Bay of Plenty Regional Council Toi Moana

What do you do in your job?

I work with others to help people and the environment thrive in the Bay of Plenty. People who work for the Regional Council are passionate and committed to making a difference for our communities such as helping people respond and adapt to climate change.

What is the best part of your job?

The people that I work with and meet every day. So many people are interested in a thriving Bay of Plenty and in working together to respond to climate change opportunities and challenges. Lately, I have spent a great deal of time working on improving bus services in the Western Bay which is a key contribution that council makes to responding to climate change.

What path led you to this role?

Living in New Zealand with our world class education system was the start for me. I was able to go to university and get several qualifications that taught me how to think, learn and adapt to working with many different people to achieve success in my roles. Key for me is that many people believe in me and have supported me in my career.

What is your message to Pollution Busters?

All our little actions add up and you can personally make a difference to our region and our environment.

Climate change quiz - what would you do?

Circle the answer that best saves energy.

	A	B
1	Have a shower	Have a bath
2	Shower for 10 minutes	Shower for 3 minutes
3	Catch the bus to school	Take the car to school
4	Walk or bike to school	Catch the bus to school
5	Put paper in the rubbish bin	Put paper in the recycling bin
6	Leave a room, turn off the light	Leave the light on
7	Standard light bulbs	Energy efficient light bulbs

	A	B
8	Use the clothes dryer	Hang clothes outside to dry
9	Getting cold, turn on a heater	Getting cold, put on a sweatshirt
10	Getting dark, turn on all the lights	Turn on the light you need
11	Take a water bottle to school	Buy drink in a bottle or can
12	Getting cold, close the curtains	Leave curtains open
13	Cooking in a microwave	Cooking in pots on the stove
14	Washing dishes by hand	Using a dishwasher

How many did you get right? ANSWERS: 1A, 2B, 3A, 4A, 5B, 6A, 7B, 8B, 9B, 10B, 11A, 12A, 13A, 14B

11–14 Excellent **7–10 Great!** **4–6 Could do better** **0–3 Oh no!**

Poster competition

Design a poster to raise awareness about climate change. It could be about the effects of climate change, or actions that can be taken to reduce our impact.

TIPS: Keep your message short and catchy – Keep your writing large and easy to read – Make it bright so everyone can see it!

Name: _____

Address: _____

_____

_____

Age: _____

COMPETITION CLOSES: 30 August 2019

Send your entry to:

POST: Bay of Plenty Regional Council,
Pollution Busters Club,
Freepost 122076,
PO Box 364, Whakatāne 3158

EMAIL: buzzbop@boprc.govt.nz

Natural Hazards
Be prepared!

With the climate changing natural hazards such as floods, storms and landslides could all happen more often in the Bay of Plenty.

Disasters like these can happen at any time and often without warning. Although this sounds a bit scary, if we are prepared for these hazards, we can get through as safely as possible!

Match the natural hazard picture to their Māori and english names

Te Āwhā

Flood

Te Whenua Pāhekeheke

Storm

Te Waipuke

Landslide

ANSWERS: Landslide: Te Whenua Pāhekeheke, Flood: Te Waipuke, Storm: Te Āwhā,

You can learn about the impacts of these events and how to be prepared at: **www.whatstheplanstan.govt.nz**

Information in this newsletter was sourced and adapted from: boprc.govt.nz, mfe.govt.nz, niwa.co.nz, happens.nz, whatstheplanstan.govt.nz

BAY OF PLENTY REGIONAL COUNCIL'S POLLUTION BUSTERS CLUB

Join up or change of address

Are you (or your friends or family) 3-15 years old and live in the Bay of Plenty?

Are you interested in learning about the environment and sustainability?

Join Pollution Busters!

Please have an adult check that the details are correct before you send this.

- ◯ I am a new Pollution Buster
- ◯ I am already a Pollution Buster but my address has changed

Name _____

School _____ Birthday ____/____/____ day / month / year

Address _____

_____