What are greenhouse gases?

a) Gases that trap heat above the earth

b) Gases that are made by plants growing in greenhouses

c) Gases used to heat greenhouses so they are warm enough for plants to grow

Which of the following is **NOT** a source of methane?

a) Landfills

b) Cattle

c) Clouds

**Scientist predict that in the next 100 years global warming will cause water levels in oceans to:**

a) Decrease at least 100 cm

b) Stay the same

c) Increase by 15 to 95 cm

**Compared to 1860, how much carbon dioxide ($CO_2$) is in the air today?**

a) 80% more

b) There is less carbon dioxide in the air today than in 1860

c) 25% more

**(A) Gases that trap heat above the Earth**

Greenhouse gases trap some of the heat and this heat is what makes the Earth warm enough to support life. But too much greenhouse gases in the atmosphere can cause parts of the planet to get too warm.

**(C) Clouds**

Clouds do not produce methane. Garbage decomposes very slowly when it is in a landfill because there is no oxygen. However, methane is produced from this process. Cattle also produce methane when digesting their food.

**(C) Increase by 15 to 95 cm**

Many scientists predict that global warming will cause the water in oceans to go up between 15 and 95 cm in the next 100 years. This would mean serious habitat loss and alteration for coastal communities and wildlife.

**(C) 25% more**

$Co_2$ is the greenhouse gas that people make the most of. Two of the biggest sources of $CO_2$ are burning fossil fuels and cutting down and burning trees. The more $CO_2$ we put into the air, the more the temperature could rise.

**Where are the other NOAA stations located?**

a) Trinidad, California and Pago Pago, American Samoa

b) Barrow, Alaska and the South Pole, Antarctica

c) both of the above

**What is causing the gradual warming of the Earth's atmosphere?**

a) Ozone

b) Waste Gases

c) Nitrogen

**Clouds are made of**

a) Ozone

b) Nitrogen and Methane

c) Water droplets and ice crystals

**Which instrument transmits photographs and cloud patterns allowing scientist to study their type and movement?**

a) Weather Satellite

b) Radiosonde

c) Psychrometer

**(C) All of the Above**

There are other NOAA stations in:
Trinidad, California
Pago, Pago, American Samoa
Barrow, Alaska
The South Pole, Antarctica

**(B) Waste Gases**

Waste gases from factories, power plants, and cars are building up in the atmosphere and trapping too much heat near the Earth's surface

The Ozone protects the Earth from harmful UV rays, and Nitrogen is the most abundant gas in the air.

**(C) Water droplets and ice crystals**

Clouds are made up of billions of water droplets and ice crystals that are so tiny and light that they float in the air.

**(A) Weather satellite**

Weather satellites send photographs of clouds patterns to help scientist forecast weather. A psychrometer helps scientist determine relative humidity of the air. A radiosonde helps scientist gather data in the upper atmosphere.

**Scientists measure wind speed with a**

a) wind vane

b) anemometer

c) radiosonde

**Increased UV radiation can**

a) increase risk of skin cancer

b) decrease the number of frogs and toads

c) both of the above

**Where would you most likely receive the greatest sunburn?**

a) Bayfront soccer field

b) On Saddle Road

c) At Mauna Loa Observatory

**Sunscreens are rated by the SPF number. Which would provide the best protection?**

a) SPF 15

b) SPF 8

c) SFP 30

**(B) Anemometer**

An anemometer has small cups, mounted on horizontal arms which spin on an axis to measure the speed of wind.

A wind vane is used to determine wind direction.

**(C) Both of the above**

An increase in UV radiation is known to increase the risk of skin caner. Researchers believe that the increased UV also destroys the eggs of toads and frogs.

**(C) At Mauna Loa Observatory**

Since the atmosphere blocks out most of the harmful UV rays that causes sunburn, the higher you travel in altitude the less atmosphere above you. Therefore, you will increase your chance of sunburn at the higher altitudes.

**(C) SPF 30**

Sunscreens are rated by the sun protection factor (SPF) number. The higher the number, the longer you can stay in the sun without getting sunburn.

**Which of these is NOT part of Earth's atmosphere?**

a) Troposphere

b) Polarsphere

c) the Ozone layer

**What is the Elevation of Mauna Loa Observatory?**

a) 3,397m

b) 6,678m

c) 12,078m

**No one has seen the mysterious "White Dog of Mauna Loa" since what year?**

a) 1959

b) 2004

c) 1966

**What does the "Keeling Curve" show?**

a) $CO_2$ concentration level

b) atmospheric absorption

c) the Ozone layer

**(B) Polarsphere**

The Troposphere is level of atmosphere closest to Earth. The Ozone Layer is the part of the atmosphere that protects us from harmful UV rays.

**(A) 3,397m**

The Mauna Loa Observatory is located at 3,397m.

**(C) 1966**

The White Dog of Mauna Loa was first seen in 1959. It was periodically seen in the months leading up to a volcanic eruption on the mountain. Legend says that the dog belongs to the fire goddess Pele. No one has seen the dog after its last disappearance in 1966.

**(A) $CO_2$ concentration level**

The Keeling Curve is a chart showing Carbon Dioxide concentration in the atmosphere. Dr. Charles D. Keeling was the first to recognize that carbon dioxide levels were rising.

In what layer of the atmosphere does the Ozone layer lie?

a) Thermosphere

b) Stratosphere

c) Mesosphere

When Ozone is closer to the Earth's surface what is the result?

a) it can be destructive

b) the protection increases

c) nothing

What is the abbreviation for Ozone?

a) OZ

b) $O_3$

c) O

As the ozone in our atmosphere decreases, solar radiation

a) stays the same

b) increases

c) decreases

**(B) Stratosphere**

The Ozone layer lies between 6 and 25 miles above the Earth's surface.

**(A) It can be destructive**

When Ozone is too close to Earth's surface, it can damage the living tissue of plants and animals. Low-lying Ozone is also a key component of the smog that hangs over many cities.

**(B) $O_3$**

Oxygen molecules ($O_2$) are struck by the sun's rays and split into single Oxygen atoms. These become strongly reactive and bond with nearby molecules creating Ozone ($O_3$)

**(B) increases**

**There is an inverse relationship between ozone and solar radiation. As the ozone layer gets thinner, more UV is able to get through to Earth.**

Which of the following is **NOT** a greenhouse gas?

a) Methane

b) Oxygen

c) Carbon Dioxide

Which of the following greenhouse gas is **NOT** found in nature?

a) Nitrous oxide

b) Methane

c) Halocarbons

**Many scientists predict that global warming will cause the water level in the oceans and seas to go up. Which of the following answers is NOT a reason why ocean levels will rise if global warming occurs?**

a) When water gets warm it takes up more space

b) When sea ice and glaciers melt they add water to the ocean

c) Rain drops will be bigger so more water will fall into the ocean.

**What are scientists who study weather called?**

a) Rainologists

b) Meteorologists

c) Biologists

**B**

Oxygen

**C**

Halocarbons

**C**

A is true – As water gets warmer, it takes up more space.

B is true – Increase in temperatures will cause sea ice and glaciers to meld, adding more water to oceans

B

Meteorologists