



LIFE·PAC<sup>®</sup>

Science



Alpha Omega Publications<sup>®</sup>

# SCIENCE 407

## WEATHER

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<b>Author:</b>	<b>Merton B. Osborn, Ed.D.</b>
Editor-in-Chief:	Richard W. Wheeler, M.A.Ed.
Editor:	Janet Monseu
Consulting Editor:	Harold Wengert, Ed.D.
Revision Editor:	Alan Christopherson, M.S.



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# WEATHER

On the second day of Creation, God separated the earth and sky. God made the atmosphere. All life on earth depends upon this ocean of air. Without air, people, animals, and plants would all die within a very short time.

Changes in the air around the earth, such as changes in the temperature or in the pressure, cause different kinds of weather. In this LIFE PAC® you will learn about the causes and forces of the weather. You will also find out something about weather prediction, both by observation and by the use of special instruments.

## OBJECTIVES

**Read these objectives.** The objectives tell you what you should be able to do when you have successfully completed this LIFE PAC.

When you have finished this LIFE PAC, you should be able to:

1. Tell three reasons why weather conditions are different.
2. Tell about the forces of weather.
3. Relate the importance of weather in God's plan.
4. Describe the different types of storms, their dangers and their benefits.
5. Explain the relationship between weather and geography.
6. Identify instruments used in predicting weather.

## VOCABULARY

**Study these new words.** Learning the meanings of these words is a good study habit and will improve your understanding of this LIFE PAC.

**altitude** (al' tu tüd). Height above the earth's surface.

**anemometer** (an u mom' u tur). An instrument for measuring wind force and speed.

**aneroid** (an' u roid). Without liquid.

**atmosphere** (at'mu sfir). Air that surrounds the earth.

**barometer** (bu rom' u tur). An instrument for measuring the pressure of the atmosphere.

**blizzard** (bliz' urd). A blinding snowstorm with strong winds and cold temperatures.

**Celsius** (sel' sē us). A thermometer scale of 100 degrees (C).

**centigrade** (sen' tu grād). A temperature scale divided into 100 degrees.

**cycle** (sī' kul). A period of time or action that repeats itself.

**erosion** (i rō' zhun). Being worn away little by little.

**evaporate** (i vap' u rāt). To change from a liquid to a vapor.

**exosphere** (ek' su sfir). The part of the atmosphere that begins to blend into space.

**expand** (ek spand'). To spread out.

**extend** (ek stend'). To stretch out.

**Fahrenheit** (far' un hīt). A temperature scale for a thermometer (F).

**fertilizer** (fēr' tu lī zur). Manure or chemical put on soil to make it richer for growing crops.

**forecast** (fôr' kast). To tell what is coming.

**funnel** (fun' ul). A small tube with a wide cone-shaped mouth.

**gauge** (gāj). A measure.

**geographic** (jē u graf' ik). Having to do with the earth's geography.

**hurricane** (hēr' u kān). A storm with strong winds that forms over the ocean.

**ionosphere** (ī on' u sfir). A layer of air above the earth.

**irrigate** (ir' u gāt). To supply land with water.

**layer** (lā' ur). One thickness or fold.

**mercury** (mēr' kyur ē). A heavy, silver-white metal that is liquid at ordinary temperatures.

**miracle** (mir' u kul). Something only God can do.

**ozone** (ō' zōn). A gas present in the air.

**predict** (pri dikt'). To tell beforehand.

**pressure** (presh' ur). Weight or force upon something.

**pressurized suit** (presh' u rīzd sūt). An airtight suit that can be blown up to keep normal pressure.

**radiation** (rā de ā' shun). Giving out rays of light, heat, or electricity.

**satellite** (sat' u līt). An object in space that moves around the earth or any other heavenly body.

**stratosphere** (strat' u sfir). The upper part of the atmosphere.  
**thermometer** (thur mom' u tur). An instrument for measuring temperature.  
**tornado** (tôh nâ' dō). A very damaging whirlwind.  
**transparent** (tran spâr unt). Easily seen through.  
**troposphere** (trō' pu sfir). The layer of the atmosphere nearest the earth.  
**ultraviolet** (ul tru vī' u lit). Unseen rays from the sun.  
**vane** (vān). An object used to tell the direction of the wind.  
**vapor** (vā' pur). Moisture in the air.  
**weathering** (weTH' ur ing). Action of air, water, frost, and wind on rocks and other things of the earth.

**Note:** All vocabulary words in this LIFE PAC appear in **boldface** print the first time they are used. If you are unsure of the meaning when you are reading, study the definitions given.

**Pronunciation Key:** hat, āge, cāre, fār; let, ēqual, tērm; it, īce; hot, ōpen, ôrder; oil; out; cup, pūt, rüle; child; long; thin; /Th/ for then; /zh/ for measure; /u/ represents /a/ in about, /e/ in taken, /o/ in lemon, and /u/ in circus.

## I. CAUSES OF WEATHER

Many times you can know what the weather is like outdoors or by either stepping outside or by looking through your window. You will know whether it is windy or calm, clear or cloudy, raining or snowing. Why is the weather the way it is? What are the causes of different weather conditions? What are the effects of weather upon the earth on which we live? How can the weatherman tell you what may happen to the weather tomorrow? In this section of your LIFE PAC, you will discover answers to these questions.

**Review these objectives.** When you have completed this section, you should be able to:

1. Tell three reasons why weather conditions are different.
3. Relate the importance of weather in God's plan.

### Restudy these words.

altitude	extend	radiation
atmosphere	Fahrenheit	stratosphere
Celsius	ionosphere	transparent
cycle	layer	troposphere
evaporate	ozone	ultraviolet
exosphere	pressure	vapor
expand	pressurized suit	

# ATMOSPHERE

Do you know that when you came to school this morning, you were walking through an ocean of air? You live at the bottom of a huge ocean of air called the **atmosphere**.

You cannot see the air. Scientists do not know exactly how far into space the air **extends**. Scientists do know that the airplanes that take off and land every day at busy airports depend upon air. Clouds float on air. Birds fly through it. All living things, including man, animals, and plants, have to have air in order to live.

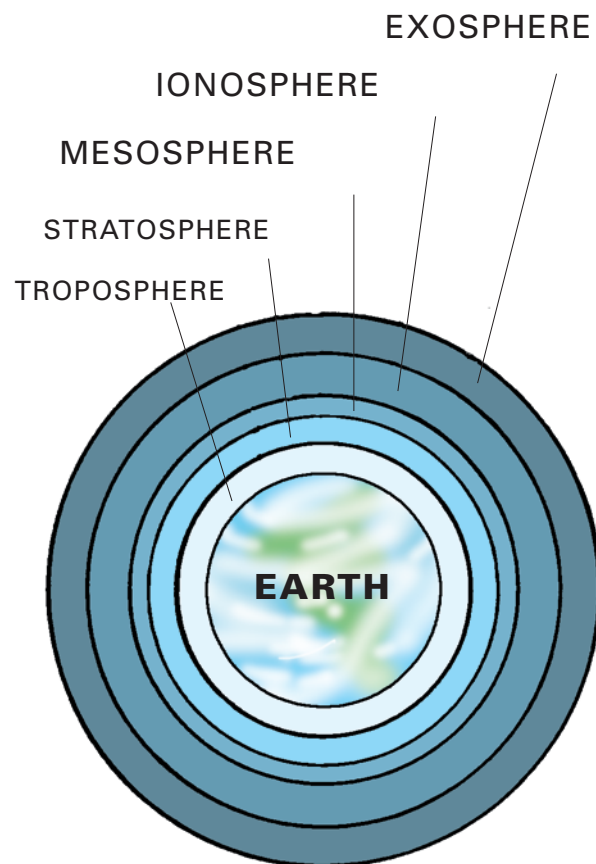
You feel air moving when you go outdoors. You see the result of air when you look at the swaying treetops or at rustling corn. You feel the air blowing across your face. Sometimes you see the damage it can cause to buildings and trees that happen to be in its path when it blows with force.

Although scientists do not know the exact limits of our atmosphere, they know that air is about one thousand miles (1,600 kilometers) in all directions around our earth. By using weather balloons, planes, and rockets, weathermen have studied the atmosphere. They have found out many exciting facts about it, and they are learning more every year.

Scientists have named the levels of the atmosphere. Air nearest the earth is called the **troposphere**. The word *troposphere* comes from a Greek word that means to *turn* and *mix*. In this **layer** the mixing and turning of the air takes place. The troposphere contains almost all the

air and most of the water **vapor** in the atmosphere. The great wind belts, the clouds, and the weather are all part of the troposphere.

The lower part of the troposphere, which is the earth's weather zone, extends only about ten miles (about 16 kilometers) in all directions from the earth. The air not only moves across the land, but it moves up and down, causing wind belts.



**Layers of Atmosphere**

As we travel outward from our earth, the next layer of atmosphere is the **stratosphere**. The stratosphere reaches a height of about thirty miles (about 48 kilometers) above the earth. Very few clouds are found in the