

Bush Telegraph

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2004

JOIN IN & CELEBRATE WORLD OZONE DAY!

The international community has been celebrating World Ozone Day on the 16th of September since 1995. On that day most of the countries in the world agreed to take action to protect our ozone layer. The theme for the 2004 celebration is:

SAVE O₃UR SKY: Ozone Friendly Planet, Our Target

Let's find out who and what is involved!



The Sun is the closest star to us.

It is mostly made up of hydrogen (75%) and helium (24%) gas.

It gives us all our energy.

OZONE LAYER

The Ozone Layer is a thin layer in our upper atmosphere. It is there to protect us from the harmful rays of the sun.

EARTH



Planet Earth is home to many different kinds of living things. Life is very special here.

PEOPLE



There are approximately six billion people on Earth. Each person needs food, water and shelter to survive.

DID YOU KNOW?

- ?! The lower part of the stratosphere is cold and clear making it comfortable for airplane travel.
- ?! Ground-level air pollution can help block dangerous UVB rays but what about the dangers to your health from the pollution?
- ?! Some farmers in the world put sunblock on their livestock to prevent them from burning and developing illnesses.
- ?! Sunburn can lead to skin cancer, eye cataracts and disturbance to the marine food chain.

OUR PLANET'S PROTECTIVE BLANKET: the Ozone Layer

Our Planet Earth is a large ball that is approximately 40,000 kms all the way around. The Earth's inside is made of different kinds of rock most of which are very hot. The outside of our planet is surrounded by a thin blanket of gasses that is called the atmosphere.

The Atmosphere

The atmosphere is a protective layer like the skin on an orange. Without it, there would be no life on Earth as there is today. It protects the Earth from the powerful rays of the sun and meteorites. The atmosphere controls and/or gives Planet Earth air, water and warmth. Just as we are affected by the atmosphere, it is also changed by our activities. The atmosphere has several layers due to changes in temperature and pressure.

OZONE ID

O₃

WHAT IS IT? Ozone is a gas made up of three oxygen atoms. It is chemically written as O₃.

CHEMICAL PROPERTIES: Two of the oxygen atoms are joined together very tightly. The third one is only loosely connected. This means that ozone can easily be converted into a different gas.

PHYSICAL PROPERTIES: It has a bluish, clear colour that is difficult to see. Sometimes you can smell it after a thunderstorm as lightening will change some ozone into oxygen. This gives off a strong smell.

WHERE IS IT LOCATED? 10% of the atmosphere's ozone is in the troposphere. The other 90% called the **OZONE LAYER** is in the stratosphere.

LAYERS OF THE ATMOSPHERE

THERMOSPHERE

80-300 KM

Very thin and hot air layer

MESOSPHERE

50-80 KM

Meteors ("shooting stars") burn up

STRATOSPHERE

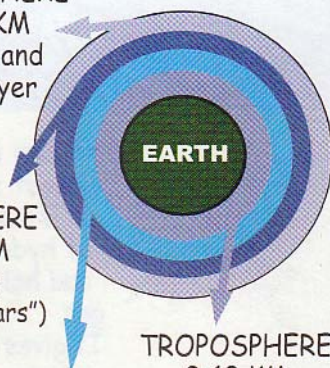
10-50 KM

Ozone Layer

TROPOSPHERE

0-10 KM

Weather and cloud layer



The ozone layer protects life on Earth. It absorbs 97-99% of the sun's dangerous Ultra-violet (UV) rays. Although sunlight is needed there are some sun rays that we cannot see and they can be dangerous. There are three kinds of UV rays:

UVA rays: Not very dangerous to us and can pass through the ozone layer. (It is healthy to have some UVA light as it helps us to make vitamin D.)

UVB rays: Dangerous to us and the ozone layer blocks almost all of it.

UVC rays: Very dangerous to us and the ozone layer blocks almost all of it.

OUR BROKEN FILTER: ozone breakdown

In the last 100 years, humans have made discoveries and have invented machines and materials that have changed the way we live. For example, cars, computers, refrigerators and cleaning solutions. Today we use these things as if they have always existed. Few of us actually know how or what makes them work. Unfortunately many of these inventions use dangerous chemicals to work.

OZONE DEPLETING SUBSTANCES (ODS) IN NAMIBIA

The chemicals shown here are called Ozone Depleting Substances (ODS). The main uses for ODS in Namibia have been:

- Household refrigerators and air conditioners in cars
- Industrial refrigeration for fish and meat processing and beer brewing
- Fire protection services

These chemicals are very stable and do not react easily. This means they travel through the air all the way to the stratosphere. Only here, where they are exposed to very intense levels of UV rays, do they react. The chlorine or bromine found in the chemicals break down thousands of ozone (O_3) molecules into oxygen (O_2).

This makes the ozone layer thinner.



CFC-Chlorofluorocarbon

WHAT: Chlorine + Fluorine + Carbon

USE: Cooling systems, solvents and foam blowing agents.

HALON

WHAT: Bromine + Fluorine + Carbon

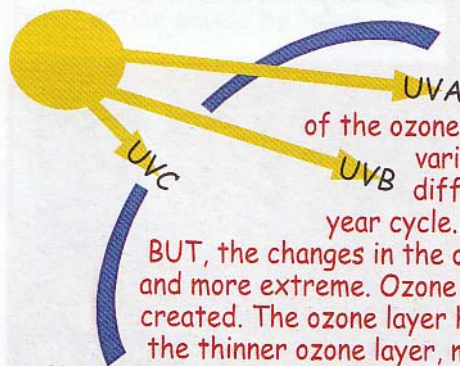
USE: Fire-extinguishers



CARBON TETRACHLORIDE

WHAT: Carbon + Chlorine

USE: Dry cleaning



TOO MUCH UV-B LIGHT IS GETTING THROUGH

It is natural and normal that the thickness of the ozone layer changes every year and that it is varies around the world. The sun also produces different amounts of UV rays based on an 11-year cycle.

BUT, the changes in the ozone layer over the past years are faster and more extreme. Ozone is being destroyed faster than it can be created. The ozone layer has become thinner worldwide. Because of the thinner ozone layer, many more dangerous UV rays (especially UVB) are reaching the Earth. The exact damage caused by this to living things is a bit unknown. Many of impacts may multiply and the damage may only be seen in the years to come.

WHAT IS THE DAMAGE?

Let's look at how UVB rays can damage life on Earth.

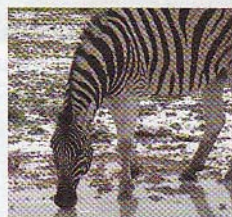


HUMANS - Some effects of the sun we can see immediately like a sunburn. Other effects caused by dangerous UVB rays may only appear after several months or years. For example, skin cancer, permanent eye damage and weakened immune systems.

ANIMALS - Other animals may also be affected. For example, on areas of the body where mammals do not have hair (around the mouth and nose) they may develop skin cancer.

Some scientists believe that penguins living in the Antarctic

may be in danger. Penguins hunt for small fish using their eyesight. If UVB rays damage the penguins' eyes then they may not be able to hunt and therefore the whole food chain around the Antarctic will be disrupted.



MARINE LIFE - Most of life in the oceans lives close to the surface. UVB rays can penetrate even beyond the surface down to several tens of meters deep. UVB rays may damage phytoplankton which are the basis for the ocean's food chain and provide the world with 50% of its oxygen.



PLANTS - Most plants have some level of protection against UVB rays in their leaves. Some crops that are grown for food are UVB resistant while others are not. It is unclear what the long-term affect on natural forests may be.

WHAT CAN I DO?

There are many things that you can do to protect yourself from the sun's dangerous rays. Do you do these things already?

- Use sunscreen every time you go outside
- Wear a hat and sunglasses
- Stay in the shade
- Wear long-sleeved shirts and long pants

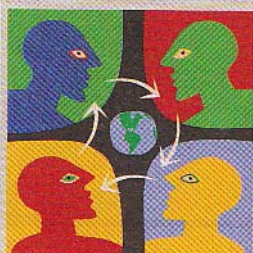
You can do more and become a friend of the ozone layer!

- Look for the label and make sure you buy ozone safe products, especially spray cans.
- Find out if your refrigerator and air conditioner uses ODS.
- When buying a new refrigerator, make sure it is Ozone Friendly.



100% (H)CFC FREE
OZONE SAFE

GOVERNMENTS TAKING ACTION



The depletion of the ozone layer is a global concern. The whole world must work together to solve this issue as it cannot be done alone. But how? One very important step is to have each country accept that the depletion of the ozone layer needs to be stopped. Then all of the world's governments can come together to discuss the issue. They must investigate everything about the issue by asking: who, what, where, when, why and how? Together they can then form guidelines (policies) as to what must be done. **Let us look at what the world's governments have done to address the depletion of the ozone layer.**

HISTORY OF TALKS

In the mid-1970s, the first scientists reported that CFCs may be depleting the ozone layer. By this time, industries had already been using CFCs for 40 years. It was another ten years until the international community met in 1985 in Vienna. There they acknowledged the existence of the problem, promised to work together and thereby adopted the Vienna Convention. Two years later another meeting was held in Montreal, Canada, to determine what action should be taken.

NAMIBIAN GOVERNMENT SIGNS ON

3 September 1993 - Montreal Protocol signed
1994 - "Country Programme" developed to begin implementation
1996 - National Ozone Office established

MONTREAL PROTOCOL on SUBSTANCES that DEplete the OZONE LAYER

16 September 1987

This international agreement has been signed by almost all the governments of the world. By signing the Protocol, a country agrees to:

- Control the national production of ozone depleting substances (ODS)
- Control the consumption of ODS according to the amount and timeline set by the agreement. The Montreal Protocol has had several additions to it called amendments. They are based on new information about ODS from science and industry. The aim of the Montreal Protocol is to completely phase out all production and use of ODS worldwide.

NAMIBIA'S PROGRESS

Namibia has been importing ODS and ODS products. Look at the table to see how far we have come in reducing the amount of the two main ODS used in Namibia.

	YEAR	CFC	HALON
	1994	31.3t	2.7t
	2003	17.2t	0
(in metric tonnes)	2008	0	0

To get more information about the National Ozone Office contact them at: Ministry of Trade and Industry, National Ozone Office, P/Bag 13340. Windhoek
 Tel: (061)283 7278 Fax: (061) 221 729 E-mail: uugwanga@mti.gov.na

PERSONALITIES IN CONSERVATION

Name: Petrus Ugwanga

Organisation: National Ozone Unit, Ministry of Trade and Industry.

Job Title: National Ozone Officer

No of years on the job: 4 $\frac{1}{2}$

What is the National Ozone Unit? It is a functional unit within the Ministry of Trade and Industry that was created in 1996 to coordinate and oversee the implementation of the Montreal Protocol.

What are your main activities? The Ozone Unit has many activities. The main ones are public and industrial awareness, and training for both refrigeration and air conditioner technicians as well as for custom officials who are stationed at all our border posts. We compile and report data to the Ozone Secretariat on the consumption of ODS.

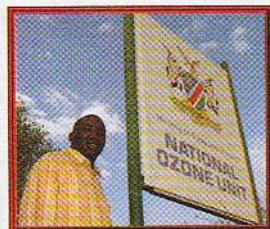
Who do you work together with? We work with various ministries, training institutes and international agencies. For training activities we work with the vocational training centers and the Ministry of Finance. We are sharing ideas and information with the Ministry of Environment and Tourism as they are the custodians of the environment. We also work closely with the United Nations Environment Programme through its division of Technology, Industry and Economics and with GTZ-Proklima. GTZ-Proklima provide us with technical and financial assistance through a bilateral agreement between Namibia and Germany.

Can you share any recent developments within the Ministry of Trade and Industry regarding ozone? Our Honorable Minister has recently passed a notice that will take effect on the 1. January 2005. This notice will restrict the importation of ozone depleting substances and will ban the importation of equipments that are designed to use ODS into Namibia. Accordingly importers will be required to obtain a special permit prior to importation of any of the listed ODS. All equipments that are designed to use ODS are totally banned. For example, ODS-using refrigerators.

What are your biggest challenges in your work? I believe that in the near future we will be faced with a challenge of curbing illegal trading. Illegal trading cases are not yet apparent in Namibia, it is anticipated that with the tightening of measures it may pose challenges. Another linked challenge is that developed countries may try to dump obsolete technologies into developing countries like Namibia. But we are equally ready to ward them off!

What do you enjoy the most about your work? The co-ordination role that I play. I really like to coordinate between the government, international and local agencies. For example, mobilizing and facilitating the flow of information and resources between different parties.

Petrus' Message for Namibia's Youth: We must start caring for our environment so that the environment in return will take care of us in the future.



FOR THE BEGINNER READER: SATELLITES

How do we even know that the ozone layer is being depleted? Can we just tell? No. Scientists must find out how many ozone molecules (O_3) are in the ozone layer. In order to measure ozone, scientists need to be able to get their instruments to the ozone layer. Remember where the ozone layer is? Yes, in the stratosphere.

SATELLITES



A satellite is a body that revolves around a planet. This movement is called orbiting. The moon is Earth's one natural satellite. Humans have learned how to make their own satellites. There are hundreds of humanmade satellites orbiting the Earth today.

ORBITING

Satellites must keep a certain speed to continue to travel around the Earth. If a satellite slows down, it can lose its orbit. After some time, it will fall into our atmosphere. Here it will burn up.

DIFFERENT KINDS OF SATELLITES

A satellite can be any shape. For example, a ball, drum or box. The shape and size of a satellite depends on the job it is designed to do. Satellites are used for communication, navigation, scientific study, the military and to collect weather data. Sometimes you can see a satellite in the sky. It looks like a moving star. On Earth we have many satellite receivers. Do you have one? Check out these below!



Global Positioning System (GPS)



VSAT Telephone



DSTV

THE AURA SATELLITE: Measuring Ozone

The Aura Satellite was put into orbit earlier this year. It is an advanced weather satellite that is designed to measure how much the ozone layer has recovered. It weighs almost 3,000 kgs and should orbit at a distance of 720 kms away from the Earth's surface. It is hoped that it will last for six years. It has four special instruments with which to take measurements. In addition to measuring ozone levels, Aura is also going to study how pollution moves in the atmosphere and how our climate is changing. Scientists believe that these factors may affect the recovery of the ozone layer.

SPACE JUNK

There are lots of satellites orbiting the Earth that are broken but have not fallen into the atmosphere yet. Do you think that is litter?



FOR THE ADVANCED READER: CLIMATE CHANGE



Are you wondering what global warming and the greenhouse effect have to do with the depletion of the ozone layer? Although there are some similarities, they are quite different. Let us see how they are linked.

WORKING DEFINITIONS

Climate - Normal weather conditions in an area.

Climate change - Alteration of climate in an area.

Global warming - A type of climate change where the Earth's temperature is increased linked to the greenhouse effect.

THE GREENHOUSE EFFECT

The greenhouse effect is the warming of the atmosphere by the reflection of some of the sun's rays back onto the Earth. We need some warming otherwise the world would be too cold. But, because of human activities gasses that are involved in trapping this heat have increased.

The gasses are: Carbon Dioxide (CO_2), water vapour, Methane (CH_4), Laughing Gas (N_2O), CFCs and Ozone (O_3).



THE BAD OZONE

With increased UV rays reaching the Earth, more ground-level ozone is being created called smog. This form of air pollution is common in cities and is very dangerous for all life.

THE LINK TO THE OZONE LAYER

Both problems, the depletion of the ozone layer and global warming, are caused by the release of too many unwanted gasses in our atmosphere. Ozone gas that is good in one place is harmful in another. The good news is that due to international cooperation it is believed that through the natural production of ozone the ozone layer can be healed in about 50 years. The bad news is that scientists are unsure what effect other greenhouse gasses may have on the natural production of ozone in the stratosphere.

WHY IS IT HAPPENING?

Simple. Too many fossil fuels are being burned too quickly. Worldwide we are dependent on petrol, oil, gas and coal for our transportation, heat and electricity at home and in industries. The stored up energy in the fossil fuels is being released mostly as carbon dioxide. At the same time, we are also deforesting. This means that there are fewer plants to absorb the evergrowing carbon dioxide to convert it into oxygen.

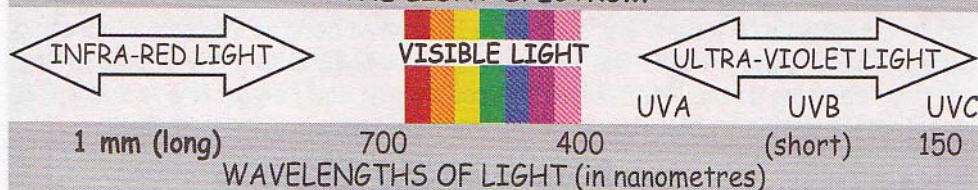
WHAT CAN WE DO ABOUT IT?

If the Montreal Protocol to reduce ODS is working, why can we not have another international agreement to slow down greenhouse gasses? We do! It is called the Kyoto Protocol. Unfortunately many countries have not agreed to the Kyoto Protocol's guidelines and some people believe that they are not strict enough. To reduce greenhouse gasses it means we need to really change the way we live. This can be very expensive and "less comfortable".

OZONE ACTIVITY PAGE: Learn about light

We have discovered that there are different kinds of light. Some we can see (visible) and some we cannot see (Ultra-violet (UV) and Infra-red). We already know that some UV light from the sun is harmful to us if it is not blocked by the ozone layer. Other UV light can be very useful to us. For example, fluorescent lamps often used in office and school buildings convert UV light into visible light. Although you also cannot see Infra-red light, many of us use it everyday when switching on a TV with a remote control. Let us explore more about light.

THE LIGHT SPECTRUM



Different kinds of light are determined by wavelength and frequency. As you can see in the light spectrum, visible light has wavelengths between 400-700 nanometres. Ultraviolet light has shorter wavelengths and Infra-red light has longer wavelengths. What is a wavelength?

MATERIALS:

Flat container
Water



WAVELENGTH EXPERIMENT

- 1) Fill the flat container with water.
 - 2) Dip your fingertip in and out of the water.
- What happened? You should have created a wave. A wavelength is the distance from the top of one wave to the next.



Although light looks like it is colourless or white, it is actually a mixture of all colours. Can you make your own spectrum of light?

MAKING A LIGHT SPECTRUM EXPERIMENT

- 1) Fill the flat container with water
- 2) Put the container in direct sunlight
- 3) Take the thick board and cut out a thin, small rectangle.
- 4) Put the board next to the water-filled container. The sunlight should pass through the small rectangular opening you have cut.
- 5) Place the mirror opposite the board into the water.
- 6) Move the mirror until you have created a rainbow on the board.

MATERIALS:

- Flat container - Water
Thick board - Small mirror
Scissors



THE BIGGER PICTURE

Just as much as it seems that the world is a big place with many different kinds of animals and plants, it is also a small place. Earth is only one planet in our solar system in our galaxy within the universe. BUT it is the only planet that we have so it is important that we take care of it.

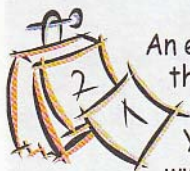


ON THE ROAD TO SUCCESS...

A global problem, a global solution! Although the ozone layer is not completely fixed, it is becoming better not worse. This is due to the world's countries working together to solve the problem. On 16 September the world is celebrating World Ozone Day. What is the celebration about? It is to make people aware of the depleting ozone layer, what the causes are and how to try to solve the problem. It is also a celebration of international cooperation and unity.

THE ENVIRONMENTAL CALENDAR

An environmental calendar shows all of the environmental celebrations throughout the year. Have you ever celebrated any environmental days? Here are some environmental days in the next few months. You can get your own environmental calendar on the Internet at www.neen.iway.na.



16 SEPTEMBER	WORLD OZONE DAY
4 OCTOBER	WORLD HABITAT DAY
11 OCTOBER	ARBOR DAY (Namibia)
16 OCTOBER	WORLD FOOD DAY
1 DECEMBER	WORLD AIDS DAY



CONTEST!!! CONTEST!!! CONTEST!!! CONTEST!!! CONTESTS!!!

To celebrate World Ozone Day, the National Ozone Office is sponsoring prizes for this contest. Prizes to be won are a hat (1st place), cap (2nd place) and poster (3rd place)!

To enter the contest, answer the following three questions:

- 1) Which chemicals are depleting the ozone layer?
- 2) How can humans protect themselves from the sun's dangerous UVB rays?
- 3) Why is it also important to protect all other living things?

Send your answer by the **24 October 2004** to:
World Ozone Day Contest, NaDEET, PO Box 31017, Pioniers Park

Make sure to include your name, age and address



Chinga's & Nzovu's Corner



Thank you to all for sending your questions to us. It is wonderful to see our readers asking so many questions about the world around them. If you have any questions for Chinga and Nzovu, please write to:

Chinga & Nzovu, NaDEET, P.O. Box 31017,
Pioniers Park, Windhoek

Dear Chinga
and Nzovu

Why do zebras have stripes?

From Achim in
Windhoek

Dear Achim

Most likely zebras have their black and white stripes to protect themselves. The stripes help them to be camouflaged when they are in their herd. When they are attacked by a predator, for example a lion, the zebras will run in various directions. This movement is very confusing to the lion because it will be difficult for it to tell one zebra from another. The zebras therefore use their stripes as a type of defence.

Chinga and Nzovu

Dear Chinga and Nzovu,
What is the difference between a
tree and a bush?

From Michaella in Gobabis

Dear Michaella,
You have asked a very difficult question. There is no one agreed upon scientific definition for a tree. We want to try to give you answer that will help you. However, it may not always apply and some scientists may have a different definition.

- A tree is a woody plant. It continues to live and grow over many years (perennial). A tree usually has one stem. If a tree is multi-stemmed then it usually develops these stems a little bit from the ground. It usually is at least 2 metres tall.
- A bush has many branches but not one main stem. It is usually short.



A multi-stemmed fig tree



A Grewia bush with many stems.
Commonly known as a raisin bush.



Many Mopane trees
growing close together.
Each has its own stem.

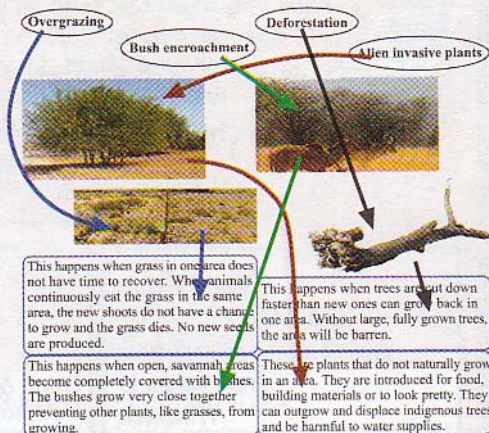
Chinga and Nzovu

UPDATES FROM LAST ISSUE

ANSWERS TO THE PLANT HUNT (pg 4) & PLANTS IN TROUBLE (pg 5)

PLANT HUNT - There are many answers that you could have given. Here are some possibilities:

- | | |
|-----------------------|-------------------|
| 1) Fencing poles | 10) Roll holder |
| 2) Firewood | 11) Guitar |
| 3) Car tyres (rubber) | 12) Pillow |
| 4) Curtains | 13) Picture Frame |
| 5) Dresser | 14) Marula oil |
| 6) Reed mat | 15) Clothes |
| 7) Porridge | 16) Hat |
| 8) Writing Paper | 17) Chair |
| 9) Toilet Paper | |



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yes, ☐ please send me additional copies.

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The Bush Telegraph is written by Viktoria Keding.