

## THE SUN POWERS THE EARTH'S CLIMATE SYSTEM (pg. 325-329)

Earth has a global \_\_\_\_\_, which includes \_\_\_\_\_, liquid \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ things. The climate system is powered by the \_\_\_\_\_. The interactions between these components and the sun produce \_\_\_\_\_ zones.

### THE BALANCE OF ENERGY ON EARTH

Almost all energy on Earth comes from the \_\_\_\_\_. The sun emits different types of \_\_\_\_\_, including \_\_\_\_\_ radiation (invisible short wavelength, \_\_\_\_\_-energy radiation), visible light, and \_\_\_\_\_ radiation (invisible long wavelength, \_\_\_\_\_-energy radiation).

### EARTH ABSORBS ENERGY FROM THE SUN

When radiation contacts a particle of matter, one of \_\_\_\_\_ things happens.

1. The radiation may be \_\_\_\_\_ causing the particle to \_\_\_\_\_ energy.
2. The radiation may be \_\_\_\_\_ through the particle.
3. The radiation may be \_\_\_\_\_ off the particle.

About \_\_\_\_\_% of the energy from the sun is reflected back to space by \_\_\_\_\_, particles in the \_\_\_\_\_, and Earth's \_\_\_\_\_. The remaining \_\_\_\_\_% is absorbed by Earth's \_\_\_\_\_, \_\_\_\_\_, and certain \_\_\_\_\_ in the atmosphere. This accounts for \_\_\_\_\_% of the incoming radiation from the Sun.

### FIGURE 3, PG. 326

\* incoming solar energy = \_\_\_\_\_%

\* reflected by atmosphere = \_\_\_\_\_%

\* reflected by clouds = \_\_\_\_\_%

\* absorbed by atmosphere and clouds = \_\_\_\_\_%

\* absorbed by land and oceans = \_\_\_\_\_%

Plants trap a small proportion of the energy (<\_\_\_\_%) and use it to power the process of \_\_\_\_\_. As Earth's surface temperature increases, it heats the \_\_\_\_\_ above.

### HOW DOES EARTH MAINTAIN A BALANCE?

Earth is constantly \_\_\_\_\_ energy from the Sun because the Sun has no "off" switch or thermostat. So why does Earth's average temperature remain relatively \_\_\_\_\_?

### EARTH'S SURFACE EMITS ENERGY

Energy can be \_\_\_\_\_ from one form to another. As energy is absorbed, Earth's surface gains \_\_\_\_\_ energy and its \_\_\_\_\_ rises. Earth's warm surface then emits mostly lower-energy \_\_\_\_\_ radiation back out. Earth's surface both \_\_\_\_\_ energy and \_\_\_\_\_ energy. The amount of energy radiated by Earth's system is \_\_\_\_\_ to the amount of energy Earth's system absorbs from the Sun. As a result, Earth's \_\_\_\_\_ temperature stays fairly constant.

### LATITUDE AND CLIMATE ZONES

The climate is warmer at \_\_\_\_\_ latitudes and colder at \_\_\_\_\_ latitudes near the North and South Poles. Latitude is a measure of distance from the \_\_\_\_\_. Near the equator, the Sun shines directly \_\_\_\_\_. There, the energy from the Sun is spread over a \_\_\_\_\_ area and feels very strong. Closer to the North and South Poles, the Sun is not directly overhead. As a result, the Sun's energy is spread over a \_\_\_\_\_ area and feels weaker (see Fig. 7, pg. 329).

*Explain the other reason why climate changes with latitude (pg. 329)*