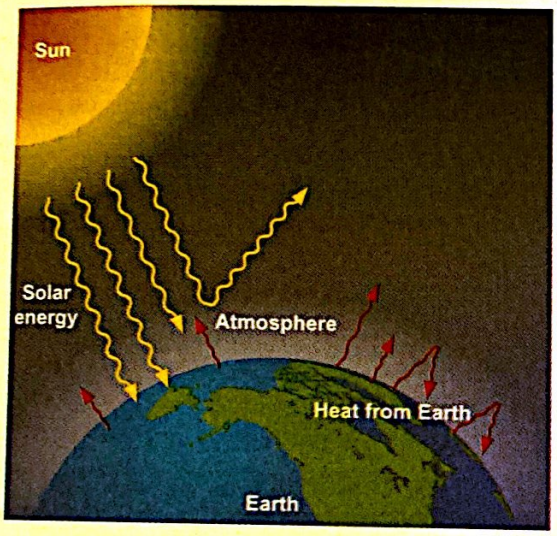
GREENHOUSE GASES

Earth's average temperature is 14 degrees Celsius, or 57 degrees Fahrenheit. Without the greenhouse gases in Earth's atmosphere, the planet's temperature would be much lower—too cold for the survival of people and most other living organisms. The greenhouse gases—such as carbon dioxide, methane, and nitrous oxide—make up less than 1 percent of Earth's atmosphere. Yet, as the diagram suggests, they are important in warming Earth's surface and atmosphere. After Earth absorbs solar energy, it emits infrared radiation, some of which is kept within the atmosphere by greenhouse gases.



2. Which statement expresses what happens to the energy from the sun?

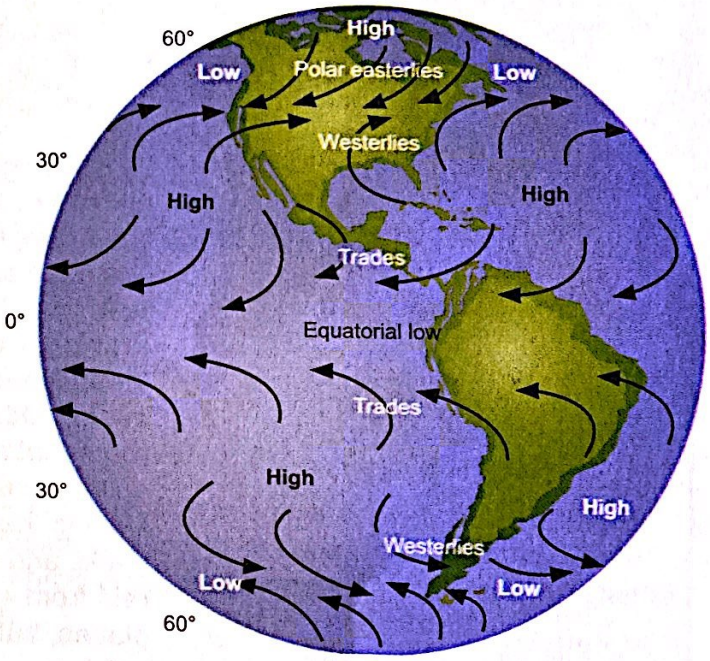
A. All of it reaches Earth and is absorbed by Earth's surface.
B. All of it reaches Earth and is reflected into the atmosphere.
C. Some is absorbed by Earth's surface, and some is reflected by Earth.
D. Some is absorbed by Earth's surface, and some is reflected by the atmosphere.

3. Which parts of the diagram express visually the effect of greenhouse gases?

A. the arrows from Earth that bend back toward Earth
B. the arrows from the sun to Earth's surface
C. the arrows from the sun that bend at Earth's atmosphere
D. the arrows pointing away from Earth

PRESSURE AND WIND ZONES

Because of its diverse natural environments, Earth's surface absorbs the heat of the sun unevenly. For example, a dark tropical forest absorbs a different amount of solar energy than a white snowfield near the North Pole. Unequal heating causes unequal distribution of air pressure from one place on Earth's surface to another. This condition helps cause wind, which is the movement of air from areas of higher air pressure to areas of lower air pressure. Unequal heating produces huge belts of high and low pressure across Earth. These pressure belts are important in determining global wind zones.



4. To express information about the wind belt that covers most of the United States, you would discuss

A. the polar easterlies.
B. the westerlies.
C. the trades (or trade winds).
D. the equatorial low.

5. Which statement expresses the relationship between high and low pressure areas as conveyed by the map?

A. Air moves toward Earth's equatorial low.
B. Air moves from areas of high pressure to areas of lower pressure.
C. Air moves in toward high pressure.
D. Air moves from areas of low pressure to areas of higher pressure.

The air pressure of Earth's atmosphere varies from place to place. This uneven distribution of air pressure causes wind and weather patterns. Storms are associated with lower air pressure, whereas fair weather is associated with higher air pressure. Trade winds occur in a wind zone that circles Earth from about 30 degrees latitude North to about 30 degrees latitude South. In a band around Earth's middle, trade winds from the north blowing southeasterly meet trade winds from the south blowing northeasterly. This band of low pressure is the Intertropical Convergence Zone (ITCZ).

11. Based on the information and the concept of wind, which statement describes the trade winds that meet in the ITCZ?

A. They originate in areas of lower air pressure.
B. They originate in areas of higher air pressure.
C. They move to areas of higher pressure.
D. They rarely produce storms.

DIRECTIONS: Read the passage and question, and choose the **best** answer.

The National Weather Service (NWS) has created a system of watches and warnings for natural hazards such as tornadoes, hurricanes, flash floods, and blizzards. Tornadoes are a frequent natural hazard in parts of the Midwest and the Great Plains during spring and summer. The NWS issues a tornado watch when atmospheric conditions are right for the development of tornadoes, with advice to stay alert for further information. The NWS issues a tornado warning when a tornado has been seen on the ground or has been spotted on radar. A warning is the signal that it is time to look for shelter from the storm.

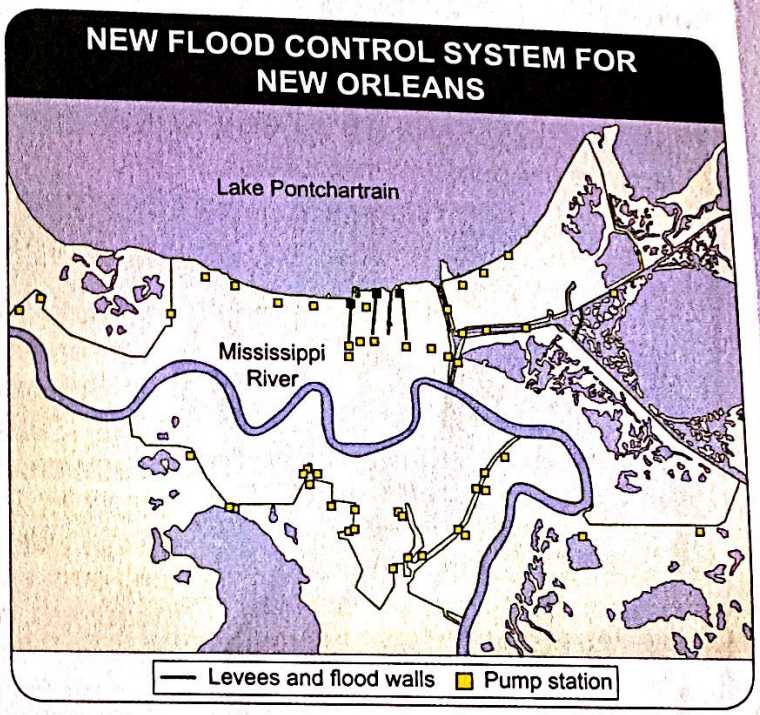
22. How do watches and warnings help solve the problem of dealing with strong and dangerous storms, such as tornadoes?

A. They help prevent dangerous storms.
B. They allow people to take cover so that there is less danger of being hurt.
C. They allow meteorologists to study severe storms more easily.
D. They help people understand how severe storms such as tornadoes form.

AFTER KATRINA

Hurricane Katrina struck New Orleans in August 2005, destroying thousands of homes and leaving most of the city under water. A storm surge pushed water up interior canals. It caused flood walls to fail and allowed water to pour into the city's lowest neighborhoods, which sit in a basin as much as 17 feet below sea level.

Each year, 30 square kilometers (12 square miles) of wetlands between New Orleans and the Gulf of Mexico are lost due to subsidence. These wetlands absorb some of the force of storm surges from the Gulf, protecting New Orleans. As they disappear, the city is more vulnerable to storms. A new system of flood protection was erected in and around New Orleans in the years after Katrina. It is meant to protect the city from other storms like Katrina. Such storms have been rare in the past but could be more frequent in the future due to climate change and the warming of tropical waters where they develop.



2. In the aftermath of Katrina, many owners of destroyed businesses have had to decide whether to rebuild in New Orleans or go elsewhere. Consider the information in the passage and map. Then explain why rebuilding in New Orleans might present problems for businesses, and evaluate whether the solution engineers have devised will be effective.