

POLLUTION BUSTERS CLUB

Dirty Air

Kia ora Pollution Busters!

Issue 42 – April 2010

Welcome to the first issue of 2010! BuzzBOP hopes you had a fantastic and safe summer break. With the weather getting colder now we start thinking of steaming cups of milo, woolly socks and nice hot fires. But along with the cold, winter brings some environmental concerns that we should be thinking about.

Did you know that Rotorua has some of the worst winter air pollution in the country? This is something we have to change. Luckily there are some simple things we can do to help prevent air pollution. Take a look inside to find out how to make sure you have a warm, healthy home.

You'll also find the winners to our Cool Coastlines competition in this issue. A

special mention must go to Bailey and Kane Johnson and Amos Christophers for their fantastic entries into the milkbox treasure chest competition we also ran. Congratulations! Soon you'll be getting your signed copies of Nikki Slade Robinson's 'That's Not Junk' book.

Keep an eye on your letterboxes in the coming weeks for your invite to this year's Pollution Busters parties! Come join BuzzBOP for his first party and participate in some of the awesome activities we have lined up.

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

**From your friends
BuzzBOP and the whole Pollution
Busters team**

Air Pollution

What is pollution?

Air pollution is dirty air. It can be caused by things like smoke from fires, factories, car exhausts and even natural sources like dust, bushfires and pollen. All of this makes our air dirty, unhealthy and ugly!

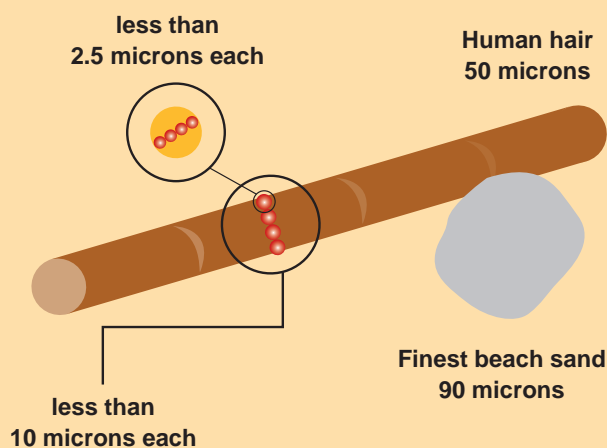
What do we mean by dirty air?

Some pollution you can see – like smoke and dust clouds – but it's the bits that we can't see that are the problem. Particulate matter (PM_{10}) is the really, really small specks of dust, coal and burnt wood in the air. These tiny particles float around in the air and can harm our health as well as the health of all the other plants and animals in the area.

We can't stop all the PM_{10} particulates getting in the air but there is a healthy level that they should be kept at. Unfortunately during the winter these levels rise due to things like more fires. Rotorua has the worst air quality in the North Island and the fourth worst in the country – that's a shocking statistic and not something the Bay of Plenty wants to be known for! Let's change that. Read on to find out what you can do...

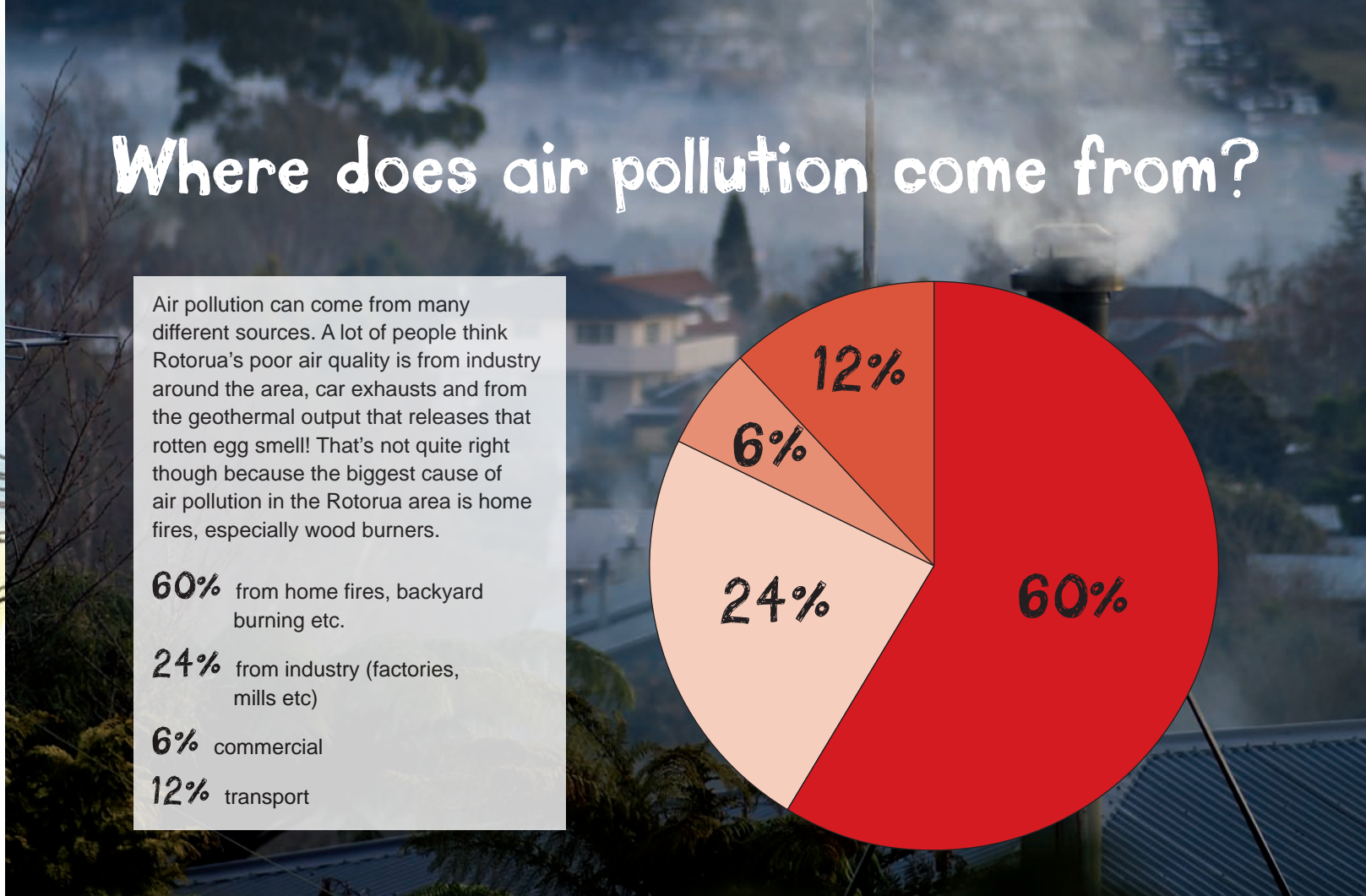
How small is really small?

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.



You could fit 50 PM_{10} particles into this full stop. ←





Where does air pollution come from?

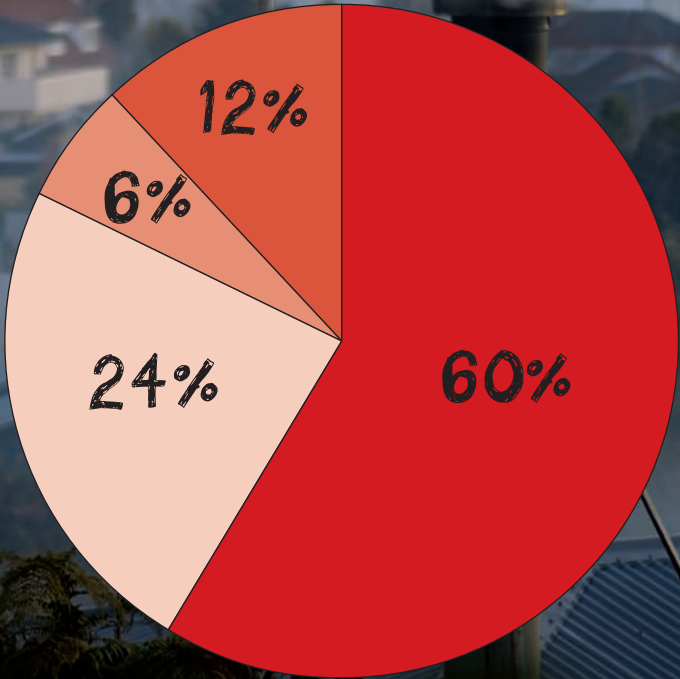
Air pollution can come from many different sources. A lot of people think Rotorua's poor air quality is from industry around the area, car exhausts and from the geothermal output that releases that rotten egg smell! That's not quite right though because the biggest cause of air pollution in the Rotorua area is home fires, especially wood burners.

60% from home fires, backyard burning etc.

24% from industry (factories, mills etc)

6% commercial

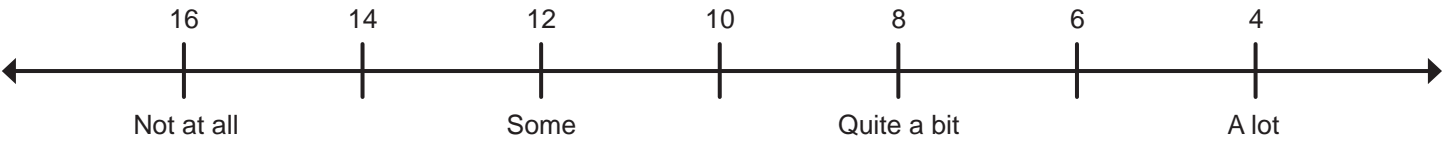
12% transport



How much pollution does your home produce?

Add up your scores from the table below to find out how your home measures on the pollution scale.

| Main method of heating | | How often fire is used (in winter) | | Fuel used | | Insulation (ceiling, floor, windows) | |
|---------------------------------|---|---|---|---|---|--------------------------------------|---|
| Heat pump, electric/gas heaters | 4 | Never have a fire | 4 | Gas/electricity only | 4 | House totally insulated | 4 |
| Modern woodburner | 3 | Occasionally have a fire (e.g. when it's windy) | 3 | Dry, unpainted wood only | 3 | House mostly insulated | 3 |
| Woodburner 5–15 years old | 2 | Have a fire about half the nights in winter | 2 | Wood is usually dry, and not painted | 2 | House has some insulation | 2 |
| Open fireplace | 1 | Have a fire most winter nights | 1 | Sometimes use coal, or wet wood, painted wood or drift wood | 1 | House has little or no insulation | 1 |



Clean the air! What can you do to help?

| What my family can do | ✓ | What I can do | ✓ |
|--|---|--|---|
| Insulation | | | |
| Block out draughts around doors and windows with door snakes or draught stopping tape | | Make a door snake (see instructions overleaf) | |
| Install or upgrade ceiling insulation | | Shut doors to rooms that aren't being used. | |
| Buy good thick curtains for all windows | | Close all the curtains when it starts to get dark to keep the heat trapped inside. | |
| Block out draughts around doors and windows with door snakes or draught stopping tape | | Insulate yourself first by putting on an extra layer of clothing instead of lighting the fire. | |
| Cleaner burning | | | |
| Only use dry firewood. Don't burn treated or painted timber or driftwood | | Help stack firewood correctly | |
| Store firewood correctly (see more on pg 5) | | Bring wood in to dry before burning | |
| When adding wood to the fire don't overfill - leave plenty of room for air to circulate. | | Help with sorting the recycling. Why not make a separate bin inside for unwanted paper? | |
| Hire a chimney sweep to clean the flue out for more effective burning. | | If you are helping with the fire only use small pieces of kindling until the fire is burning well. | |
| Don't burn household rubbish – plastics and paper are all better to be recycled. | | | |
| Burn smaller logs - no more than 15cm | | | |

From Environment Canterbury's Clear the Air resource

For more tips check out <http://www.energywise.govt.nz/>



I wood, wood you?

If you and your family are going to be using a wood burner this winter one of the most important things you can do is make sure your wood is dry and stored correctly. This will not only help prevent air pollution but will also mean your fire will burn better and keep you warm for cheaper!

Storing your wood correctly

Follow these 4 easy steps for the perfect wood pile!

1. Choose a sheltered location with good airflow

Under your deck or under the eaves of your house are ideal places to keep your wood pile. The key is to choose somewhere sheltered from the rain and with good airflow.

2. Keep your wood off the ground

Moisture from the ground can make your wood wet which makes it burn less effectively. An old wood pallet is ideal for keeping wood off the ground. Maybe you can find one at The Waste Exchange... <http://bop.nothrow.co.nz/>

3. Stack your wood in a criss-cross pattern

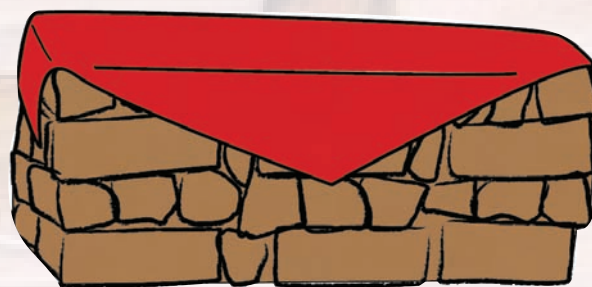
When stacking it is best to do a criss-cross pattern (see pictures) as this will help air circulate through the wood. When there are air gaps, the wood dries quicker.

4. Cover your wood

The final step to creating a good wood pile is to cover the top of your stack with a tarpaulin. If you can cover all the sides that's even better! But a cover for the top is essential.

Can you spot the correct wood pile?

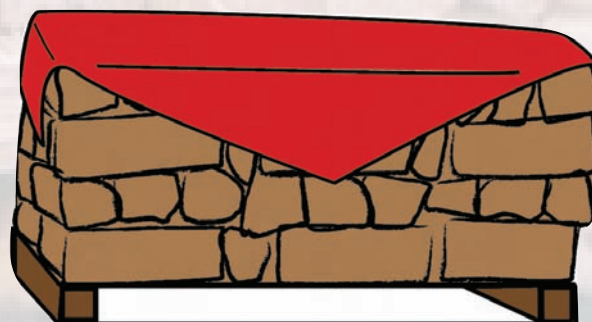
Take a close look at these wood piles... one of them is the perfect way to stack your wood this winter. Which is it? Do you know why? You can find the answer on pg 11.



A



B



C

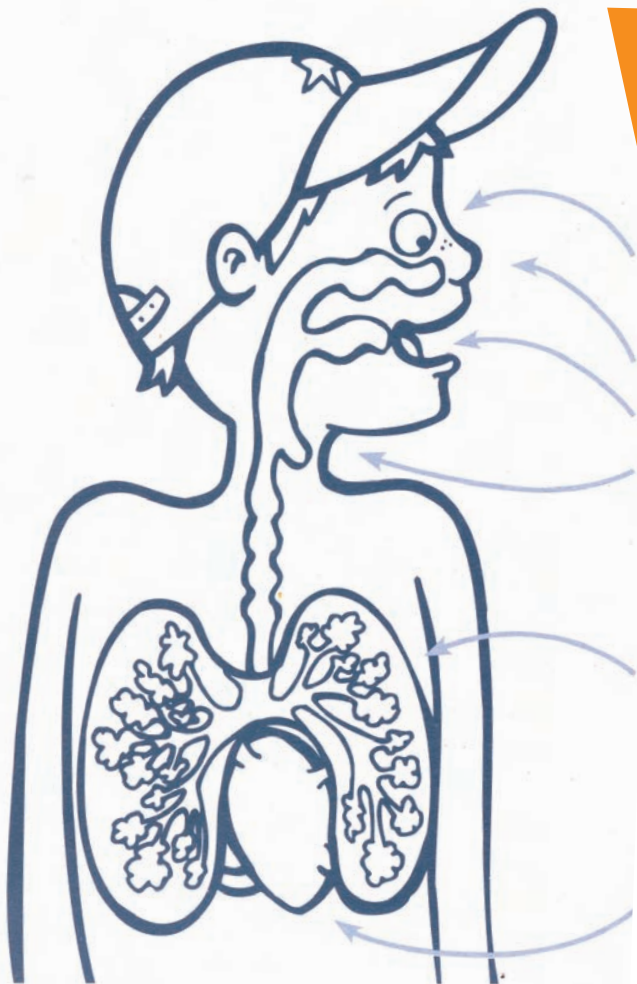


Good wood checklist

Make sure you can tick all of this list to ensure safe and efficient burning.

- ☐ Collect your wood in summer so it has plenty of time to dry out.
- ☐ Never burn green or treated wood (old fenceposts are a no no).
- ☐ At the start of the season make sure you have plenty of wood – double what you think you will need. That way the wood is dry when you need it. And if you don't use it you can always use it the following year.
- ☐ Start your fire off with small bits of kindling and only add big bits when the fire is burning properly.
- ☐ Stack the wood loosely in your fireplace to keep lots of room for air to circulate.

Dirty air is bad for you!



Eyes

Visible pollution
Irritates the eyes

Nose

Irritates the nose and sinuses

Tongue

Taste the pollution

Throat

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

Lungs

Particles enter the lungs and irritate the air passages and air sacs
Can cause chest illnesses in children such as bronchitis
Can increase asthma attacks – has increased hospital visits for asthma

Heart

Existing heart problems can become worse

From Environment Canterbury's Clearing the Air resource

Make a draught stopper

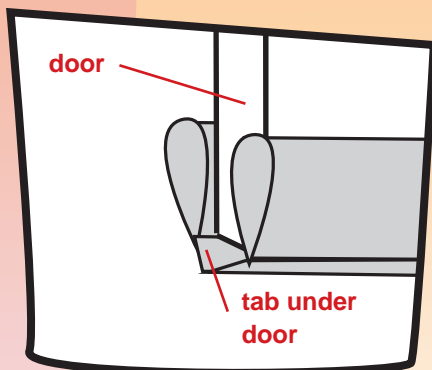
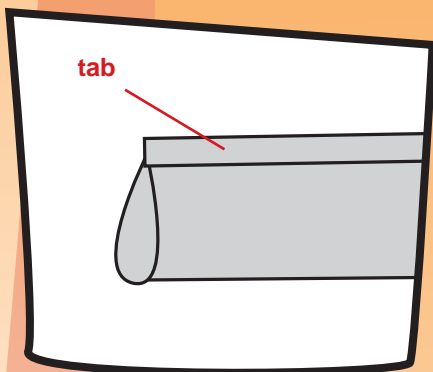
You will need:

- Fabric (twice as wide as your door – for each side)
- Measuring tape
- Scissors
- Thread
- Needle and thread
- Pins
- Sewing machine
- A funnel to add the stuffing
- Something to stuff the draught stopper – dried beans, gravel stones, rice, scrunched up plastic bags... Use what you have around!

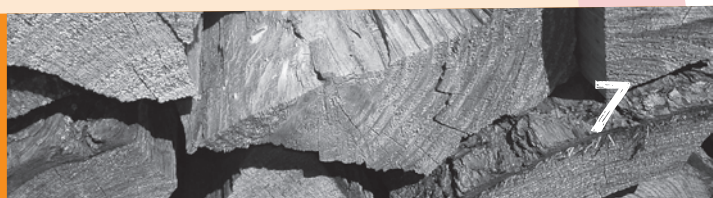
Remember: found objects are best.

Instructions

1. Use the measuring tape to measure the width of your door. This is the length of fabric you will need. You can use any kind of fabric – try something you have leftover. Even some old pants could work well. The fabric needs to be approximately 150mm wide also.
2. Fold the material in half lengthwise with the wrong side of the fabric facing up.
3. Sew the long edge and one of the short ends together and turn inside out.
4. Fold the top (unsewn) edge of the fabric over about 15cm towards the middle of the fabric and pin in place.
5. Use the sewing machine to sew this pinned seam. This is the tab that attaches to the door.
6. You can now stuff the tube – use your hands or the funnel to help. Remember to make it quite full so it blocks the draft effectively. If you are using something like rice or dried beans you might like to put it in plastic bags before adding to the tube so it doesn't fall out the sewn seams.
7. When the tube is as full as you would like, sew the final two edges together. Ta-da! You have made one tube!
8. Repeat steps 1-7 to make another tube for the other side of the door.
9. When you have your two identical tubes, lay one on top of the other and pin the two tabs together.
10. Sew along this pinned part to join the tubes.
11. To use - slide the sewn tab under the door so the filled tubes are on either side of the door. When you push the door it should push the tubes along the floor rather than rolling over.



Congrats! You're finished! Good work.



Rotorua Inversion Layer

cough!

If you've ever been to Rotorua on a winter's day you may have noticed a layer of what looks like fog over the city. This is not fog! It's called an inversion layer and is a collection of trapped smoke. 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. The air pollution from sources like home fires gets trapped with this cold air and as the mountains stop wind getting in, it stays there - so we breathe it in. Eew!

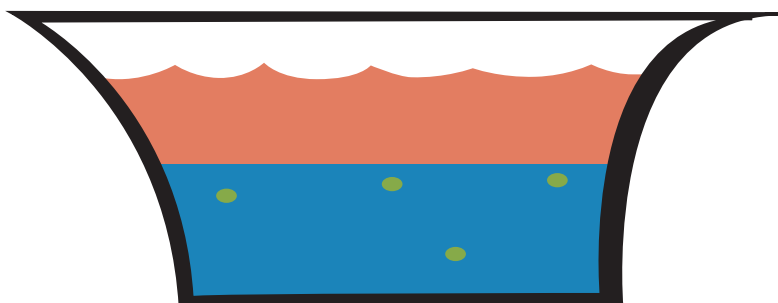
Why not try out the activity below to find out just what causes an inversion layer.

Inversion Activity

from Greater Wellington's Take Action for Air

What you will need:

- Large glass bowl or aquarium
- Measuring cup
- Funnel
- Salt
- Three different coloured food colourings. We used red, blue and green.



Fill the glass bowl or aquarium a bit less than half full with water. Add a few drops of red food colouring to the water and stir. The red water represents warm air which is lighter than cold air.

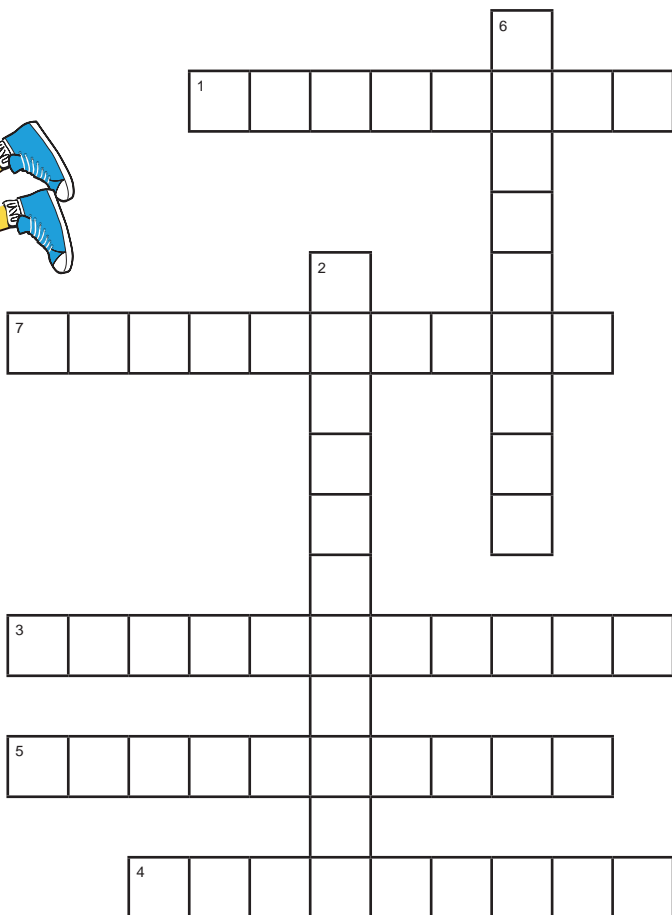
Fill the measuring cup with warm tap water and keep adding salt to it until no more will dissolve. You will have to stir the water to make the salt dissolve. Add blue food colouring to this water. This blue water represents the cold air which is heavier than warm air.

Place the base of the funnel at the bottom of the bowl. Pour the blue water (cold air) through the funnel. You should end up with two layers of water, blue on the bottom and red on the top.

This is what happens in an inversion – the cold heavy air (blue water) gets trapped under the warm air (red water). If we add pollution in these conditions what do you think will happen?

Now we can use the green food colouring to represent pollution. If we add this to the bowl drop by drop you will see that it doesn't mix and just becomes trapped in the air where it is released. In calm, still conditions (like those that occur in Rotorua) this is what happens to pollution released. It is this trapped pollution that can be breathed in by people causing health problems.

Crossword



Answers next issue

1. What you put in your fireplace. Dry is best.
2. The tiny pieces of wood and coal in smoke.
3. Half of all households in Rotorua use these to heat their homes in winter.
4. The layer of pollution that hangs over Rotorua on a still winters day.
5. What's put in houses (ceilings, windows etc) to keep me warm.
6. Human made sources that make the air dirty.
7. Rotorua has poor..... (the term that describes our clean our air is.)

FACT FILE

Killer smogs caused by coal burning fires in London in 1952 and 1956 killed over 5000 people and led to the banning of home fires in the city.

London now has lower levels of PM₁₀ than Rotorua, even though its winters are colder and its population is much larger (in the millions!)



Entry form for **Mythbusters** competition

Name: _____

Address: _____

Age: _____

Send entries to:

Pollution Busters Club
Environment Bay of Plenty
Freepost Environment
Bay of Plenty
PO Box 364, Whakatane 3158

Mythbusters Competition

Circle the correct answer in the true false questions below and be in to win!

- 1 Home heating (domestic fires) are the leading cause of air pollution in the Bay of Plenty region.
True False
- 2 Rotorua's bad air is because of the rotten eggs smell from the geothermal areas.
True False
- 3 The best time to collect wood for your fireplace is summertime.
True False
- 4 If the air looks clean that means that it's healthy.
True False
- 5 The formation of the land around a town or city can affect the air quality.
True False





Michael

What do you do?

I've been working for Environment Bay of Plenty over the summer. Josette (my work mate) and I have been out and about surveying in Rotorua, asking residents about how they heat their homes, how much wood they burn, where they collect their wood from, and many other questions.

Rotorua is known for its poor air quality, so the information we gathered has been really important, in that it provides Environment Bay of Plenty with some useful information to improve the air and improve peoples health.

How did you become the an Air Quality Planning student?

I studied a four year degree in Resource and Environmental Planning at Massey University. I saw that Environment Bay of Plenty offered students jobs over the summer, so I applied, and luckily I got the job! I'm passionate about the environment, and have always wanted to get involved in a career where I can help keep NZ green.

What do you like best about your job?

I've really loved being out and about in the sun most days. It's great to have a job where you aren't tied down to a desk, staring out a window wishing you could be outside! My co-worker has been awesome too, which makes the days go much faster!

This photo shows
the inversion layer
in Rotorua. Ew!



BuzzBOPs Friends

Michael Duindam & Josette Moore

Josette

What do you do?

Household surveys in Rotorua, asking people questions about their fireplaces, such as: how often they use it; how much wood they burn etc, then writing a report about the findings to help improve the Air Quality for Rotorua.

How did you become the an Air Quality Planning student?

I studied for 3 years at the Bay of Plenty Polytechnic and Auckland University of Technology and graduated with a Bachelor of Applied Science in Marine Science and Environmental Management. I love working in the community and thought this job would be a great experience for me. I am also from Rotorua so I wanted to help in making the air cleaner for the residents.

What do you like best about your job?

I have enjoyed being out and about in the community. I also enjoy the conservation education side to what I do, so I got to educate people about sustainable heating options and any other questions they had.

Do you have any messages for Pollution Busters?

We can help keep our air clean by burning dry/seasoned wood and upgrading old fires, this will also keep us warmer in winter and keep our lungs healthy. Stay involved in the environment, make your voice count and never give up on things you are passionate about. “He pōkeke Uenuku I tū ai” Against a dark cloud the rainbow stands out brightly.

Wood Pile answers. A – not lifted off the ground. B – no tarpaulin or covering. C – correct!

Pollution Busters Corner

Milkbox Treasure Chest

We had some fantastic entries for our Milkbox Treasure Chest and couldn't pick between two so these lucky people are receiving a signed copy of Nikki Slade Robinson's book 'That's Not Junk.'

Amos Christophers Tāneatua, 10yrs – Amos made a fantastic BuzzBOP chest!

Bailey and Kane Johnson from Ōpōtiki decorated their cool chest with car stickers. Good work boys! Keep an eye on your mailbox for your new book.



Congratulations!

Thanks to all who entered our Cool Coastlines jigsaw competition. The lucky winners are...

Up to 6yrs

Shila Green, Greerton, 3 1/2yrs

7 to 11yrs

Maria Robinson, Ōpōtiki, 11yrs

12yrs & over

Jacob Bond, Rotorua, 12yrs

The correct answer was – Pingao helps protect the dunes. Many of you put Pim helps protect the dunes which we also took as correct!



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) _____

BuzzBOP & Team

Freepost Environment
Bay of Plenty
PO Box 364
Whakatane 3158
buzzbop@envbop.govt.nz

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.