

**\*\*Attach in your science notebook. Will be part of next notebook check!\*\***

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

### Introduction to Earth's Atmosphere

**Directions:** Read the passage and pause to complete the homework and thought questions as you go.

**Passage:**

The Earth's atmosphere is a thin layer of gases that surrounds the Earth and is held in place by gravity. The Earth's atmosphere is divided up into four layers: troposphere, stratosphere, mesosphere, and thermosphere. There is no exact place where Earth's atmosphere ends. Instead, it just gets gradually thinner and thinner (less dense) until it merges with outer space where it consists mostly of interplanetary gases such as hydrogen and helium.



**✍ Homework Question:**  
Define and give an example, application or characteristic of Earth's atmosphere.

**✍ Thought Question**

**Predict:** How do you believe the atmosphere is beneficial to life on the Earth?

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The Earth's atmosphere is beneficial to life on the Earth in many ways besides providing oxygen for us to breathe! Earth's atmosphere is made up several different types of gases in large quantities. All of these gases together exert a pressure on our bodies and everything on the Earth. The pressure from the Earth's atmosphere is important in keeping a healthy balance between our inner body pressure and outside air pressure. Have you ever experienced your ears popping when going up in an airplane or traveling up a mountain? That is due to a lowering in air pressure outside compared to the air pressure in your body. Now just think what would happen to you if all of the air pressure was gone! Ouch!

Earth's magnetic field is the first line of defense to protect the Earth from the sun's solar wind and radiation as well as other forms of cosmic radiation. The atmosphere is our second line of defense to protect life on the planet by absorbing ultraviolet (UV) radiation from the sun. The absorbed solar radiation in turn regulates Earth's temperature. Therefore, the atmosphere not only protects us from solar radiation, but keeps the planet warm as well!

Can you think of any other ways that the Earth's atmosphere protects us? What does the atmosphere do to incoming meteors?



**✍ Homework Question:**  
Name at least 4 things our atmosphere does for us.

**✍ Thought Question**

**Apply:** The electromagnetic spectrum is a collection of radiation (light) over a wide range of wavelengths. Humans can only see the "visible light" portion of the electromagnetic spectrum. Ultraviolet (UV) radiation has a shorter wavelength than visible light and can be dangerous to humans. How can you protect yourself daily from UV radiation?

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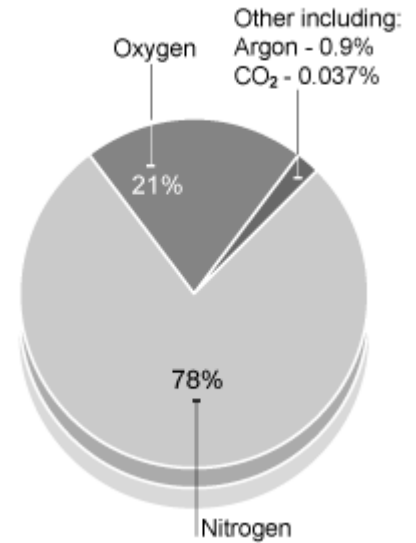
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On earth, two elements, nitrogen ( $N_2$ ) and oxygen ( $O_2$ ), make up almost 99% of the volume of clean, dry air. Most of the remaining 1% is accounted for by the inert gaseous element, argon (Ar). Argon and the tiny percentage of remaining gases are referred to as trace gases. A well-known trace gas is carbon dioxide ( $CO_2$ ).

Nitrogen is an inactive gas and serves a valuable role in diluting the oxygen in our atmosphere.



**Homework Question:**  
Graph from the week, complete the pie chart showing the make-up of Earth's atmosphere.

**Thought Question**

**Analyze:** What would happen if our atmosphere consisted of pure oxygen?

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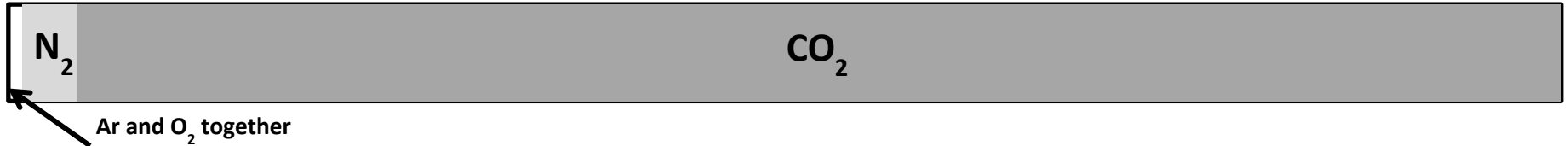
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Every planet in our solar system has a unique atmosphere. For example, Mercury has almost no atmosphere due to its weak gravity and close distance to the sun. Venus is referred to as Earth's sister planet because it has similar gravity and is also about the same size. However, does it have a similar atmosphere? There is buzz in the news about planning a manned trip to Mars. What type of atmosphere would astronauts find on Mars? Use the bars below and a ruler to calculate the percentage of components in the atmosphere of Venus and Mars. (Example calculation in your baskets)

**VENUS:**



**MARS:**



**Thought Question**

**Calculate:** The percentage of gasses on Venus and Mars

	Venus (Estimated Percentage %)	Mars (Estimated Percentage %)
Carbon Dioxide ( $CO_2$ )		
Nitrogen ( $N_2$ )		
Argon and Oxygen (Ar and $O_2$ )		

**\*Finished Early?** Take a look at the bonus reading on "Revealed: How Mars Lost Its Atmosphere" in your group basket.