

Name \_\_\_\_\_



## Air - The Atmosphere

By Sharon Fabian

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When you get chilly, you might wrap up in a nice warm blanket. The earth has a blanket too, called the **atmosphere**. We call it **air** for short. The blanket of air that surrounds the earth keeps us comfortable. We wouldn't be able to live on Earth without an atmosphere.

Earth isn't the only planet with an atmosphere. Some planets have an atmosphere made up of toxic chemicals. Some big planets, like Jupiter, are all atmosphere. Earth, however, is the only planet that we know of, so far, that has an atmosphere that makes life possible.

Earth's atmosphere is made up of many different chemicals, most of them in very small amounts. The main chemicals in air are oxygen at 21%, nitrogen at 78%, and argon at less than 1%. Some other chemicals that are there in very small amounts are important too. There is carbon dioxide, water vapor, ozone, and man-made gasses including chlorofluorocarbons (CFC's).

The atmosphere is arranged in layers around the earth. The layer closest to the earth is the **troposphere**. It is a thin layer, only about seven to eight miles thick. The troposphere is where the clouds are. It's where thunderstorms, and all the rest of the weather happens. It's the part that recycles our water for us. It's where most of the airplanes fly. The next layer is the **stratosphere**. It's where the Concorde flew, and where some supersonic military planes fly. The stratosphere is where the ozone layer is. The **mesosphere**, the **ionosphere**, and the **exosphere** are beyond the stratosphere. The atmosphere in these three layers gradually gets thinner and thinner until there is no atmosphere left. Beyond that is **outer space**.

Think of all of the protective gear an astronaut must wear. The gear protects him or her from deadly hazards like extreme cold, and lack of oxygen. The rest of us are protected from these same hazards every day by the atmosphere. The atmosphere provides the oxygen that we breathe. It regulates the earth's temperature. It filters out dangerous solar radiation. It also recycles our water.

If you research to find information about the atmosphere, one of the first things that you will probably find is information about problems with the atmosphere, especially problems with the part called the ozone layer. The ozone layer is the lower part of the stratosphere, about twelve to fifteen miles above sea level. The ozone layer acts like a giant shield that protects the earth from the dangerous ultraviolet (UV) rays from the sun.

Scientists have found that the ozone layer is being worn away in spots by interactions with man-made chemicals, particularly CFC's. CFC's were once used a lot in products like spray cans and cooling systems. They seemed like very useful chemicals at the time; however the scientists later learned that CFC's collect in the stratosphere where they attack the ozone layer. A large hole has been discovered in the ozone layer over Antarctica. NASA scientists have an aircraft called NASA-ER2 that goes out to gather information about the ozone layer. The information is brought back to labs where scientists can study them and make hypotheses about what is happening in our atmosphere. Besides the hole over the Antarctic, they are also studying a smaller hole over the Arctic and other spots where the ozone layer is getting thinner. They are studying how volcanic eruptions affect the ozone layer, and how airplane exhaust contributes to the problem.

Scientists are gathering and studying more and more data all the time, but one thing that they have learned for sure is that the atmosphere is a thin, fragile blanket of air. It's done a beautiful job of protecting us so far, but everything that people do affects the atmosphere in one way or another. If we like our air just the way it is, we'll all have to do our part to keep it in good shape.

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### Questions

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- \_\_\_\_\_ 1. Atmosphere is another word for \_\_\_\_\_.
- A. ozone
  - B. air
  - C. stratosphere
  - D. troposphere



Name \_\_\_\_\_

- \_\_\_\_\_ 2. The layer of the atmosphere where thunderstorms happen is the \_\_\_\_\_.
- A. ionosphere
  - B. troposphere
  - C. mesosphere
  - D. stratosphere
- \_\_\_\_\_ 3. The ozone layer is part of the \_\_\_\_\_ layer.
- A. stratosphere
  - B. ionosphere
  - C. mesosphere
  - D. troposphere
- \_\_\_\_\_ 4. The \_\_\_\_\_ is farthest away from the earth.
- A. ionosphere
  - B. troposphere
  - C. mesosphere
  - D. stratosphere
- \_\_\_\_\_ 5. CFC's \_\_\_\_\_.
- A. are short for chlorofluorocarbons
  - B. are man-made chemicals
  - C. attack the ozone layer
  - D. all of the above
- \_\_\_\_\_ 6. Here on earth, we don't have to wear protective gear like the astronauts do, because \_\_\_\_\_.
- A. it is cooler here
  - B. outer space has a poisonous atmosphere
  - C. the atmosphere protects us here
  - D. we stay indoors most of the time
- \_\_\_\_\_ 7. The NASA-ER2 mainly does which step of the scientific method?
- A. analyze data
  - B. draw conclusion
  - C. gather information
  - D. make hypotheses

- \_\_\_\_\_ 8. Our atmosphere contains \_\_\_\_\_.
- A. only oxygen
  - B. only oxygen, nitrogen, argon, ozone, water vapor, and CFC's
  - C. a toxic mix of chemicals like many other planets in the solar system
  - D. a balanced amount of many different chemicals that makes life on earth possible