

From The Series
Geography Basics

Teacher's Guide Written by
Barri Golbus

Produced by
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Table of Contents

	Page
Program Overview	3
Viewer Objectives	4
Suggested Lesson Plan	5
Description of Blackline Masters	6
Answer Key	7
Transcript of the Video	11
Web Resources	21

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CLIMATE, WATER & LIVING PATTERNS:

Geography Basics

Running Time: 24 minutes

PROGRAM OVERVIEW

Intended Audience and Uses

Climate, Water & Living Patterns, the second program in the *Geography Basics* series, is designed for social studies students in grades 4-8. The concepts in this video are found in virtually all leading geography texts at the upper elementary and jr. high-middle school levels. Moreover, the material presented in *Climate, Water & Living Patterns* makes up part of the NCSS (National Council for the Social Studies) recommendations for the target grade levels.

Program Synopsis

The program begins with a survey of various climates around the world. The difference between “weather” and “climate” is explained. Weather, the narrator says, is what happens on a short-term basis; climate is weather averaged over a long time. The program then identifies the world’s

six principal climate regions – dry, tropical, temperate, continental, polar and highland – and notes the major characteristics of each. Next, the five factors that affect climate – altitude, latitude, earth surface features, large bodies of water and wind patterns – are discussed. The third part of the program covers climate changes. A large part of the discussion focuses on *El Niño* and *La Niña* ocean stream patterns and their worldwide climate consequences. Other factors mentioned include volcanoes, carbon dioxide emissions and solar activity. The next section of the program shows how climate patterns affect diet, shelter, clothing and recreation. The final part of the program discusses the importance of water – in agriculture, transportation, power generation (hydroelectricity) and in other human activities. The water cycle is explained in detail.

VIEWER OBJECTIVES

After viewing this video and participating in the suggested activities, viewers should be able to do the following:

1. Name the six major climate regions of the world and tell the key characteristics of each one.
2. Explain how five key factors affect climate.
3. Tell how climate patterns affect human living patterns.
4. Discuss the importance of water to all living things and tell how the water cycle works.

The producers encourage you to make adaptations and changes to the following lesson plan whenever you feel it will enhance your students' learning experiences. Only by tailoring the material to your unique classroom situation will you be able to maximize the educational experience afforded by these materials.

SUGGESTED LESSON PLAN

Introduce the Program

Well in advance, have your students take the **PRE-TEST** which can be used to evaluate their knowledge of the material to help you plan your lessons. After assessing your class' level of understanding, begin a discussion of "my favorite weather." Is it hot and sunny? Cool and crisp? Be sure to discuss how weather affects what we do. For example, it's difficult to have a picnic in a blizzard. Discuss climate. What's the difference between weather and climate. Ask the class to characterize their community's climate. Can climates change? If so, how? Then turn the discussion toward the importance of water. Can we live without water? Can any living thing live without it? Tell the class they will see a program on climates and water that will answer these, and many other questions about climate and water and how they affect people.

Pre-Viewing Activities

Either pass out or make an overhead transparency of **LEARNING GOALS**. Discuss each item, making certain the class understands the concepts that will be presented in the video. Next, hand out the **VOCABULARY LIST** and have the class complete this exercise either as individual desk work, as a class activity or in small groups. If your students have access to computers, they can look up the words at www.onelook.com or the Encarta online dictionary, <http://dictionary.msn.com/>, which has audio files that give word pronunciations. Scientific and geographic terms can be found in the specialty dictionaries at www.yourDictionary.com. Finally, pass out the **VIEWER'S CONCEPT GUIDE**. Have the students read the questions, and tell them that they will be expected to fill in the blanks

after the video has been viewed. At three places during the presentation, a stop point is designated by the “☐” symbol. At each stop point, teachers are encouraged to hand out a recommended blackline master that enhances an understanding of key concepts presented in the previous sequence.

View the Video

Total viewing time is approximately 24 minutes. Teachers are encouraged to pass out the following worksheets at each stop point: *CLIMATES* after the first stop point; *CLIMATE CHANGES* after the second; and *THE WATER CYCLE* after the third. *Note: It is suggested that viewers pause the video on the scene that shows the different climate areas of the world when doing the CLIMATES worksheet.* The work sheets may be done as individual desk work, or as a small group or class activity. It is also suggested that the entire presentation be replayed a second time, as a review, before giving the *POST TEST*.

Post-Viewing Activities

If you have handed out the three worksheets mentioned above, and not yet reviewed them, please do so now.

DESCRIPTION OF BLACKLINE MASTERS

PRE-TEST – An assessment tool that helps you determine the level of your classroom presentation.

LEARNING GOALS – Delineates the concepts students are expected to learn. Also lists behavioral objectives.

VOCABULARY LIST – Presents terms that your students will need to know to fully understand the video.

VIEWER’S CONCEPT GUIDE – Focuses on the main information in the program to help your students learn all major concepts.

CLIMATES – A review activity that helps students remember climate areas.

CLIMATE CHANGES – Provides a review of *El Niño* and *La Niña* phenomena and the other factors that impact climate.

THE WATER CYCLE – A review activity that helps students better understand the water cycle.

POST TEST – An assessment tool that allows you to determine the level of comprehension and retention of key material.

ANSWER KEY

PRE-TEST – 1. F ♦♦♦ 2. T ♦♦♦ 3. F ♦♦♦ 4. F ♦♦♦ 5. F ♦♦♦
6. T ♦♦♦ 7. F ♦♦♦ 8. T ♦♦♦ 9. T ♦♦♦ 10. F ♦♦♦ 11. T ♦♦♦ 12. T

VOCABULARY LIST – *Altitude*: height above sea level, or some other level on the earth’s surface ♦♦♦ *Atmosphere*: the air that surrounds the earth ♦♦♦ *Climate*: the kind of weather a place has over many years’ time ♦♦♦ *Climatologist*: scientist who studies climates; *continental climate*: climate that normally has four seasons ♦♦♦ *Diversions*: pastimes or amusements ♦♦♦ *Drought*: long period without rainfall ♦♦♦ *Edible*: can be eaten ♦♦♦ *El Niño*: a period during which warm waters of the South Pacific Ocean move eastward ♦♦♦ *Equator*: the dividing line between the northern and southern hemispheres ♦♦♦ *Evaporate*: turn liquid to vapor ♦♦♦ *Folklore*: the legends and beliefs of a people ♦♦♦ *Global warming*: slowly rising temperatures of the earth believed to be caused by a buildup of atmospheric carbon dioxide ♦♦♦ *Hemisphere*: half of the earth ♦♦♦ *Irrigation*: watering crops ♦♦♦ *La Niña*: a period during which cold water surfaces in the Pacific Ocean ♦♦♦ *Laden*: loaded ♦♦♦ *Latitude*: east-west lines across the globe ♦♦♦ *Moisture*: slight wetness ♦♦♦ *Overcast*: sky completely covered with clouds, usually low clouds ♦♦♦ *Porous*: having tiny holes through which water, gas or light can pass ♦♦♦ *Precipitation*: water as it falls to earth as rain, snow, sleet, etc. ♦♦♦ *Radiant energy*: heat and light ♦♦♦ *Radioactive*: giving off radiant energy in the form of alpha, beta and gamma rays ♦♦♦ *Rain shadow*: a dry area downwind from a mountain range ♦♦♦ *Replenish*: to fill again ♦♦♦ *River basin*: land drained by a river and its tributaries ♦♦♦ *Scrubby*: low, stunted, small ♦♦♦ *Steppe*: a vast, treeless plain; ♦♦♦ *Sulfuric*: containing sulfur ♦♦♦ *Temperate climate*: region in which summers are warm, and the rest of the year is mild with long

periods of rainfall ♦♦♦ **Topography**: the surface features of a region ♦♦♦ **Tropical climate**: a region where it is hot all year ♦♦♦ **Water cycle**: the process by which water evaporates to the atmosphere, then returns to earth as rain, snow, etc.

VIEWER'S CONCEPT GUIDE

1. tropical, dry, continental, polar, temperate, highland
2. altitude, latitude, oceans and other large bodies of water, earth winds, topography
3. dry lands and dry air
4. the mountain
5. warmer
6. colder
7. droughts, grassfires, floods
8. global warming
9. food eaten, how shelters are built, clothing that is worn, recreational activities
10. it is not evenly distributed
11. one

CLIMATES

1. temperate
2. highland
3. dry
4. dry
5. dry

6. highland
7. temperate
8. dry
9. tropical
10. tropical
11. temperate
12. continental
13. polar
14. polar
15. polar
16. continental
17. temperate
18. temperate
19. highland
20. tropical
21. temperate
22. dry
23. tropical
24. dry
25. temperate
26. polar
27. temperate
28. dry
29. dry
30. temperate
31. temperate

- 32. tropical
- 33. tropical
- 34. temperate
- 35. polar

Tropical – hot year-round with frequent rains

Dry – very little precipitation, temperatures swing widely between daylight and night-time hours

Temperate – summers often warm, rest of the year, cool and mild, with long periods of rainfall

Continental – summers warm and humid, winters often cold and snowy, precipitation distributed somewhat evenly throughout the year

Polar – short chilly, often rainy summers and very long, cold, blustery winters

Highland – temperatures vary according to elevation

CLIMATE CHANGES

The stream should be flattened to show the *El Niño* pattern. Changes

include surface waters becoming warmer than normal and moving to the east; droughts and range fires in western Pacific regions; floods in Peru and mild winters in the mid-western United States.

The stream should sweep upward to show the *La Niña* pattern.

Changes include surface waters turning cold, warmer waters pushed westward, heavy rains in western Pacific regions.

The other factors that cause climate changes: volcanic eruptions whose sulfuric particles block sunlight and lower temperatures; activity on the sun that increase temperatures on earth; increased amounts of atmospheric carbon dioxide that many believe is responsible for global warming.

THE WATER CYCLE

1. Water evaporates from oceans, rivers and plants and enters the atmosphere.

2. Clouds form and are blown to different locales.

3. Clouds drop their moisture in the form of rain, snow, etc.

4. Water moves from land at high elevations down to lakes and rivers.

5. Water flows from rivers to oceans, etc. where it is evaporated back into the atmosphere.

Five ways water is used:

1. Replenish our body's supply of water

2. Irrigation

3. Industry

4. Cooling radioactive material in atomic energy facilities

5. Producing hydroelectricity (also transportation)

POST TEST

Part I

1. F ♦♦♦
2. T ♦♦♦
3. T ♦♦♦
4. F ♦♦♦
5. F ♦♦♦
6. F ♦♦♦
7. T ♦♦♦
8. F ♦♦♦
9. T ♦♦♦
10. T

Part II

1. D ♦♦♦
2. E ♦♦♦
3. A ♦♦♦
4. B ♦♦♦
5. C

Part III

1. Highland
2. Dry
3. Tropical
4. Temperate
5. Continental
6. Highland
7. Dry
8. Polar
9. Tropical
10. Continental

Part IV

1. altitude, latitude, winds, topography, oceans and other large bodies of water

2. replenish body's supply of water, irrigation, industry, cooling radioactive material, producing hydroelectricity, transportation

3. the equator

4. carbon dioxide

5. it is unevenly distributed

Part V

1. C ♦♦♦
2. A ♦♦♦
3. B ♦♦♦
4. A ♦♦♦
5. C ♦♦♦
6. D

TRANSCRIPT OF THE VIDEO

The rains come, almost like clock work.

For this is St. Petersburg, Russia - a place where, on average, it rains almost every third day.

For months on end, it is raw, damp and cold there - umbrella and coat weather.

The climate of this northwestern Russian city is clearly unlike the desert lands of Jordan with their bone dry sands baked under a brutally hot sun.

The sky remains cloudless for months at a time in this foreboding land.

Of course, there are days in many places throughout the world when it is warm and dry; but on other days, cool and overcast; and still other days, cold and snowy.

In the short term, rain or snow, heat or cold is a place's daily or weekly "weather."

A place's "climate," on the other hand, is its weather averaged over a long time - decades, hundreds, even thousands of years.

Climatologists – people who study climates with weather balloons, specially equipped airplanes, satellites and other devices – often divide the world into six principal climate regions: dry, tropical, temperate, continental, polar and highland.

In tropical climates, it's hot year-'round, with frequent rains – although in some tropical regions there are periods with no rainfall.

Many dry climate regions have very little precipitation – and little or no plant life. Deserts are found in dry climates, as are steppe areas which often border deserts.

Steppe regions have slightly more rain, and are often covered with scrubby plant growth.

In both steppe and desert areas temperatures swing widely between daylight and night-time hours.

Next, the temperate climate, where summers are often warm and the rest of the year cool and mild, with long periods of rainfall.

Summers are also warm in continental climates. They're humid, too.

Winters in continental climate areas are often cold and snowy. Precipitation – snow in the cold months, rain when it's warm – is distributed somewhat evenly throughout the year.

Polar areas have short, chilly and often rainy summers and very long, cold, blustery winters.

Finally, there are highland climates, whose temperatures vary according to elevation. Specifically, the higher one goes, the cooler it becomes because oxygen, which holds heat, becomes increasingly thinner at higher altitudes.

In fact, altitude is one of five major factors that affect climate.

If you walked up a mountain pathway, for example, you would find that the temperature would drop 3.5 degrees Fahrenheit for every 1,000 feet you climbed (or 6.5 degrees Celsius for every 1,000 meters).

Another of the five factors that affect climate is latitude.

Because the sun's radiant energy shines directly on areas nearest the equator, that is where the warmest areas of the earth are found.

Farther to the north, and farther south, the angle of sunlight becomes smaller, so there's less heat from the sun at those locations.

At the north pole and south pole, the angle of sunlight is so small that very little heat finds its way to the earth's surface in those places.

Latitude takes on added importance as the earth makes its

annual journey around the sun. That's because the earth tilts roughly 23 ½ degrees on its axis.

So when it's at this position, in July, it's summer in the northern hemisphere because the sun's light and heat – due to the earth's tilt – is aimed more directly there.

At the same time, it's winter in the southern hemisphere, where the angle of the sun's energy is much smaller.

Half a year later, in January, when the earth's position is here, it's just the opposite. Now, the sun's light and heat are aimed more directly at the southern hemisphere. So it's summer there, and winter in the northern hemisphere.

Now, on to the third of the five factors that affect climate: the earth's topography – that is, its surface features.

Mountain ranges are an example of a topographical feature that can play a major role in a climate's precipitation levels.

As humid air moves in from an ocean and then sweeps upward across the mountain slopes, the air cools and the moisture swept off the water begins to form a cloud.

As the tiny water droplets in the cloud come together, they become heavier and then fall to the ground.

As the air skims down the other side of the mountain, it heats up and the cloud vanishes. The side of mountains facing away from oceans are often dry.

In addition, a so-called "rain shadow" may stretch more than a hundred miles downwind from a mountain range. "Rain shadow" areas are known for their dry lands and dry air.

Oceans and large lakes – the fourth of the five factors that affect climate – often moderate what otherwise would be extreme weather conditions.

An example occurs in San Francisco, California, on the shores of the Pacific Ocean.

San Francisco and St. Louis, Missouri, a city some 2,000 miles (or 3,300 kilometers) to the east, lie at about the same latitude and so get about the same amount of solar energy each year.

Yet San Francisco's climate is much less extreme than that of St. Louis. Summers are mild and winters are cool there, while in St. Louis, summers can be blistering hot and winters very cold.

The difference is the moderating winds that blow off the surface of the Pacific Ocean. They act as a kind of giant air conditioning system.

Or take the case of the British Isles, which, for the most part, have mild summers and cool and rainy winters.

The northern tip of the isles is located on a latitude that runs north of Moscow, Russia, a city that has cold, snowy winters and very short, cool summers.

The contrast is caused by the warm ocean waters that flow by the isles – waters that originate off Africa's west coast, near the equator.

Now on to the earth's winds, the last of the five factors we'll discuss that affect climate.

There are six belts of winds that encircle the earth. They push along warm and cold air masses, moisture, storms and pollution.

What are called "trade winds" meet near the equator, causing air to rise. As it does, rain clouds form. This band of cloudy, rainy weather near the equator is known as the *doldrums*.

Up to this point, we've discussed the earth's major climate regions – polar, continental, highland, temperate, tropical and dry.

And we've also discussed the five key factors that influence those climates – altitude, latitude, topography, oceans and large lakes, and the earth's winds.

Now we're going to discuss climate changes. There are several events that shift climate patterns for a short

time – perhaps a year or so.

One is when the temperature of ocean waters change – specifically in the Pacific Ocean where, in normal times, cold water streams move upward to the surface, like this.

The trade winds blow the surface waters toward the west.

But when the streams move downward, the cold waters do not reach the surface – at least, not as much as before. So surface waters become warmer than normal, as shown by the orange and yellow pattern.

This warming is part of what's called an *El Niño* event. During *El Niño* periods, the westward-moving trade winds weaken and the warm surface waters of the Pacific – which help create rainfall – spread to the east.

Meanwhile, rain clouds disappear in the western Pacific without the arrival of the moisture-laden trade winds.

This lack of rain results in severe droughts in the western Pacific, as well as a large number of range fires fed by dry grass.

At the same time, flooding often occurs in Peru, in South America, where the warm moist air builds up and then falls back to earth as rain.

Some of that warm, moist air also moves northward, to North America, where winters in the midwestern U.S. often become mild and more damp than normal.

Sometimes, the cold water stream surges upward at a greater degree than is usually the case.

In these so-called *La Niña* events, cold surface waters, seen in light blue, spread to the west. The warmer surface waters at the head of the surge, in orange, are pushed westward by trade winds and heavy rains and stormy weather are seen more frequently in the western Pacific regions.

Besides variations in the flow and temperature of ocean waters, volcanoes can cause short-term climate changes, too. The

thousands of tons of sulfuric particles that are thrown into the atmosphere when a large volcano erupts can spread thousands of miles as atmospheric winds carry them across the globe.

These particles can block sunlight, and in doing so, can lower temperatures.

Activity on the sun also affects climate. Many scientists believe that sun spots and solar flares may increase the earth's temperature temporarily.

Many scientists also believe that increased amounts of the gas carbon dioxide in the earth's atmosphere may be responsible for global warming.

Carbon dioxide is a by-product of burning fossil fuels, such as natural gas, as well as coal and heating oil to heat and cool buildings.

Carbon dioxide also comes from burning gasoline and other fossil fuels to run cars, boats, trains and airplanes.

Carbon dioxide – or CO_2 – slows the escape of heat from the earth's surface by radiating it back to the ground.

During the past 150 years, it's estimated that the atmospheric carbon dioxide level around the earth has increased about 25 percent, in part, a result of increased fossil fuel use, and, in part, the result of rain forest destruction.

Rain forest trees absorb carbon dioxide.

Now that you know about the earth's climates, let's see how they can affect living patterns.

First, climate affects what people eat. For example, in tropical climates, which support rain forests, people often have a ready-made food supply.

All they have to do is harvest and prepare edible vegetation that grows wild.

Of course, many plants do not grow well in tropical climates.

Wheat is an example.

Wheat grows best in continental and temperate climates. These are the so-called "breadbasket" regions of the world.

Staple foods in these regions include bread and one of the many pasta or noodle variations prepared throughout the world.

Climate also affects how shelters – houses and other buildings – are constructed.

In tropical climates, especially in areas where there is little power for air conditioning, shelters are often open-air buildings that allow breezes to move through interior spaces.

Bricks thick enough to repel the sun's equatorial heat may also be used in hot climates.

In either case, roofing material is generally non-porous to keep frequent rains from getting inside.

In regions that support forest growth, such as those in highland and continental climate areas, lumber is often used to construct shelters.

Clothing, too, is affected by climate.

In the northern parts of continental climates, where it's often chilly and where precipitation is frequent, people commonly wear coats and jackets.

By contrast, such clothing is practically never seen in tropical climates.

It's simply too hot there to wear heavy coats and jackets.

Climate also affects recreational activities. In sunny, warm areas, people often pursue diversions that allow them to take advantage of the temperate weather.

Where it's cold and snowy, recreational activities take a decidedly different turn.

As you undoubtedly have noticed, water plays a key role in climate and the way people adapt to weather conditions. Water is the most common substance on earth. It covers 70 percent of our planet's surface – in oceans, seas, lakes and ponds, rivers and streams.

Water is found in our atmosphere, as clouds.

Water means life.

Every living organism is primarily a vessel for this precious substance.

An elephant is about 70 percent water. A caterpillar is about 80 percent water and a tomato, 95 percent.

We human beings – our bodies – are almost two-thirds water.

We need to replenish our body's supply of water by taking in at least 2½ gallons (or 2.4 liters) of liquid every day.

Under certain conditions, most people can live almost two months without food, yet only about a week without water.

The amount of water on earth, along with the water in the earth's atmosphere, is constant. It never changes.

It is merely recycled again and again in what's called the "water cycle."

Clouds form from water vapor evaporated from the earth – mostly from oceans, but also from rivers, moist land and plants.

The clouds are often pushed along by winds to distant locations. In time, conditions are favorable for the water to drop back to earth as rain, snow, sleet or hail.

The water drains into lakes and rivers, and eventually back to the oceans. And the cycle is repeated.

Water has many different uses, of course – generating electricity in hydroelectric plants, watering crops, cooling radioactive material in atomic energy facilities, becoming the liquid for soft

drinks - the list is almost endless.

Nevertheless, in time, it always returns to where it can evaporate skyward, where it will eventually find its way into a cloud, and then back to earth.

Although our planet's surface is 70 percent water, only one percent of it is used for drinking, cleaning, irrigation and manufacturing.

That's because 97 percent is ocean water, too salty for humans to drink and use in other ways.

Another two percent of the earth's water is locked in ice, which leaves, again, only one percent for human use.

Yet, there is still plenty of this precious liquid for everyone – even when considering our use of water has doubled during the past two decades.

The problem with water is that it isn't evenly distributed around the world. In desert areas, of course, there's very little precipitation.

And, from time to time, droughts appear in areas that normally have plenty of rainfall. As we've mentioned, sometimes these droughts occur during *El Niño* periods.

Droughts can have devastating effects. A particularly cruel one hit south-central Africa several years ago. Countless animals died there as water supplies dried up. The toll in human death was even more tragic.

Today, artificial lakes and other facilities have been built by some governments to help cushion the effects of droughts.

Facilities that take salt out of ocean water and water conservation programs help, also.

All of this points to the clear fact that water plays a major role in living patterns.

In some areas of the world, such as the Amazon River basin, in

South America, water is the principal means of transportation.

Young people travel to and from school in canoes – not school buses or cars.

Moreover, river transport is the only way to move trade items – everything from eggs from the family farm to lumber.

The river also dictates how shelters are built.

Because the Amazon's water levels move up and down, according to tides and rainfall, houses are built on stilts.

Far to the north, in western Canada, water plays an equally important role in the lives of the Nisga'a Indians.

Many of their native dances and music tell about the river and the fish that live in it.

In local schools, river and fish stories – an important focus of tribal folklore – are recounted to youngsters in an attempt to foster traditional Nisga'a culture.

Besides playing a role in folklore and the performing arts water often plays a key role in a region's economy, also.

Many cities, such as Chicago, Illinois, have been built where water is plentiful for people, for transportation, for power generation and for industry.

And, of course, water plays a key role in the economy of agricultural regions worldwide.

What it all boils down to, then, is that our world has many different climates.

Those climates are the result of latitude, altitude, topography, oceans and large lakes, and global wind patterns.

Climates change due to shifts in ocean temperature, volcanoes, activity on the sun and increases in the amount of carbon dioxide in the air.

In addition, the earth's water supply, which remains constant, often plays a major role in a region's transportation its architecture, performing arts, folklore and industry.

Climate and water – they are two key factors in the study of geography.

WEB RESOURCES

What Is La Niña?

<http://www.pmel.noaa.gov/toga-tao/la-nina-story.html>

Excellent in-depth explanations and illustrations, administered by the National Oceanic and Atmospheric Administration (NOAA).

What is El Niño?

<http://www.pmel.noaa.gov/toga-tao/el-nino-story.html>

The companion web site for What is La Niña?

United Nations Framework on Climate Change

<http://www.unfccc.de/>

First-rate information and research on climate change, administered by the United Nations.

National Climatic Data Center

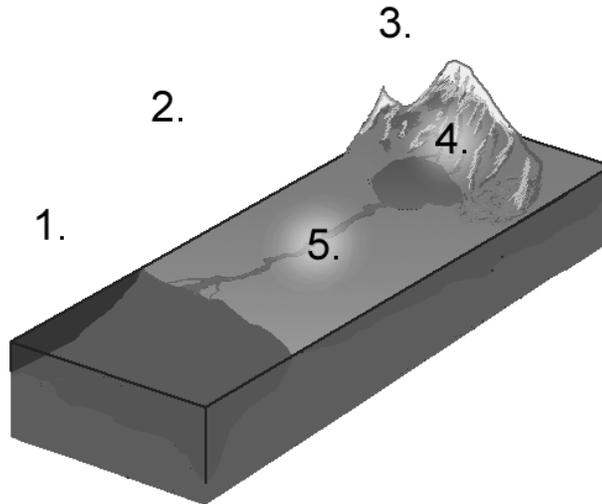
<http://www.ncdc.noaa.gov/ol/ncdc.html>

Excellent links and information on a huge array of climate data, administered by NOAA.

Name _____

The Water Cycle

Directions: Describe what happens in each of the steps of the water cycle in the spaces below. Then, in the box, name five ways that water is used.



1. _____

2. _____

3. _____

4. _____

5. _____

Name _____

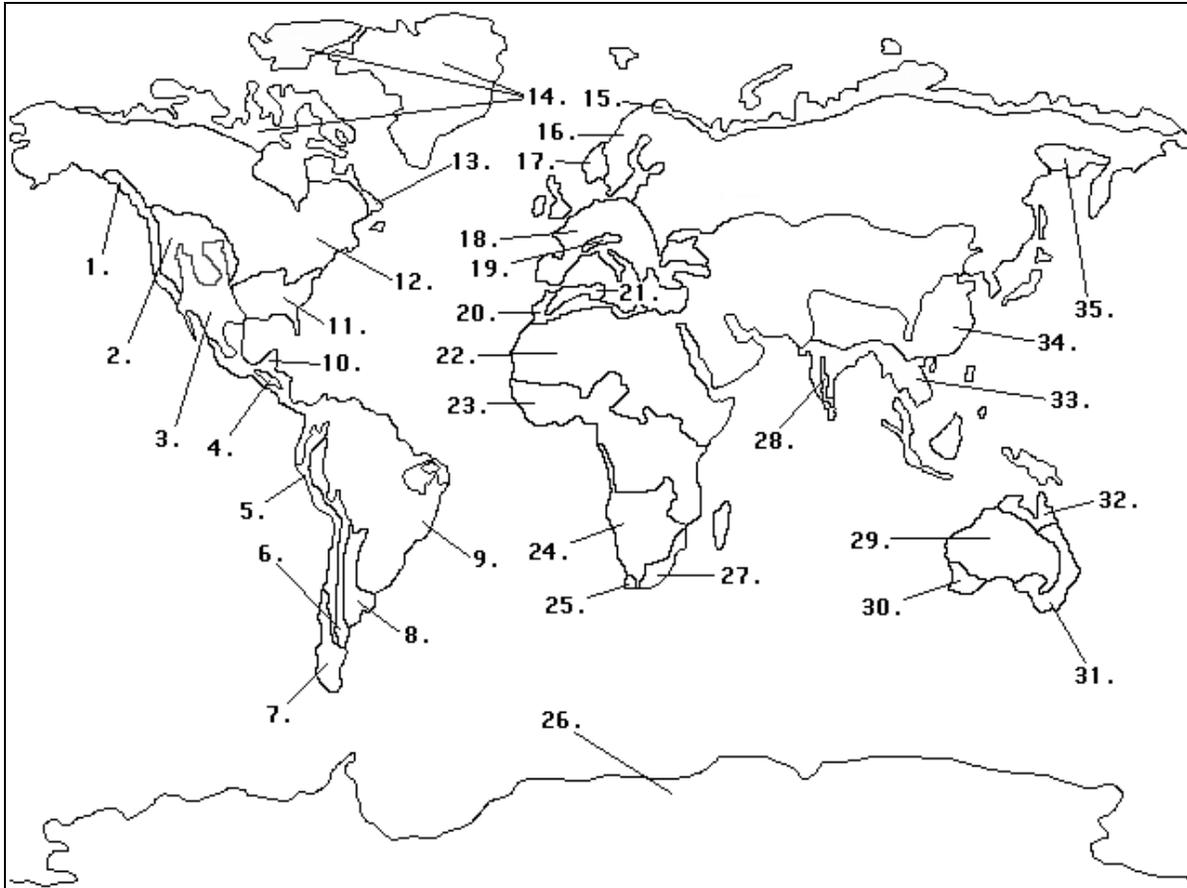
Climate Changes

Directions: Below, you'll find an illustration of a water flow pattern that normally occurs in the South Pacific Ocean. Beneath it, draw an *El Niño* pattern and a *La Niña* pattern. To the right of your illustrations, write a brief explanation of how these two events change climate patterns. Then, on the back of this paper, name the three other factors that cause climate changes, and tell how they do it.



Name _____

CLIMATES



Directions: Next to each number below, tell whether the climate region is dry, tropical, temperate, polar, continental or highland. The first two are done for you to help you get started. After you finish, write a brief description of the type of weather commonly found in each region. You can use the space below the numbers.

- | | | | | | | |
|---------------------|--------------------|-----|-----|-----|-----|-----|
| 1. <i>Temperate</i> | 2. <i>Highland</i> | 3. | 4. | 5. | 6. | 7. |
| 8. | 9. | 10. | 11. | 12. | 13. | 14. |
| 15. | 16. | 17. | 18. | 19. | 20. | 21. |
| 22. | 23. | 24. | 25. | 26. | 27. | 28. |
| 29. | 30. | 31. | 32. | 33. | 34. | 35. |

Name _____

Viewer's Concept Guide

Directions: Fill in the blank spaces.

1. The six major climate regions are _____, _____
_____, _____
_____ and _____.
2. The five factors that affect climate are _____, _____,
_____, _____ and _____.
3. "Rain shadow" areas are known for their _____ and _____.
4. The principal landform of northwestern Italy is _____.
5. During *El Niño* periods, ocean waters in the South Pacific are _____
than normal.
6. During *La Niña* periods, ocean waters in the South Pacific are _____
than normal.
7. During *El Niño* periods, there are often _____ and _____
in western Pacific regions and _____ in Peru.
8. Some scientists say carbon dioxide is responsible for _____.
9. Four ways climate affects human activities are _____,
_____, _____ and
_____.
10. The major problem with water is that _____.
11. Only _____ percent of the earth's water can be readily used by humans.

Name _____

Vocabulary List

Directions: Define the words and terms on the blank spaces.

Altitude _____

Atmosphere _____

Climate _____

Climatologist _____

Continental climate _____

Diversions _____

Drought _____

Edible _____

El Niño _____

Equator _____

Evaporate _____

Folklore _____

Global warming _____

Hemisphere _____

Irrigation _____

La Niña _____

Laden _____

Latitude _____

Moisture _____

Overcast _____

Porous _____

Precipitation _____

Radiant energy _____

Radioactive _____

Rain shadow _____

Replenish _____

Name _____

Vocabulary List, Page 2

River basin _____

Scrubby _____

Steppe _____

Sulfuric _____

Temperate climate _____

Topography _____

Tropical climate _____

Water cycle _____

Name _____

Pre-Test

Directions: Place a "T" in the space next to the statement if it is true, and an "F" if it is false.

- ___ 1. Weather is the climate of a place measured over many years.
- ___ 2. Tropical climates have hot temperatures with frequent rainfall.
- ___ 3. Steppe regions often border highland areas.
- ___ 4. Temperatures drop 5.5⁰ F. every 1,000 feet higher in elevation.
- ___ 5. When it's winter in the northern hemisphere, it's winter in the southern hemisphere.
- ___ 6. "Rain shadows" are found downwind from some mountain ranges.
- ___ 7. San Francisco is an example of a place whose climate is moderated by constant solar activity.
- ___ 8. During *El Niño* periods, water in the southern Pacific Ocean becomes warmer.
- ___ 9. During the past 150 years, carbon dioxide in the atmosphere has increased about 25 percent.
- ___ 10. The "breadbasket" regions are located mostly in the tropics.
- ___ 11. Water is never lost in the "water cycle."
- ___ 12. Children in the Amazon River basin go to schools in canoes.



*CLIMATE, WATER
&
LIVING PATTERNS*

- **NAME THE SIX MAJOR CLIMATE REGIONS**
 - **DESCRIBE EACH CLIMATE REGION**
- **TELL THE FIVE FACTORS THAT AFFECT CLIMATE**
- **EXPLAIN HOW THOSE FACTORS AFFECT CLIMATE**
- **DESCRIBE HOW CLIMATES AFFECT LIVING PATTERNS**
 - **EXPLAIN HOW THE *WATER CYCLE* WORKS**
- **DISCUSS THE IMPORTANCE OF WATER TO ALL LIVING THINGS**

Name _____

Post Test: Climate, Water & Living Patterns

Part I

Directions: Place a "T" in the space next to the statement if it is true, and an "F" if it is false.

- ___ 1. Climatologists use weather balloons, stethoscopes and satellites.
- ___ 2. Climatologists often divide the world into six major climate regions.
- ___ 3. Steppe regions often border deserts.
- ___ 4. It rarely snows in continental climate regions.
- ___ 5. Altitude is one factor that does not affect climate.
- ___ 6. The sun's radiant energy is strongest at the North Pole and South Pole.
- ___ 7. Rain shadows may stretch hundreds of miles downwind from mountains.
- ___ 8. St. Louis's weather is moderated by winds that blow off the Atlantic Ocean.
- ___ 9. The ocean water that flows by Great Britain comes from Africa's west coast.
- ___ 10. Droughts appear in western Pacific regions during *El Niño* events.

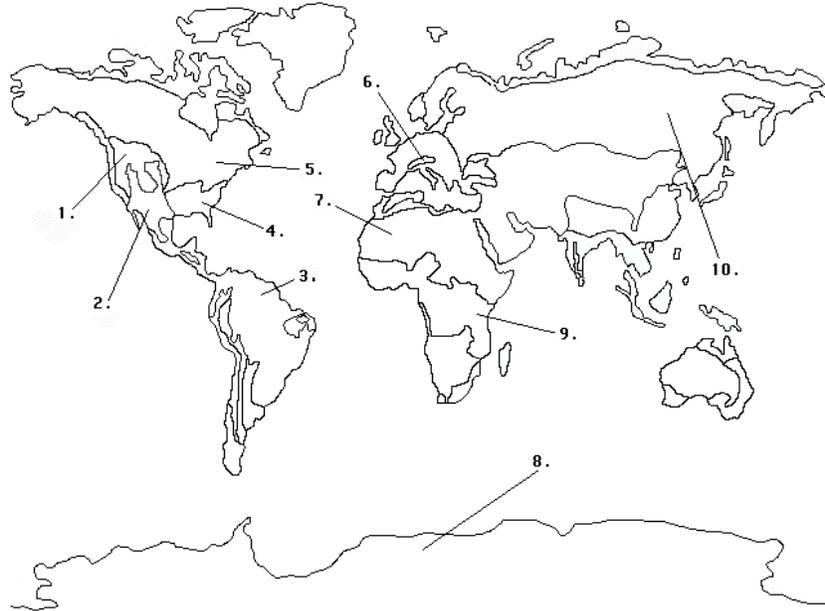
Part II

Directions: Place the letter of the best definition next to the word.

- | <u>Word</u> | <u>Definition</u> |
|----------------------|---|
| 1. ___ Doldrums | a. A kind of power generated by using water. |
| 2. ___ Edible | b. Surface features of the earth. |
| 3. ___ Hydroelectric | c. The mass of gases that surround the earth. |
| 4. ___ Topography | d. Cloudy, rainy weather near the equator. |
| 5. ___ Atmosphere | e. Can be eaten. |

Part III

Directions: Fill in the blanks with the correct name of the climate region.



1. _____ 2. _____ 3. _____ 4. _____
5. _____ 6. _____ 7. _____ 8. _____
9. _____ 10. _____

Part IV

Directions: Fill in the blanks with the correct words or phrases.

- The five factors that affect weather are _____, _____, _____, _____ and _____.
- Five important uses of water are _____, _____, _____, _____ and _____.
- The earth's trade winds meet at _____.
- Some scientists say _____ is responsible for global warming.
- The major problem with water is that _____.

Part V

Directions: Circle the letter next to the word or phrase that most accurately completes the sentence.

1. An example of an area whose weather is moderated by a large body of water is
 - a. the St. Louis, Missouri, area.
 - b. the Moscow, Russia area.
 - c. the British Isles.
 - d. none of the above.
2. Three key factors that affect climate are
 - a. altitude, latitude, earth winds.
 - b. earth winds, topography, carbon dioxide.
 - c. oceans and large lakes, altitude, solar flares.
 - d. sun spots, volcanoes, latitude.
3. During *El Niño* events
 - a. rainfall spreads to the west.
 - b. rainfall spreads to the east.
 - c. rainfall spreads to the north.
 - d. rainfall spreads to the south.
4. During *La Niña* events
 - a. the Pacific cold water stream moves upward.
 - b. the Pacific cold water stream moves downward.
 - c. the Pacific cold water stream increases in volume.
 - d. the Pacific cold water stream decreases in volume.
5. Two factors not affected by climate are
 - a. what people eat and how they build their shelters.
 - b. what people wear and their recreational activities.
 - c. the cars people drive and the television programs they watch.
 - d. none of the above.
6. Water makes up about
 - a. 30 percent of the world's surface area.
 - b. 50 percent of the world's surface area.
 - c. 65 percent of the world's surface area.
 - d. 70 percent of the world's surface area.