Environment Bay of Plenty's

POLLUTION busters CLUB

Environment Bay of Plenty
REGIONAL COUNCIL

Air

Kia ora Pollution Busters!

Newsletter Issue 38, March 2009

A HUGE hello to you all from BeeBOP and the Pollution Busters Team! We hope you had a fantastic term at school and had heaps of fun learning new stuff. BeeBOP thinks that you're doing an awesome job caring for our environment and says you should keep up the great work! While you're enjoying yourself these holidays try to do some extra things to help the environment. It could be something simple like walking or biking to your friend's house if they're close by, putting on a sweatshirt instead of turning on the heater, or making sure your firewood stack is kept nice and dry. Every little thing you do makes a difference to our environment.

In this issue we are going to be looking at the air we breathe – What's it made up of? What makes air bad for us? What can we do to help make our air better? So come on a journey with us as we learn about air and the environment.

Thanks to all of you who entered the colouring-in competition in our last issue. It was awesome to see so many fantastic colours and recycled materials being used! Check out page 11 for the winners – Well done!

For the competition in this issue BeeBOP would like you to complete the wordfind about the air we breathe. The details are on page 10. Remember, you've got to be in it to win it.

Have a great holiday and keep up your fantastic pollution busting!

Kia u, kia ngakaunui ki
nga mahi pai.
Be steadfast and conscientious in all the good work.

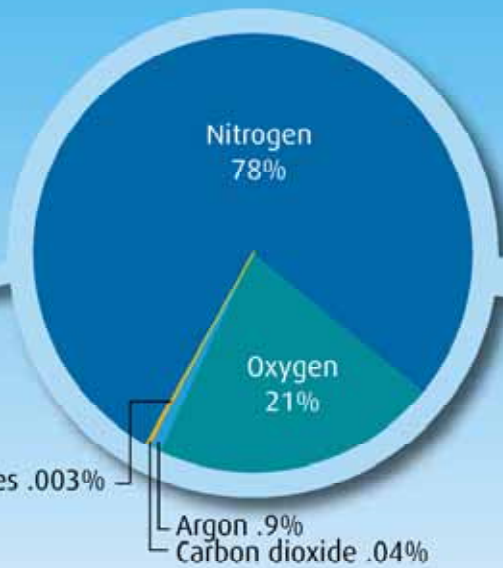
From your friends BeeBOP and the team

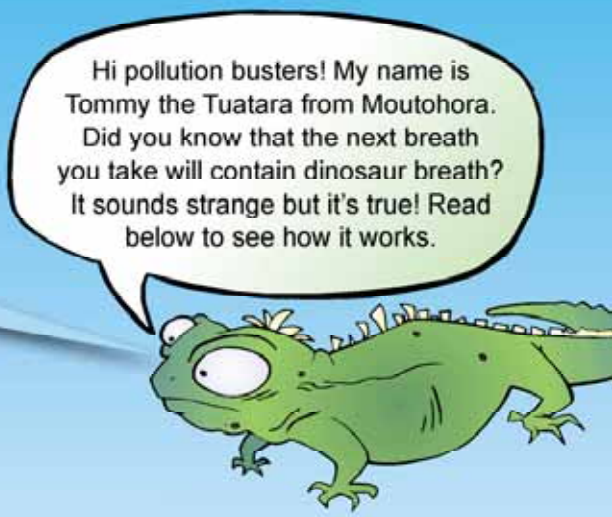
Address: Freepost Environment Bay of Plenty, PO Box 364, Whakatane 3158. Email: BeeBOP@envbop.govt.nz

Why do we need air?

Did you know that humans take 23,000 breaths every day? We need to breathe in order to get oxygen from the air for our lungs, heart and blood to survive. When air is dirty, it can make it hard to breathe and sometimes, it can make you sick! Plants and animals also need air because they breathe too.

What's in the air?





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! Air is really a mixture of several gases. A gas is a light, invisible substance that floats freely in the air - steam, for example. Two of these gases, nitrogen and oxygen, make up almost all of the air. Air is mostly nitrogen and oxygen. Argon, carbon dioxide and eight other gases make up only about 1 percent of the air.

Is 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:

- bowl
- water
- glass
- paper tissue

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 our again, keeping it upside down. The tissue remains dry because there was air in the glass that the water could not push out of the way to reach the tissue.

How does the air get dirty?

Dirty air comes from pollution. Pollution comes from human-made sources like cars, trucks, smokestacks and factories. Some pollution comes from natural sources like bush fires, dust and when a volcano erupts!

What else does air pollution do?

Humans can get sick from air pollution, but we are not the only ones! Animals like birds, butterflies and even fish can be affected by air pollution. Dirty air can make it hard for plants to grow. Buildings and statues may start to wear away too!

Our air in the Bay of Plenty

Did you know? Rotorua is now 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 backyard burning.

Have you got a wood burning fireplace?

You can help make a big difference to our air just by checking your woodpile.

Did you know? Dry, clean wood produces the most amount of heat and the least amount of pollution.

How about helping Mum or Dad with the wood these holidays? Here's a checklist you can go through with them:

- ☐ Is the wood clean? (treated wood, drift wood and painted wood are all bad for our air)
- ☐ Is the wood dry?
- ☐ Is the wood stacked loosely off the ground?
- ☐ Is the wood covered and out of the rain?

If you ticked all those boxes then you've just made a difference to our environment. Good work!

Wear an extra layer of clothes rather than lighting the fire.

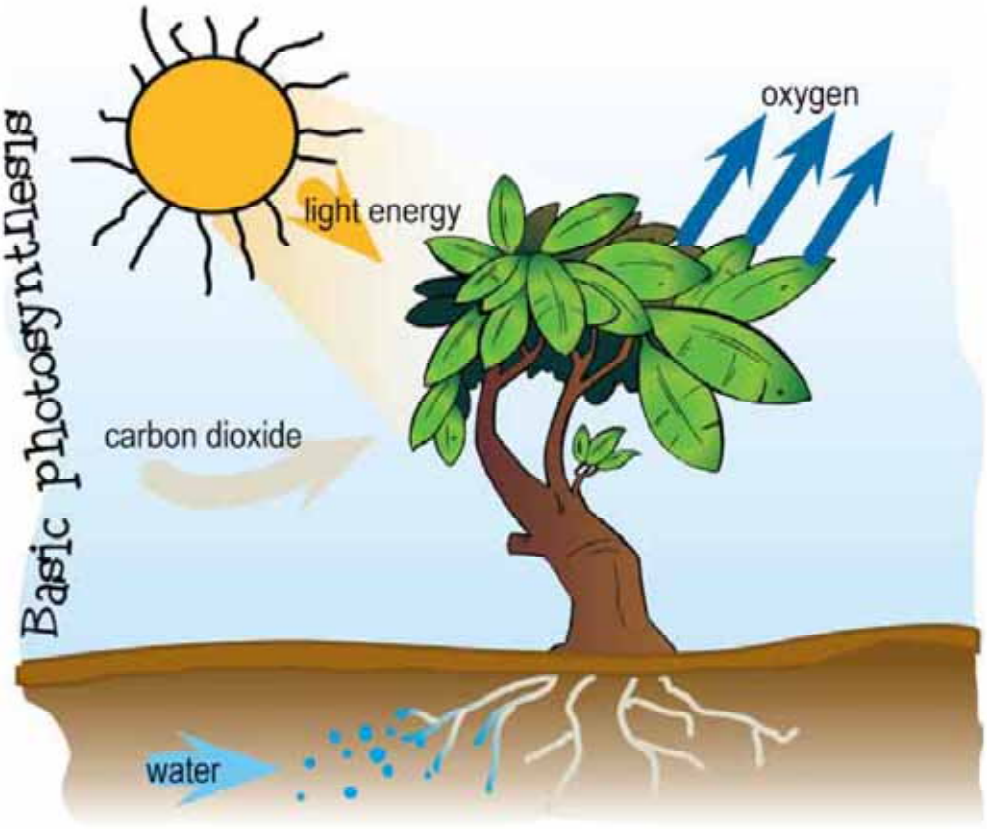
How does the air get clean?

Did you know that plants breathe too? Green plants use a process called photosynthesis (sounds like foto-sin-the-sis) to turn carbon dioxide, and other gases that are bad for us, into oxygen that we need. By taking these gases out, plants like trees and bushes help clean the air. The gases that are bad for us don't hurt the plants – the plants need them to make our oxygen. That's one reason why it's so important to grow and protect these types of plants. But they need our help in keeping the air clean!

Why is clean air so important?

You need to breathe to stay alive. But how clean is the air you breathe? If you breathe dirty air, you are more likely to develop health problems and become ill. Plants and animals need clean air too. A lot of the things that make our lives more comfortable like cars, electricity and heating, create bad gases which make the air dirty.

'Air pollution' is what we say to describe all bad gases in the air that we breathe and that are dangerous for us. But don't worry! Not all gases are bad!



Have you ever...

- ❑ **Ridden your bike?** Cars and trucks make pollution, but bikes, skateboards and rollerblades don't. You help the air every time you use these things instead of riding in the car!
- ❑ **Taken the school bus?** Some trips are so long that you need to use a car or truck to get where you are going. When people ride buses, there are fewer cars and trucks on the road!
- ❑ **Caught a ride with someone?** This is called carpooling and it puts fewer cars on the road too!

If you answered yes to any of these, you've helped the environment!

How can we keep our air clean and healthy?

bicycle!

reduce, reuse recycle!

ride the bus!

burn only clean dry wood in your fireplace!

drive less!

save energy!

walk!

Colouring page adapted from "Is air there" Spokane County Air Pollution Control Authority

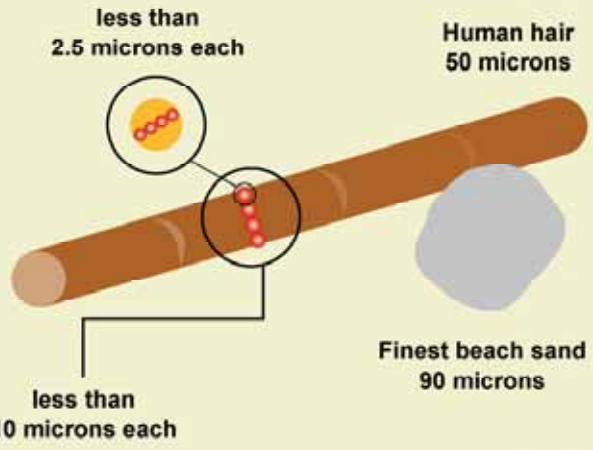
What are the bad gases?

- **Carbon monoxide** is a gas that pollutes the air, and is mainly released by cars and other vehicles. It has no colour or smell.
- **Nitrogen oxides** are emitted from vehicles, like cars and trucks. During rush hour periods, a lot more is released in the air. Nitrogen oxides are also emitted from power stations. These gases also make acid rain.
- **Hydrocarbons** are produced when petrol is not fully burnt. They are one of the causes of modern-day smog.
- **Particulates** are very small particles, like soot, dust and fumes that are released in the air. They are caused by vehicles, factories and smoke from homes burning fossil fuels for heating.
- **Sulphur dioxide** has no colour. Most of it is released by power stations. It causes acid rain when mixing with water in the air.

Particulate matter

Have you ever noticed a sunbeam with lots of little specks of dust floating in it? This is the small 'bits' or specks of solid matter that float in the air. The smaller these particles are the more they are a problem.

PM_{10}: 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! $PM_{2.5}$ is even smaller.



These small particles are breathed in and very easily travel down into our lungs causing health problems for a lot of people e.g. asthma.

Make an easy pollution tester

A lot of the particles that pollute our air come from the burning of fossil fuels and the fumes from our cars. Even if it doesn't look dirty, it can still hurt us. This activity will give you an idea of how much dirt can come from burning things.

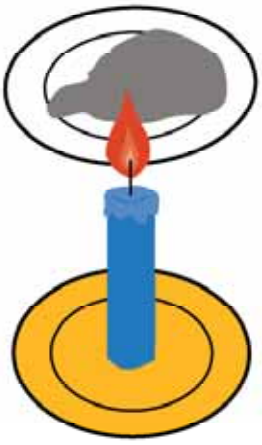
What you need:

- A candle
- An adult to light it for you
- A heat-proof dish (like a cake tin)

Light a candle and bring a heat-proof 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 cars, factories and our home fires. We usually don't see it, but our lungs do. That's why we need to be careful about what we're burning.



Oxygen leaves

You need:

- 1 clear, wide-mouth jar
- Water
- 1 large green leaf
- Magnifying glass

Fill the jar with water and drop the leaf into it. Put the jar in a sunny place like outside or on a sunny windowsill. After an hour go back and check it – if the outside of the jar is warm you're ready for the good bit! Grab your magnifying glass and take a look at what's happening inside the jar… what do you see?

What you should see is thousands of tiny bubbles on the leaf and all around the inside of the jar. Woah! Where did they come from?

The bubbles are oxygen gas which has come out of the leaf. Plants are pretty special because, with the help of certain elements and sunlight, they make their own food. But just like us they have waste products leftover from their food. Plants release oxygen bubbles as their waste product which then makes up a part of our atmosphere. Normally we can't see this but because the leaf is in water we can see the oxygen it has let off as bubbles.

Be an air quality scientist

How clean is the air around you?
Try this easy experiment to find out!

You will need:

- White cardboard
- Scissors
- String
- Vaseline

Cut your cardboard into rectangles of approximate 7cm x 9cm and tie a piece of string to each piece. It's best to have at least 3 cards to compare the results.

Now have a think about where you would like to put the cards. Different locations will get different results. What about: next to an open window, outside from a tree, near a busy road, up high or down low.

When you know where each card will go write the location, starting date and time on each of the cards. Then smear Vaseline over each card and hang in the chosen location.

After a week return to collect the cards being very careful not to touch the Vaseline! When comparing the cards what can you see? Is one card dirtier than the others? Think about why this could be. Where did the particles come from? Do you think the weather or time of year made a difference?

Take action for air

There are lots of ways that you can take action to help clear the air. Here are a few suggestions…

Planting trees

Trees are big 'air cleaning machines' so the more you have the better it is for air quality. Keep an eye out for groups in your community that you can get involved with.

Composting and worm farming

Rotting food and waste releases methane gas which is really bad for the environment. By composting you are not only reducing the levels of methane being released but also creating great fertiliser for your garden.

Re-using/recycling paper

Use both sides of the paper and try to buy recycled paper. This helps as less trees will need to be cut down and less energy used to make new paper.

Walk, bike or carpool

Does your school have a walking school bus? If so use it! Car emissions are among the worse things for air quality. If you can use other ways: carpool, bus, train, bike or your feet – you will be doing the air a world of good.

Conserve energy

A lot of the energy we used is produced by using fossil fuels which increases the pollution in our air. Even taking small steps can make a big difference. Turning off lights and appliances when not in use, using energy efficient lightbulbs and wearing more clothes before turning on the heater are all changes that are easy to make.

Fun in the air!

We need air to breathe and for plants to grow – but we can also have fun in the air! Have you ever flown a kite? Kites have been around for a long time and have been used for all sorts – from fun to fishing to sending messages!

Māori kites - Manu Tukutuku

Māori kites are known as manu tukutuku, manu aute, or pākau. The word manu means both kite and bird. They were flown for fun, to communicate with people far away, to predict success in battle, or to find an enemy. Kites are an important part of Matariki (Māori New Year) celebrations.

What were they made of?

Kite frames were usually made from the wood of trees or shrubs such as mānuka (tea tree). Children's kites were smaller and made from stems of bracken or rush. The coverings were made from bark cloth from the aute (paper mulberry) plant. Kites were decorated with feathers, shells, carved faces and coloured patterns.

Types of Māori kite

There were about 17 types of Māori kite. Today, only seven original kites survive, and they are in museums.

Many kites were shaped like birds. Some were made to resemble kākā (brown parrots), while others looked like totoriwai (robins).

Birdman kites looked like humans with extended wings. They had masks decorated with teeth, tattoos, and hair made of hawk feathers.

There were kites in other shapes too – some looked like flounder, others were T-shaped, rectangular, or triangular.

Parachute people

A fun and easy way to explore the air! Take these to the top of somewhere high and see what happens.

YOU WILL NEED

- 20 x 20 cm square of lightweight cloth (you can also use recycled paper, tissues, napkins or a handkerchief)
- thread
- bluetac or something to make a person!

WHAT TO DO:

1. Tie the thread to the four corners of the cloth by scrunching up each corner, wrapping one end of the thread around it a few times and tying a knot. Leave the other end of the string free.
2. Attach the other three strings. Gather the string ends together and tie them into a knot.
3. Attach the string to your person.
4. Let it go from a height and see what happens!

Making a Manu Tukutuku

Lets make a 'manu tukutuku' to fly in the wind.
You will need

- pieces of light wood, manuka branch, raupo stalk, korari (flax flower) stalk, toetoe or rarauhe
- raupo leaves
- harakeke – stripped into string
- a long cord
- feathers
- toetoe flowers

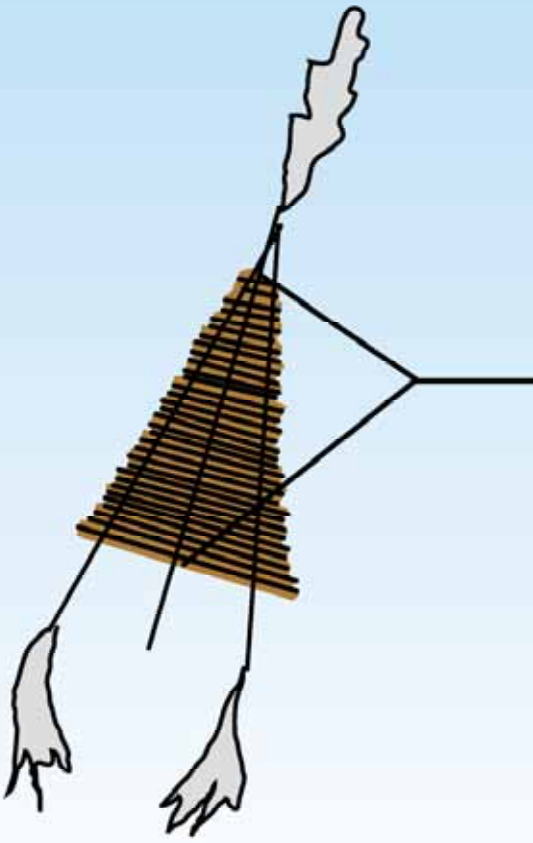
CONSTRUCTION

Look at the pictures (right) to guide you.

1 Place four pieces of raupo stalk. or whatever you have chosen to use, like this, to make a frame for your manu tukutuku.

2 Lie the raupo leaves carefully over the frame, trimming and cutting the leaves to follow the shape of your frame and to ensure that you have enough leaves to cover the frame.

3 Tie each piece of raupo leaf to your frame using the harakeke. Tie some toetoe flowers and feathers to the frame as shown in the picture, to make a tail for your manu tukutuku. Attach the long cord securely to your frame.



FLYING YOUR MANU TUKUTUKU

Here is a waiata to sing to encourage your manu tukutuku to fly.

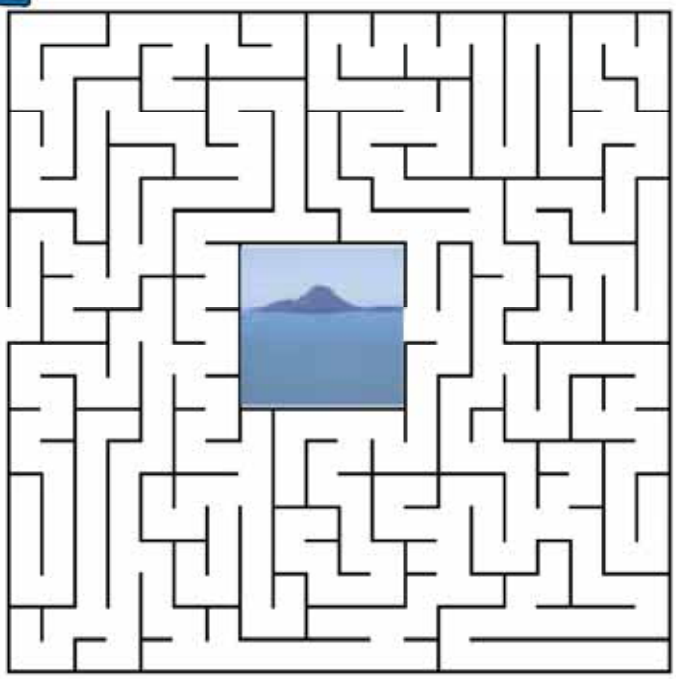
E rere e rere, taku manu e
Piki mai, piki mai
Ki te rangi e
Ki te taha o te hau .....nui
Hei kawe taku mihi
ki a Tawhiri e

Fly away, fly away, my kite
Rise up, rise up
to the sky
to the side of the big winds
take my greetings
to Tawhiri

Adapted from: 2001 Enviroschools Kit page 321

MAZE

Help Tommy the Tuatara get home to Moutohora



Use safe household cleaners that put less dangerous chemicals into the air. *You can get a copy of this helpful brochure by contacting BeeBOP.*

Competition!

cut here

Can you find the words?

AIR
BIKE
BREATHE
BUS
CAR
CARBON
CLEAN
DRY
ELECTRICITY
ENERGY
FIREWOOD
HEATING
KITE
MANU
OXYGEN
PARTICULATE
POLLUTION
RUBBISH
SMOKE
WIND

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

Entry form for wordfind /questions
(Competition closes 8 May 2009)

Name: _____

Address: _____

Age: _____

Send your answers to

Pollution Busters Mail

Competition Winners

Congratulations to the winners from our last newsletters colouring competition!

Top to bottom:
Angelina Green - Age 4
Shannon Thompson - Age 11
Michael Savage - Age 16

BeeBOP would love to hear from you!

Send your pictures and poems and letters to BeeBOP at this address:

Pollution Busters Club
Environment Bay of Plenty
Freepost Environment Bay of Plenty
P O Box 364
Whakatane 3158

BeeBop's Friend

Shane Iremonger

What do you do?

I am an environmental scientist and I work mostly on air quality and coastal dynamics.

How did you become an environmental scientist?

I trained at Waikato University for 5 years and then gained some practical experience by working in an environmental data collection team.

What's the best part of your job?

It's always changing! One day I'm on my computer, the next I am outside taking measurements on the beach.

What's your message to the Pollution Busters?

It's important that you think about clean and efficient ways of keeping warm at home during winter. If you live in a home with a woodburner then you shouldn't burn any household rubbish in it. You should also make sure that your firewood is dry so you get more heat and less pollution when it burns. If your family uses a portable gas heater then you should make sure there is good air circulation through the room.

Pollution Busters join up or change of address here...

Please have an adult check that the details are correct before this is sent.

☐ I am a new Pollution Buster

☐ I am already a Pollution Buster but I have changed my address

Name _____

School _____ Birthday ___/___/___ day / month / year

Address _____

_____ (Postcode) _____

Alex and BeeBOP

Freepost Environment
Bay of Plenty
PO Box 364
Whakatane 3158

Write your name, age and address on your letters and on the back of your artwork.

Have you moved and changed address?

If you have moved and changed address, please write to us so we can make sure you get your newsletter.