



Issue 67 – July 2016

# Air



## Kia ora Pollution Busters

We hope you had a fun term of learning at school.

This issue is all about AIR! Air is everywhere, and air pollution is everywhere too – from your backyard to business and industry. Air pollution affects everyone somehow, and especially now that the winter weather has set in and we are using our fires.

Bay of Plenty Regional Council work with the community to make sure the region's air is clean and healthy. There are some simple things we can all do to help prevent air pollution. Take a look inside to find out how to take action for our air.

Keep up the good work caring for our environment. 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.

### In this issue:

- What is air?
- Why do we need it?
- Dirty air
- What we can do
- Activities and experiments
- Competition – win a kite!

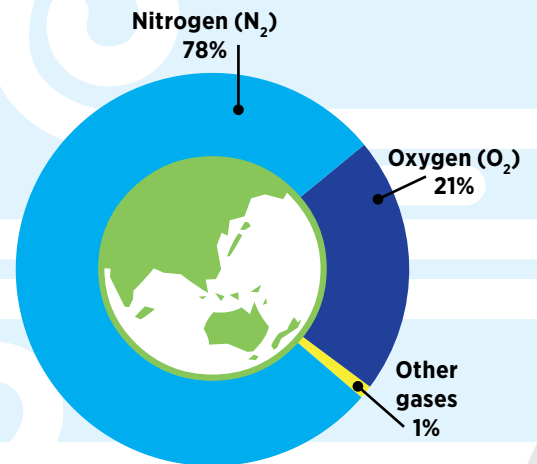
# What is air?

Air is the invisible gases that make up the atmosphere of the earth. It's what we breathe.

## What's air made of?

Air is really a mixture of several gases. A gas is a light, invisible substance that floats freely in the air (like steam for example).

Most of the air is made up of two gases – nitrogen and oxygen. Argon, carbon dioxide and eight other gases make up the rest (only about 1 percent!) of the air.



## Why do we need air?

**Because air gives life to all living things!**

We need to breathe so we get oxygen from the air for our lungs, heart and blood to survive. Plants and animals also need air because they breathe too.

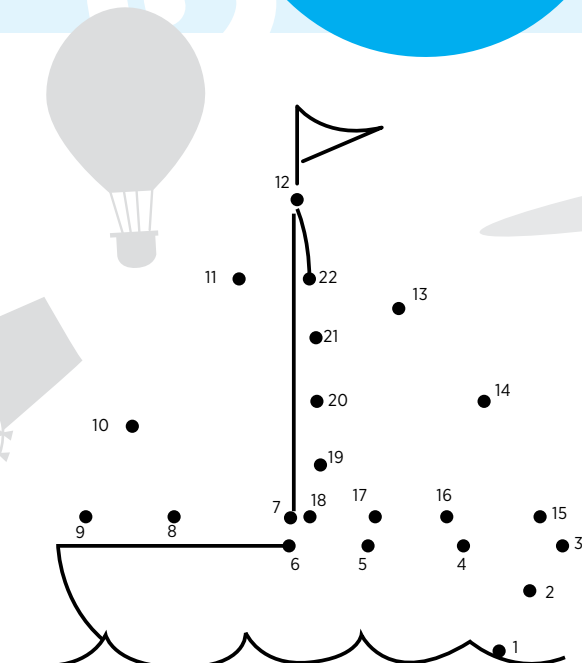
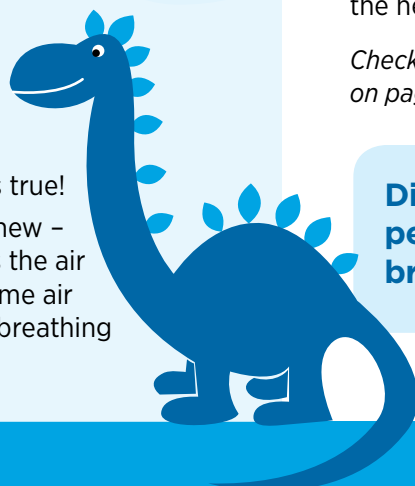
The air can also be used to make electricity and for fun (things like sailing, windsurfing and kite-flying). Can you think of any others?

## Why doesn't all the air get used up?

Because we have magic **Green** air cleaners – plants! green plants use photosynthesis to absorb pollution and clean the air. Learn more about these amazing cleaners on page 9.

## Right now you are breathing dinosaur air!

It sounds strange but it's true! The air we breathe isn't new – it's recycled. That means the air we're breathing is the same air that the dinosaurs were breathing millions of years ago!



*Dot-to-dot: What is this air powered activity?*

## Why is clean air important?

Clean air is important for our health and the health of our environment.

*Check out how 'dirty air' affects our bodies on page 6.*

**Did you know that people take 23,000 breaths every day!**



# Māori and air

Māori legend tells that after the separation of Ranginui and Papatūānuku (the earth mother) their child Tāwhirimātea fled with Ranginui to his new home in the sky. From there Tāwhirimātea controls the weather.

Air is viewed as a taonga (treasure) from Ranginui (the sky father).

Air pollution degrades and lessens the mauri (life-force) of this taonga.

## Draw a picture of Tāwhirimātea – the god of wind

Take a photo of it and email it to [BuzzBOP@boprc.govt.nz](mailto:BuzzBOP@boprc.govt.nz) (or cut it out and post it)

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

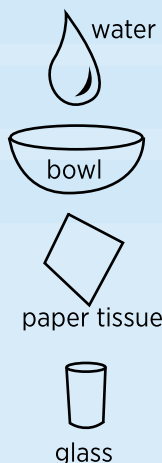
AIR  
ARGON  
BREATHE  
CARBON DIOXIDE  
DUST  
FIRE  
GAS  
HEALTHY  
NITROGEN  
OXYGEN  
PARTICULATES  
PHOTOSYNTHESIS  
POLLUTION  
SMOKE  
SOOT  
SPRAYS  
TAWHIRIMATEA

## ACTIVITY

# Is the air really there?

We can't see air so how do we know it's really there?  
Try this simple experiment to find out...

### You will need:



### What to do

1. Crumple a tissue and push it into the bottom of a glass.
2. Fill a bowl with water.

3. Turn the glass upside down and push it down into the water until it is covered.

4. Pull the glass out again, keeping it upside down.

*The tissue stays dry because there was air in the glass that the water could not push out of the way to reach the tissue.*

# Dirty air

(air pollution)

Air pollution happens everywhere, and is what we say to describe all the bad gases in the air, it is also called 'dirty air' because it is full of **particulates**.

Some pollution you can see like smoke and dust clouds but it's the bits we can't see (particulates) that are a big problem.

Where does the pollution come from and how does the air get dirty?

BuzzBOP has had a brainstorm about this... do you think he is correct? Can you think of any other things that cause air pollution? Add them to Buzz's brainstorm below!



## Particulates

Size does matter!

**The smaller the particles - the more damage they can do.**

Particulate matter (PM<sub>10</sub>) are very small particles, like soot, dust and fumes.

These tiny particles float around in the air and get breathed in - they are bad for us.

We can't stop all the PM<sub>10</sub> particulates getting in the air but there is a healthy level that they should be kept at.

**How small is really small?**

PM<sub>10</sub>: PM stands for particulate matter, while 10 is the measurement across the middle of the speck - see the diagram to see just how small that is!

You could fit 50 PM<sub>10</sub> particles into this full stop.

Human hair  
50 microns

less than  
10 microns each

Finest beach sand  
90 microns

On page 6 you can learn more about where the Bay of Plenty's air pollution comes from.

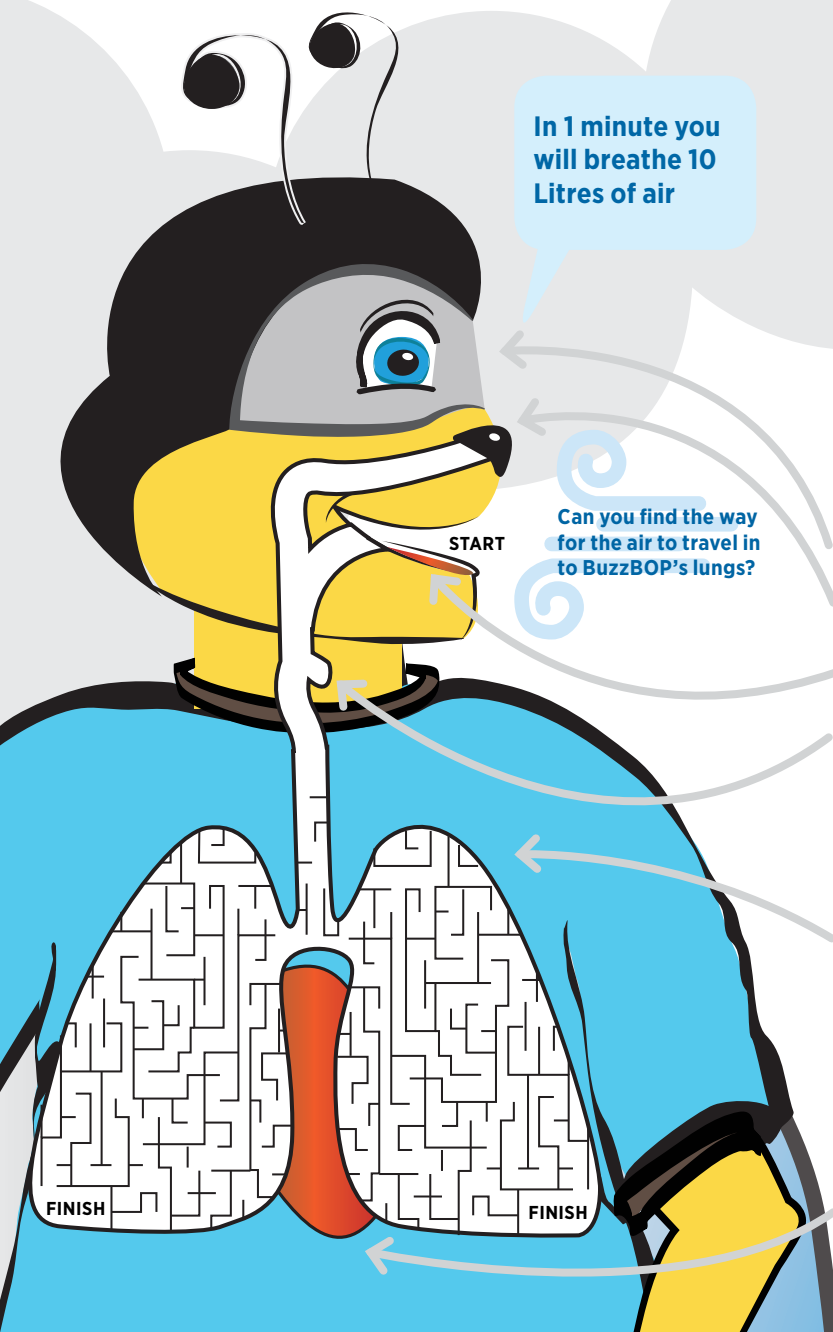
STINK  
ODOUR

DUST

DUST







# How does dirty air affect us?

When air is dirty, it can make it hard to breathe and sometimes it can make you sick.

A health effect might happen straight away like bringing on an asthma attack, or may develop over time such as lung cancer.

**Eyes / karu** Visible pollution irritates the eyes

**Nose / ihu** Irritates the nose and sinuses

**Tongue / arero** Taste the pollution

**Throat / korokoro**

- Larger particles can get stuck in nose and throat
- Can cause chronic cough
- Can cause airway obstructive diseases
- More coughs, colds and chest problems

**Lungs / pukapuka**

- Particles enter the lungs and irritate the air passages and air sacs
- Can cause chest illnesses like bronchitis in children and the elderly
- Can increase asthma attacks – there are more hospital visits for asthma now

**Heart / manawa**

- Existing heart problems can become worse

## Pollution tester

Burning coal to make electricity, petrol to power cars, or gas for heating, all pollutes the air. Even if it doesn't look dirty, it can still hurt us. This activity will give you an idea of how much dirt is made even when a candle burns.

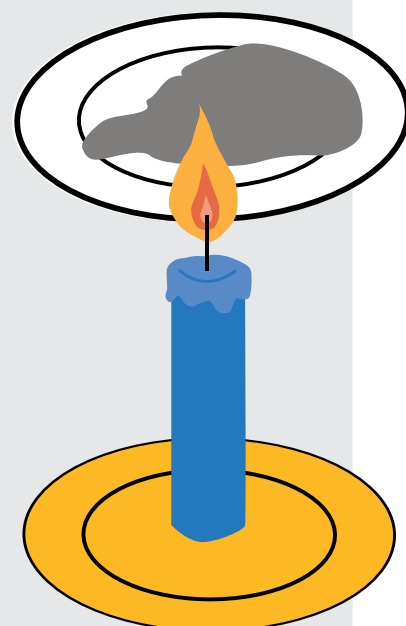
### What you need:

- A candle
- An adult to light it for you (and help you)
- A heat-proof dish

**What to do:** Light a candle and bring a heatproof dish down over the yellow part of the flame for 30 seconds but be careful not to put the flame out. Move the dish from side and side as you do so.

Now look at the underside of your dish. What do you see?

**How it works:** The black sooty stuff is carbon. This comes from the wax when you burn it. Carbon is what goes into the air from things like cars or our home fires. We don't always see it, but our lungs do. That's why we need to be careful about what we're burning.



# Our air in the Bay of Plenty

New Zealand has air quality guidelines that every area has to stay within. These are set so that we can be happy that we (and all other living things) are not going to get sick from breathing polluted air.

Bay of Plenty Regional Council manages the region's air resource to look after it and improve the quality. They work with the community to make sure that the region's air is clean for us and all the children to come.

**Overall the Bay of Plenty's air is good quality, with some problem areas.** We know this because at the Regional Council there are people who:

- monitor and test the air (Environmental Data services, Environmental Scientists)
- check up that people are following the rules and teach better ways to do things that will reduce air pollution (Pollution Prevention Officers)

Most air quality issues are very similar across the region – check out the map. But there are some issues that are more of a problem in some areas than others – like domestic burners (fires) in Rotorua.



Contact the pollution hotline if you have any problems with air pollution - 0800 884 883.



## Rotorua

- Open burning - urban and rural
- Fine particulates (home heating)
- Dust management area - Ngāpuna
- Natural source of hydrogen sulphide from the Rotorua geothermal field

## Western Bay

- Open burning (burning stuff outside like garden waste and rubbish) - urban and rural
- Agrichemical use (in horticultural areas like Katikati and Te Puke)
- Sulphur dioxide from industry in Mount Maunganui
- Dust management areas - Port of Tauranga, Te Puke
- Methyl bromide use at Port of Tauranga (chemical used to get rid of quarantine pests)

## Eastern Bay

- Open burning - urban and rural
- Agrichemical use (in horticultural areas like Whakatāne and Ōpōtiki)
- Natural source of sulphur dioxide from Whakaari (White Island)
- Pulp and paper mills (Whakatāne, Kawerau)
- Geothermal power generation (Kawerau)

## Air quality issues in our region



home heating



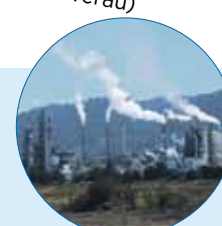
dust



open burning



discharge from industry



agrichemical spraying

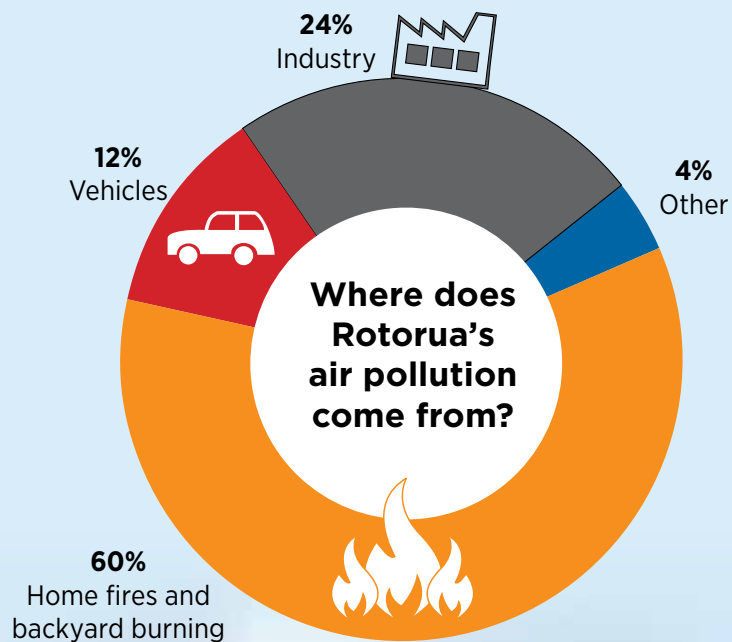
**Can you match the air quality issue to the picture?**

# Rotorua's air

Did you know Rotorua is one of the worst places in New Zealand for air pollution – let's try and change that!

Some people think Rotorua's poor air quality is caused by the sulphur from the natural geothermal features of the area, but it's not.

60 percent of Rotorua's air pollution comes from fires for home heating and open burning.



If you can smell smoke you are breathing smoke

BuzzBOP

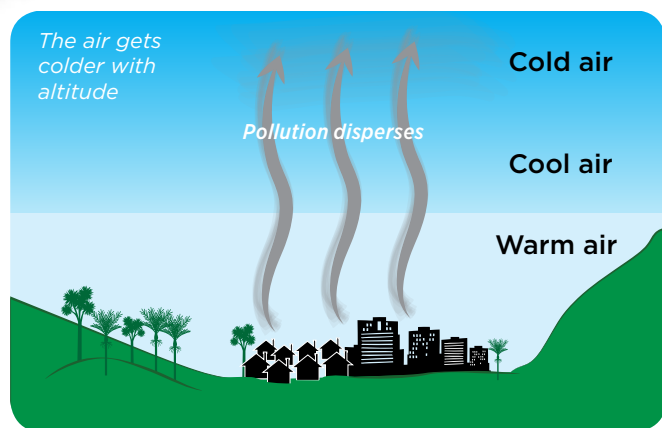
## Top tips to reduce air pollution this winter:

- Insulate – your home and yourself!
- Use clean heating (like heatpumps or low emission burners)
- Burn only clean dry wood

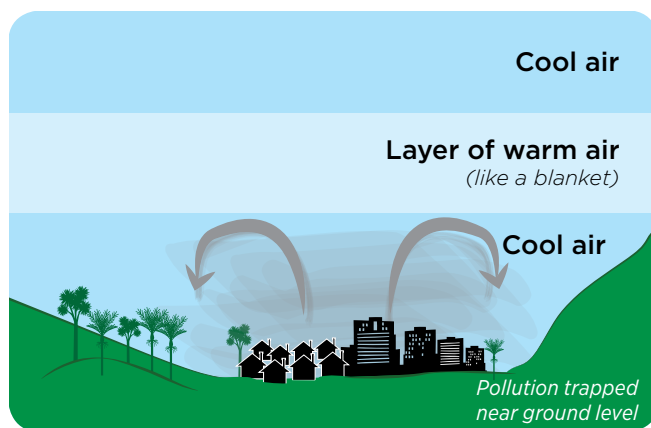
## Why is Rotorua's winter pollution worse?

Look at the photo above – on cold clear days in winter Rotorua city looks like it is covered in fog... but this is not just fog, it's smoke and particulates. It is most noticeable when you look down at the city from above.

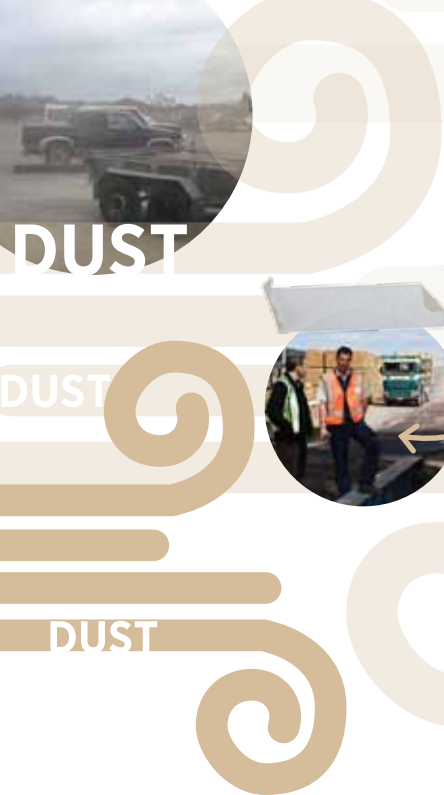
The basin shape of the land around Rotorua means cold air (which normally rises) is trapped by the surrounding mountains. A layer of warm air forms above the cold air acting like a blanket trapping the air pollution (like smoke from home fires) so it stays there – and we breathe it in. Eew! This is called an **inversion layer**.



Normal situation

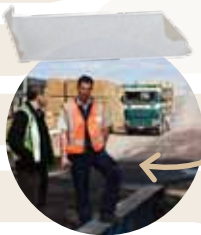


Temperature inversion



# Dirty DUST!

Ngāpuna in Rotorua has a lot of industrial sites and they were DUSTY and causing air pollution! The dust was worse when it was dry and windy and it was annoying to the neighbours (and bad for their health), so something had to be done...



The Regional Council started to make plans with the industries to come up with ways to reduce the dust and stop it in its tracks!

To reduce the problem they have:

- ☒ Dampened down unsealed areas using a water cart.
- ☒ Made vehicles drive slower on unsealed surfaces and roads.
- ☒ Installed sprinklers on driveways.
- ☒ Sealed driveways.
- ☒ Cleaned up any dust that got blown onto roads.
- ☒ Turned unused area into vege gardens to grow kai for the community!



**What else do you think they could do?**

## The plan to reduce the Bay's air pollution!

**Bay of Plenty Regional Council has a plan on how to look after and use the Bay of Plenty's air; and manage air contaminants from human activity in the best way.**

**This year they are updating their 'plan' and have some new ideas:**



No more backyard burning in urban areas (don't worry - you would still be able to have a pizza oven, BBQ and Hangi!)



Regulate types of Burners (fires) - Have people remove or replace their old fires if they aren't 'low emission'

Have to tell people that might be affected by commercial spraying (no need to tell the neighbours you are spraying your driveway weeds though!)

They asked the community what they thought about these ideas and lots of others; and if they need to change anything.

**Write your idea here!**

### What can you do about air pollution?

Lots of things! Like making sure you have a warm, healthy home and thinking about the ways you travel.

Check out some other easy things you can do in the competition on page 11.

You can check out what the community thought at [www.boprc.govt.nz](http://www.boprc.govt.nz)



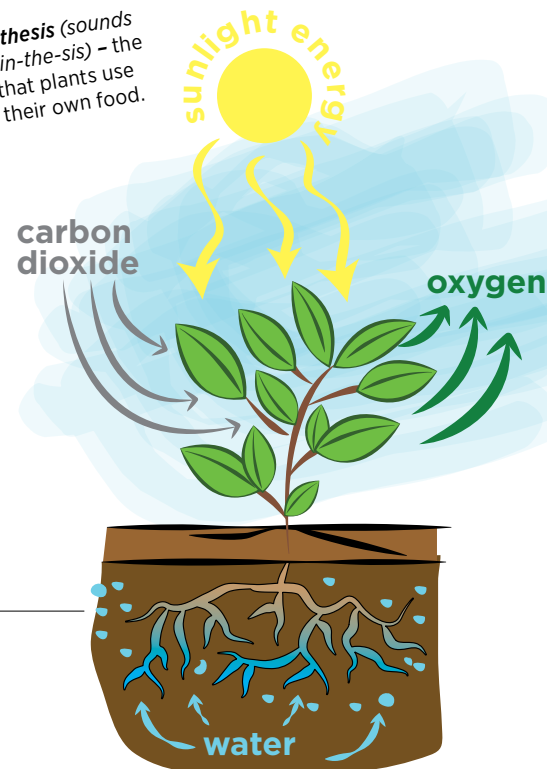


# green air cleaners

# Plants!

Basic photosynthesis

**Photosynthesis** (sounds like fotosin-the-sis) – the process that plants use to make their own food.



Can you fill in the gaps to learn how plants clean the air?

<b>WATER</b>	<b>PLANTS</b>	<b>AIR</b>	<b>ENERGY</b>
<b>FOOD</b>	<b>WASTE</b>	<b>OXYGEN</b>	<b>CARBON DIOXIDE</b>

Plants are essential to life on earth.

They take in the \_\_\_\_\_ from the air.

Carbon dioxide + \_\_\_\_\_ from the sun + \_\_\_\_\_ = plant \_\_\_\_\_

Plants then release \_\_\_\_\_ back into the air as their \_\_\_\_\_!

Clean \_\_\_\_\_ is necessary for life – we need \_\_\_\_\_.

Plant more trees!

## Fun in the air! Make a parachute for BuzzBOP

**A fun and easy way to explore the air!**  
**Let it go from somewhere high and see what happens.**

**You will need:**



**Person** - cut out BuzzBOP below or make your own (a lego person works well!)



**plastic bag**  
(you can also use recycled paper, tissues, napkins or a handkerchief - you just need to tie the string to the four corners)

**blutac**  
(or tape)



**string** (or wool/thread)

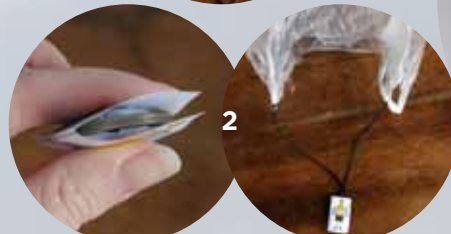
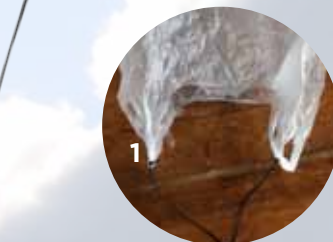
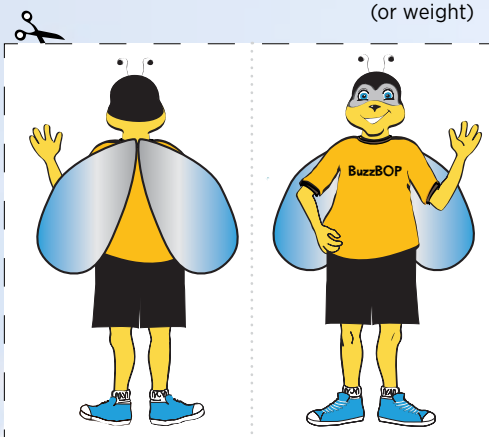


**coin**  
(or weight)



**What to do:**

1. Tie each end of the string to the plastic bag handles.
2. Using bluetac attach the middle of the string and coin inside the folded BuzzBOP.
3. Let it go from a height and see what happens!



# BuzzBOP's MAIL

Thanks for the mail Pollution Busters!

Keep sending us your photos, stories, and art!  
Remember to include your name, age and address  
on the back of your artwork!



Morgan



Nicholas



Mia



Angus



Eden



Georgie

**Congratulations to Mia Longmore – winner of the Hell's Gate Combo Family Pass**



## WIN

**Win a kite** so you can have  
some fun in the air!  
Enter the competition (opposite).  
Send your entries before 19 August 2016.



**BAY OF PLENTY  
REGIONAL COUNCIL  
TOI MOANA**

**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](mailto:buzzbop@boprc.govt.nz)



# Prevent air pollution!

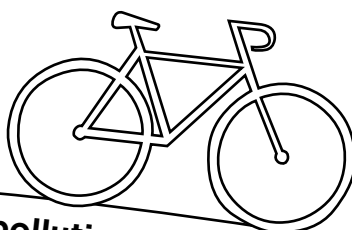
**Make the world a better place to live.**

**There are lots of ways for you to reduce air pollution!**

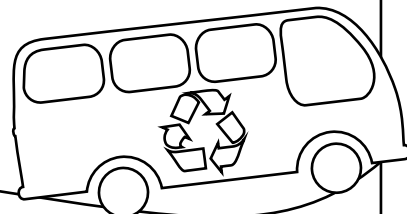
## GREEN Transport



**Walk** - Better for us and the air!



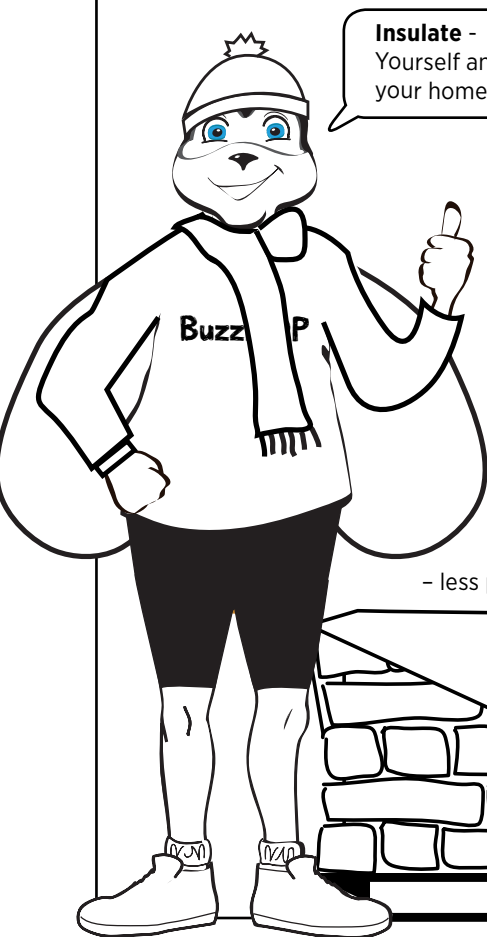
**Ride a bike** - It is also better for our bodies. Plus it's fun!



**Take a bus or carpool** - lots of people can travel together so that means less cars on the roads!

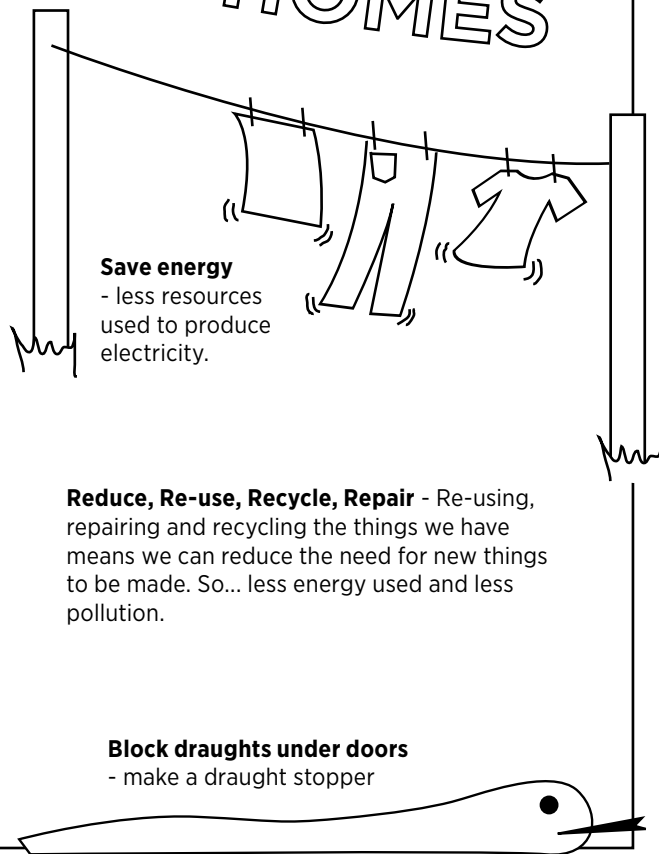
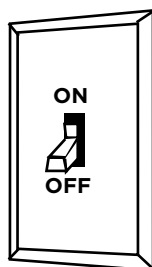
**Less vehicles on the road = less air pollution**

## HEALTHY HOMES



**Insulate** - Yourself and your home!

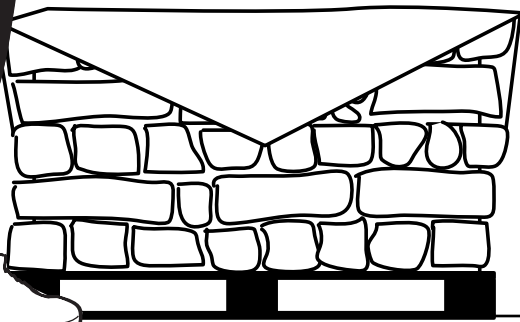
**PLANT TREES!**



**Save energy**

- less resources used to produce electricity.

**Stack your wood good!**  
**Burn only clean dry wood**  
- less pollution into the atmosphere.



**Reduce, Re-use, Recycle, Repair** - Re-using, repairing and recycling the things we have means we can reduce the need for new things to be made. So... less energy used and less pollution.

**Block draughts under doors**  
- make a draught stopper

### COLOURING IN COMPETITION

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Age: \_\_\_\_\_

Competition age groups are 3-6, 7-10 and 11-14. **Entries close 19 August 2016**

#### Post entries to:

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

#### Or email to:

buzzbop@boprc.govt.nz



# BuzzBOP's Friend

## Sherryn Owen

Bay of Plenty Regional Council Pollution Prevention  
Officer for the Rotorua Air Quality Control Bylaw 2010

### What do you do in your job?

Part of my job is making sure the three Rules for Rotorua's Airshed are followed. I have to make sure no-one uses an indoor open fire, that any non-complaint burners (ones that don't fit within the rules) are removed from a house when it is sold, and that only approved burners are installed in houses.

I also respond to complaints about smoky or smelly fires and make sure that all the industries in Ngāpuna follow their plans to manage dust.

### What is the best part of your job?

The best part is advising and helping people on ways to improve what they are doing so they reduce air pollution. I enjoy getting them on board with what we do at the Regional Council and they then become part of our wider team making sure we are all breathing clean air.

### What is your top tip to reduce air pollution?

DO NOT BURN HOUSEHOLD RUBBISH!

### What is your message to pollution busters?

Keep an eye on what your families and neighbours are burning. Only dry, untreated wood should be burnt in an indoor fire and dried green waste in an outdoor fire. Encourage people you know to recycle as much as they can and use the landfill or rubbish collections for everything else! ☺



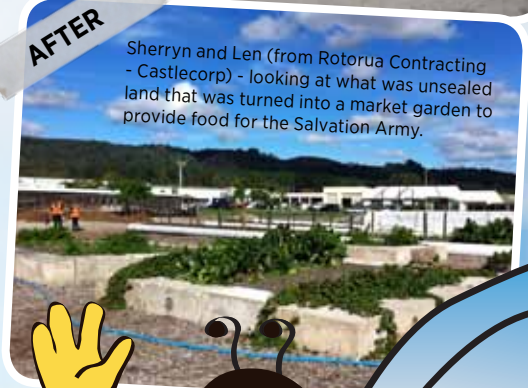
Sherryn at a finger joining warehouse where she was working on a Dust plan.

ROTORUA CONTRACTING  
- CASTLECORP  
**BEFORE**



**AFTER**

Sherryn and Len (from Rotorua Contracting - Castlecorp) - looking at what was unsealed land that was turned into a market garden to provide food for the Salvation Army.



## JOIN POLLUTION BUSTERS!

Do you have friends or family  
aged 3-15 years old and live in the  
Bay of Plenty?

Are they interested in learning  
about the environment and  
sustainability?

Get them to join the Pollution Busters Club  
by sending BuzzBOP the following:

Name, address, phone number, birthday and  
school.

Post to:

BuzzBOP and Team  
Bay of Plenty Regional Council  
Freepost 122076  
PO Box 364  
Whakatāne 3158

Email:  
buzzbop@boprc.govt.nz

Information for this  
newsletter was sourced  
and adapted from:

Previous Pollution Busters  
Newsletters – Bay of Plenty  
Regional Council  
[www.boprc.govt.nz](http://www.boprc.govt.nz)

Clearing the Air Education  
Resource – Hawke's Bay  
Regional Council  
[www.hbrc.govt.nz](http://www.hbrc.govt.nz)

Waikato Regional Council  
[www.waikato.govt.nz](http://www.waikato.govt.nz)

Ministry for the Environment  
[www.mfe.govt.nz](http://www.mfe.govt.nz)