



Earth and Space Science

Workbook

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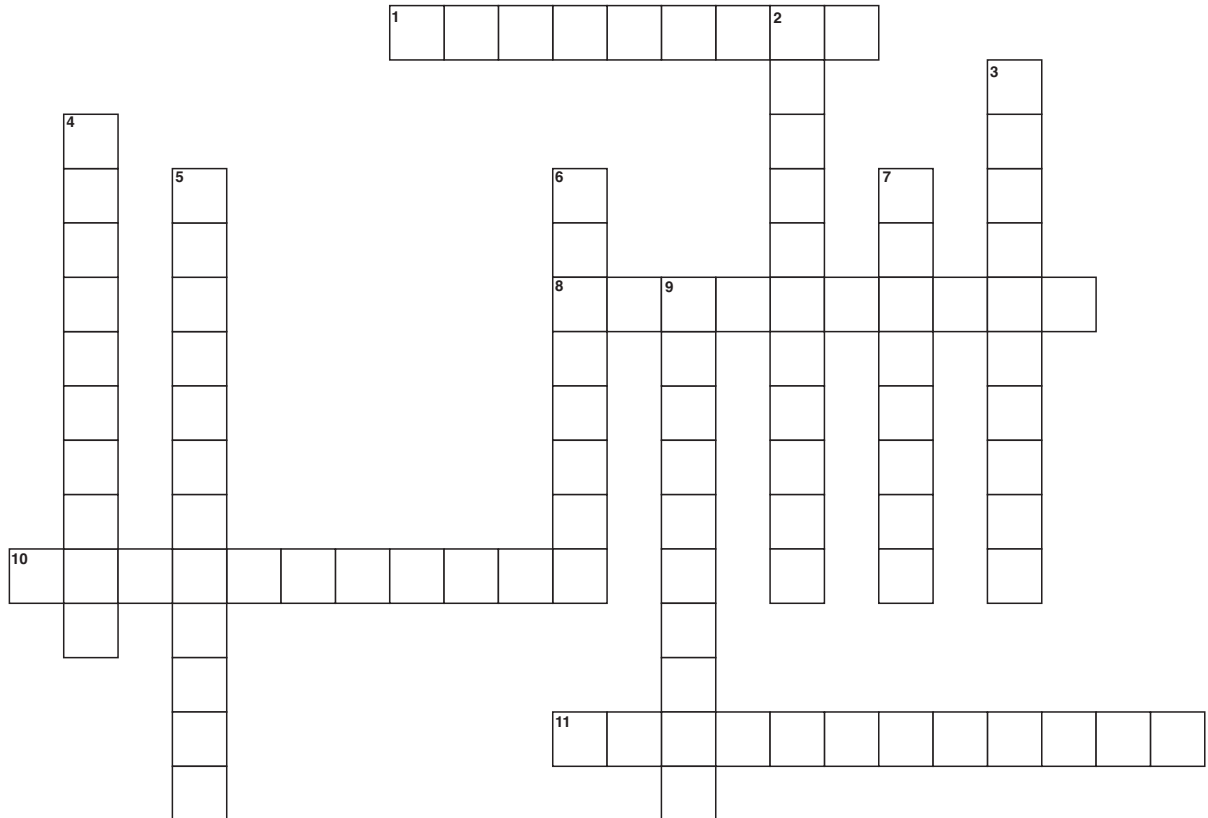
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UNIT 2 • ACTIVITY 21

Atmosphere Puzzle

Use the clues below to complete the crossword puzzle.



Across

1. This is the boundary between the mesosphere and the thermosphere.
8. This is the boundary between the troposphere and the stratosphere.
10. This is the lowest layer of the atmosphere, where weather occurs.
11. This is the region of the atmosphere above the mesosphere and below outer space.

Down

2. The boundary between the stratosphere and the mesosphere is _____.
3. A region in the upper stratosphere and lower mesosphere where radio transmission can be affected by solar radiation is the _____.
4. This is the region of the atmosphere above the stratosphere and below the thermosphere.
5. This is the region of the atmosphere above the troposphere and below the mesosphere.
6. This is the distance from sea level of a place to the atmosphere or to a mountaintop.
7. The lowest part of the atmosphere is _____ (2 words).
9. This region in the upper troposphere and lower stratosphere is where ozone collects as a result of solar radiation. This layer scatters ultraviolet radiation and keeps Earth safe for life (2 words).



**UNIT 2 • ACTIVITY 22****Ozone and Greenhouse Gases**

Ozone is a variable gas in Earth's atmosphere. This means the amount of it can change from one location to the next. The ozone layer is the zone in the atmosphere at the top of the stratosphere in which ozone can be found. It is located 10 to 50 kilometers above Earth's surface. Ozone absorbs the harmful ultraviolet (UV) radiation from the Sun that bombards Earth each day. All life depends on the ozone's protection.

Greenhouse gases include carbon dioxide, methane, and water vapor. When these gases accumulate in the atmosphere, they trap the heat energy from the Sun that radiates back from Earth. The heat energy is unable to escape from Earth's atmosphere. The result is a hotter planet.

Modern-day pollution has been affecting the levels of greenhouse and ozone gases. The governments of many nations, including the United States, have begun to measure, monitor, and study these gases. Two agreements have been made that will affect the health of the atmosphere: the Montreal Protocol and the Kyoto Protocol. The Montreal Protocol states that chemicals that deplete the ozone layer are to be phased out by 2005. More than 100 nations participated in this agreement. The Kyoto Protocol was an agreement between more than 160 nations to reduce greenhouse gases that can affect global warming.

Answer the questions below on the lines provided.

1. Why is the ozone layer important?

2. How do greenhouse gases affect Earth?

3. Do you think the nations of the world are doing enough to control gases that pollute?

**UNIT 2 • ACTIVITY 23****Can We “See” Air Pressure?**

This experiment will help you find out how temperature changes air pressure.

Materials

- Empty plastic drink container with a screw-on cap
- Pan of very hot water
- Refrigerator or freezer

Safety Consideration

Be careful when using hot water.

Procedure

1. Take the cap off the bottle, and squeeze the sides in. Replace the cap tightly.
2. Think about what might happen if the air in the bottle heats up. Write your prediction on the line.

3. Submerge the bottle in the hot water.
4. What happened? Record what you observed. Explain why you think this happened.

5. Place the bottle in the refrigerator or freezer. Predict what you think might happen to the bottle. Write your prediction on the line.

6. After five minutes, take out the bottle and record what you observe. Explain why you think the bottle changed again.

7. Were your predictions correct? Explain what you learned from this experiment. How do you think this applies to Earth’s atmosphere?

