Name _____ Date _____

CHAPTER
Concept Map

Weather Patterns

Complete the concept map about weather.

Weather

The average weather in a given region is called _____ .

Weather is predicted by measuring _____ and making _____ .

The variables that contribute to weather are air pressure, _____ , cloud cover, _____ , and wind speed.

Types of Cloud Cover	
Name	Definition
_____ clouds	Clouds composed of ice crystals high in the sky.
Cumulus clouds	_____ _____ _____
_____ clouds	Layered clouds at low altitudes.
Fog	_____ _____

Types of Precipitation	
Name	Definition
_____	Liquid precipitation
Sleet	_____ _____ _____
_____	Water vapor that turns directly into ice crystals
Hail	Raindrops that freeze and then are moved up by wind.

LESSON **Outline**

Name _____ Date _____

The Atmosphere and Weather

Use your textbook to help you fill in the blanks.

How does the Sun warm Earth?

1. Sunlight strikes Earth with the most vertical angle at the _____ .

2. An area near the _____ receives less energy from sunlight than an area of the same size near the _____ .

What are the layers of the atmosphere?

3. When energy from the Sun hits the Earth, 50 percent is absorbed by _____ , and 20 percent is absorbed or reflected by _____ .

4. Particles of gas in the air pressing on Earth's surface create a force called _____ .

What changes air pressure?

5. Atmospheric pressure decreases as altitude _____ .

6. As humidity increases, air pressure _____ .

What are global winds?

7. Winds that blow between 30°North and 30°South latitudes are called the _____ .

8. Air pressure near the equator is _____ than air pressure near the poles, a fact that causes air to move from the _____ toward the _____ .

9. Winds that blow south from the North Pole curve to the _____ because of the _____.

What are local winds?

10. During the day, the Sun heats land more quickly than it heats water, so a(n) _____ blows; during the night, water cools more slowly than land does, so a(n) _____ blows.

11. In the morning, valley breezes blow _____; in the afternoon, mountain breezes blow _____.

How do we measure air pressure and wind?

12. Air pressure is measured with a(n) _____; wind speed is measured with a(n) _____; wind direction is measured with a(n) _____.

Critical Thinking

13. How does Earth's shape affect global temperatures and wind patterns?

_____

_____

_____

_____

_____

_____

_____

LESSON
Vocabulary

Name _____ Date _____

The Atmosphere and Weather

Who am I? What am I?

Choose a word from the word box below that answers each question.

a. air pressure	**d.** humidity	**g.** weather
b. atmosphere	**e.** insolation	
c. global wind	**f.** troposphere	

1. _____ I make the air feel dry or sticky. I am the amount of water vapor in the air. What am I?

2. _____ I am the layer of gases nearest Earth, where all weather takes place. What am I?

3. _____ Look out your window. I am the current condition of the atmosphere. What am I?

4. _____ I am the envelope of air surrounding Earth. What am I?

5. _____ You can count on me to blow steadily in predictable directions over very long distances. Who am I?

6. _____ I am the solar energy that reaches your planet. What am I?

7. _____ I am the weight of air pressing against you. What am I?

Name _____ Date _____

LESSON
Cloze Activity

The Atmosphere and Weather

Fill in the blanks.

air pressure	equator	low air pressure
angle	high air pressure	poles
direct rays	less dense	troposphere

The condition of the atmosphere at any time and place is called weather. Weather occurs in the _____, the layer of the atmosphere closest to Earth. Global weather patterns are largely due to Earth's shape and the _____ at which sunlight strikes Earth in different places. The equator receives more _____ from the Sun, whereas the _____ receive very low angles of sunlight. Therefore, the temperature at the _____ is always higher than that at the poles.

The uneven heating of Earth causes differences in _____. Warm air is _____ and has a lower air pressure than does cold air. Air always flows from areas of _____ to areas of _____. Differences in air pressure cause global winds that blow in predictable directions over long distances.

LESSON **Outline**

Name _____ Date _____

Clouds and Precipitation

Use your textbook to help you fill in the blanks.

How do clouds form?

1. As water vapor rises, it becomes colder and _____ on particles of dust to form _____ .
2. Clouds composed of ice crystals high in the sky are called _____ .
3. Puffy clouds at middle altitudes are called _____ .
4. Layered clouds at low altitudes are called _____ .
5. A cloud close to the ground is called _____ .

How does precipitation form?

6. Raindrops that fall through a layer of cold air can freeze to form _____ .
7. At low temperatures, water vapor turns directly into solid crystals called _____ .
8. Rainfall is measured with an instrument called a(n) _____ .

What are air masses and fronts?

9. When a cold, dry, air mass meets a warm, moist, air mass, the cold air pushes the warm air _____ , producing _____ weather.

10. On a weather map, blue triangles on a line represent a(n) _____ ; red half-circles on a line represent a(n) _____ .

11. Almost all weather fronts in North America are pushed from west to east by the _____ .

What are highs and lows?

12. Areas on a weather map that have the same air pressure are connected with lines called _____ .

13. Low pressure systems bring _____ weather; high pressure systems bring _____ weather.

What do weather maps tell you?

14. To make weather maps, meteorologists collect and analyze data such as _____ , _____ , and air pressure.

Critical Thinking

15. How and why do clouds form along a front?

_____

_____

_____

_____

_____

_____

_____

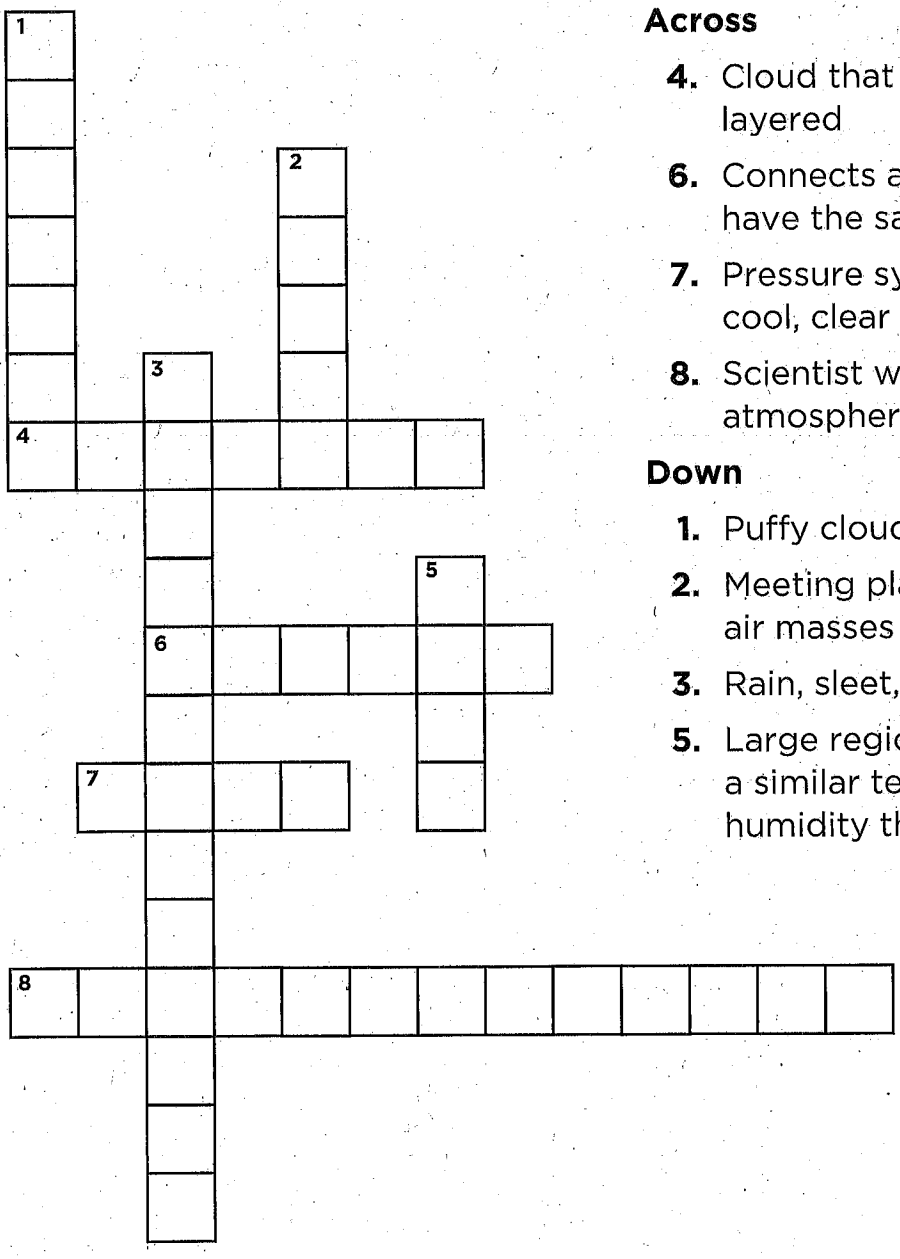
LESSON
Vocabulary

Name _____ Date _____

Clouds and Precipitation

Choose a word from the word box below to finish the puzzle.

cumulus	high	mass	precipitation
front	isobar	meteorologist	stratus



Across

4. Cloud that is low and layered
6. Connects all places that have the same air pressure
7. Pressure system that brings cool, clear weather
8. Scientist who studies the atmosphere

Down

1. Puffy cloud
2. Meeting place between two air masses
3. Rain, sleet, hail, or snow
5. Large region of air that has a similar temperature and humidity throughout

Name _____ Date _____

LESSON
Cloze Activity

Clouds and Precipitation

Fill in the blanks.

air mass	fog	snow	weather
clouds	front	stratus	
cumulus	sleet	warm front	

The formation of precipitation begins when water vapor condenses on dust particles, forming _____. Clouds form in different places and have different shapes— _____ forms close to the ground, layered _____ clouds form at low altitudes, and puffy _____ clouds form at middle altitudes. Cirrus clouds form at the highest altitudes. Water droplets grow larger until they become heavy enough to fall as rain, _____, or _____.

A large region of air that has similar temperatures and humidity throughout is called a(n) _____. As air masses move, they cause changes in the _____. A place where two different air masses meet is called a(n) _____. Warm air moving toward cold air is called a(n) _____. Cold air moving toward warm air is called a cold front.

LESSON **Outline**

Name _____ Date _____

Severe Storms

Use your textbook to help you fill in the blanks.

What are thunderstorms?

1. Updrafts of warm, moist air result in tall clouds called _____ .

2. During a thunderstorm, particles of rain and ice rub against one another as they rush upward and downward, creating _____ .

3. The discharge of static electricity in thunderclouds is seen as _____

4. Lightning suddenly raises the temperature of the air, causing the air to expand violently, and producing a sound known as _____ .

What are winter storms?

5. Winter storms often form when a(n) _____ air mass meets a(n) _____ air mass.

6. Blizzards are snowstorms with _____ mile per hour winds and _____ of a mile visibility.

What are tornados?

7. Tornados begin to form when warm air moves upward in a thunderhead, creating a(n) _____ area that draws more air inward and upward.

8. Air moving into the low pressure closure begins to spin, creating a(n) _____, which becomes a(n) _____ when it reaches the ground.

What are hurricanes?

9. A tropical storm has _____ winds with a(n) _____ pressure area at its center.

10. When wind speeds reach more than 73 miles per hour, a tropical storm becomes a(n) _____.

11. The three types of cyclones are _____, _____, and _____.

How are storms tracked?

12. Weather stations around the world use instruments such as _____, _____, and rain gauges to measure local weather conditions.

13. Weather balloons collect data on _____, _____, and _____ at higher altitudes.

Critical Thinking

14. Explain why severe storms occur along fronts.

_____

_____

_____

_____

_____

LESSON
Vocabulary

Name _____ Date _____

Severe Storms

Match the correct letter with the description.

a. blizzard	**e.** storm surge
b. cyclone	**f.** thunderstorm
c. ground blizzard	**g.** tornado
d. hurricane	**h.** whiteout

1. _____ blizzard that occurs when snow is no longer falling

2. _____ rainstorm with thunder and lightning

3. _____ snowstorm with winds of 35 miles per hour and visibility of a 1/4 mile

4. _____ tropical storm with wind speeds reaching more than 74 miles per hour

5. _____ zero visibility caused by heavy snowfall combined with strong updrafts and downdrafts

6. _____ bulge of water in the ocean, caused by hurricane winds

7. _____ any storm with a low pressure closure that causes the formation of a circular pattern of winds

8. _____ rotating funnel-shaped cloud with winds that blow up to 300 miles per hour

Name _____ Date _____

LESSON
Cloze Activity

Severe Storms

Fill in the blanks.

center	lightning	thunderheads	tropical
front	polar	thunderstorm	tropical storm
hurricane	thunder	tornado	

Storms come in many forms. A severe storm that includes _____ and _____ is called a(n) _____. Warm, moist air is pushed up by cold air along a(n) _____, and _____ form. Sometimes a thunderstorm can turn into a twister, or _____. A thunderstorm can also become a(n) _____, with rotating winds and a low pressure area at its _____. Such a storm can turn into a(n) _____.

Winter storms often form when a continental _____ air mass meets a maritime _____ air mass. A winter storm can drop many forms of precipitation.

Name _____ Date _____

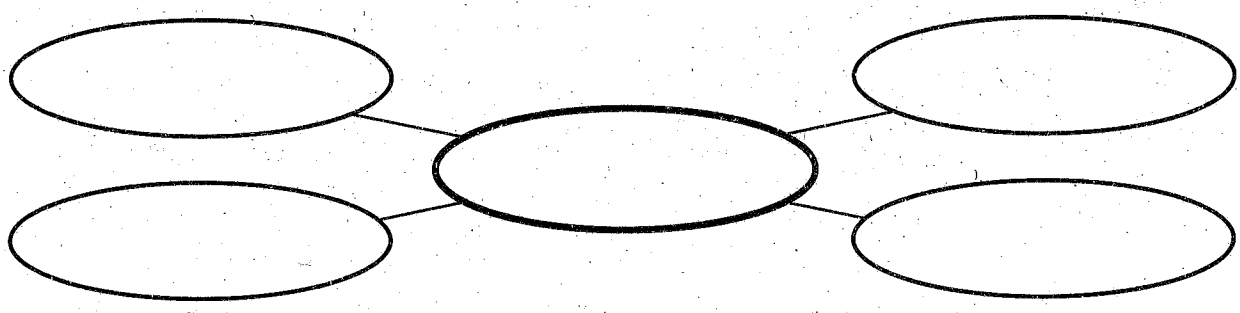
Living Through a Mudslide

Write About It

Write a personal narrative about a storm, mudslide, or other severe weather condition that you have experienced. Use a clear sequence of events to tell what happened and what you did.

Getting Ideas

Choose a severe weather condition you have experienced. Write its name in the center circle. Then put on your thinking cap. Write words and details that tell about this weather condition in the outer circles.



Planning and Organizing

Here are some sentences that Kevin wrote to tell about his experience during a hurricane. Number the sentences from 1-4, by 1 being the sentence that comes first.

_____ Next, the winds picked up, knocked over garbage cans, and tossed the trash like balls in the air.

_____ First, the sky grew dark as a wall of clouds marched in.

_____ Then, the waves built, growing higher and higher, until they crashed over the railings along Shore Road.

_____ Finally, Mom and Dad moved us all to the shelter before the full force of the storm hit.

Name _____ Date _____

Drafting

Write a sentence to begin your personal narrative. Introduce yourself by using the pronoun "I." Name the weather condition and tell how it made you feel.

_____

_____

_____

Now write your personal narrative. Use a separate piece of paper. Begin with the sentence you wrote above. Tell about the events in time order. Use time-order words to make the sequence easy to follow.

Revising and Proofreading

Here is part of Kevin's personal narrative. He made five mistakes in grammar. Find the mistakes and correct them. Cross out the error. Write the correction above it.

It started out as a beautiful day in late September. The sun was shining bright and the temperature were mild. My friends and I think it would be a great day for a bike ride along Shore Road. Was we ever wrong! My sister heard the announcement first and calls me into her room.

Now revise and proofread your writing. Ask yourself:

- Did I use the pronoun "I" to identify myself?
- Did I tell the events in sequence?
- Did I correct all mistakes in grammar, spelling, punctuation, and capitalization?

LESSON **Outline**

Name _____ Date _____

Climate

Use your textbook to help you fill in the blanks.

What is climate?

1. Two variables that are important in determining climate are _____ and _____ .

2. The global variable that has the strongest effect on climate is _____ .

3. Areas along the equator are located in the _____ zone.

4. A way to categorize an area's climate is to describe the _____ that grow there.

5. Many scientists are concerned that the global climate is _____ .

6. Radiated heat from Earth's surface is _____ by a layer of greenhouse gases. Some of the heat then radiates back and warms Earth.

7. Greenhouse gases include _____ , _____ , and _____ .

8. Burning _____ increases the amount of greenhouse gases in the atmosphere, a factor in _____ .

Name _____ Date _____

LESSON **Outline**

What affects climate?

9. The temperature of an inland city is usually _____ in summer and _____ in winter than the temperature of a coastal city.

10. At a given latitude, the higher the altitude, the _____ the climate.

11. The climate on the _____ side of a mountain is wetter and cooler than the climate on the _____ side.

What is El Niño?

12. A cold current along the coast of Peru causes air pressure to be _____ in the eastern Pacific than it is in the western Pacific.

13. El Niño brings _____ to the coasts of North and South America; La Niña brings _____ to these coastal areas.

Critical Thinking

14. Location A is near the equator on the windward side of a mountain. Location B is at 30°N latitude on the east side of the Atlantic Ocean. Describe the climate in each location. Explain your answers.

_____

_____

_____

_____

_____

LESSON
Vocabulary

Name _____ Date _____

Climate

Choose a word from the word box below to complete the puzzle.

climate	Gulfstream	polar	tropical
ENSO	La Niña	temperate	windward

Across

2. Climate zone located along the equator

3. Average weather of a place

5. Climate zone located at the North and South poles

7. Wetter side of a mountain

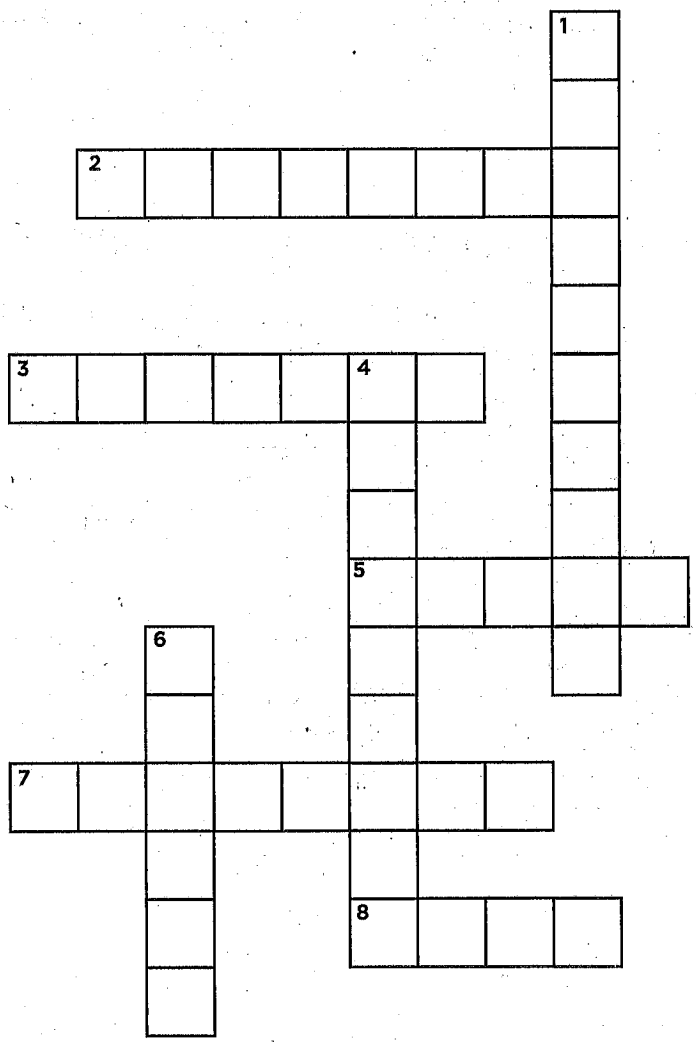
8. Comings and goings of El Niño

Down

1. Ocean current that warms Europe

4. Climate with warm summers and cold winters

6. The dryer weather that occurs when the current along the Peruvian coast sinks



Name _____ Date _____

LESSON
Cloze Activity

Climate

Fill in the blanks.

altitude	precipitation
body of water	temperature
latitude	temperate
ocean currents	tropical

The type of weather that exists in a place over the long term is its climate. The two most important variables that determine climate are _____ and _____. It is possible to predict the climate of an area if you know its _____.

Areas near the equator have _____ climates and the highest temperatures. They also have heavy precipitation during at least part of the year. Areas near the poles have polar climates. Areas between the tropical and polar zones have _____ climates. Other factors that affect climate are distance from a(n) _____, _____, and _____. All of these factors can give you a general idea of the climate of an area.

Name _____ Date _____

Museum Mail Call

Read the following letters from the Reading in Science passage in your textbook. Underline the sentences or phrases that describe the features of each area.

June 13

Dear Museum Scientists,

Hola! (That's "hello" in Spanish) It's the dry season here in Palmdale right now and it's *muy caliente*—very hot! We haven't had rain in weeks.

It's usually hot and dry here from May to November. We don't have a lot of water, so it has to be piped in from other areas. Restaurants only serve water to people who ask for it.

Some people plant cactuses and shrubs around their homes. I planted jalapeño peppers with *mi hermana*, my sister. We water the plants in the evening. That way the hot sun won't dry up all of the water.

Carlos

June 23

Dear Museum Scientists,

The *gio mua*, or monsoons, have brought wet weather to our land. Everything here is soaked! Our monsoon season lasts from May to October. Many inches of rain can fall during heavy storms. But the storms only last for about an hour each day. It's very hot, so we don't mind getting wet.

Our farm is near the Mekong River. Water floods our rice fields and helps the rice grow. It's hard work walking through the swampy ground. We carry the rice with *quang ganh*. These are baskets that we balance at the end of a pole.

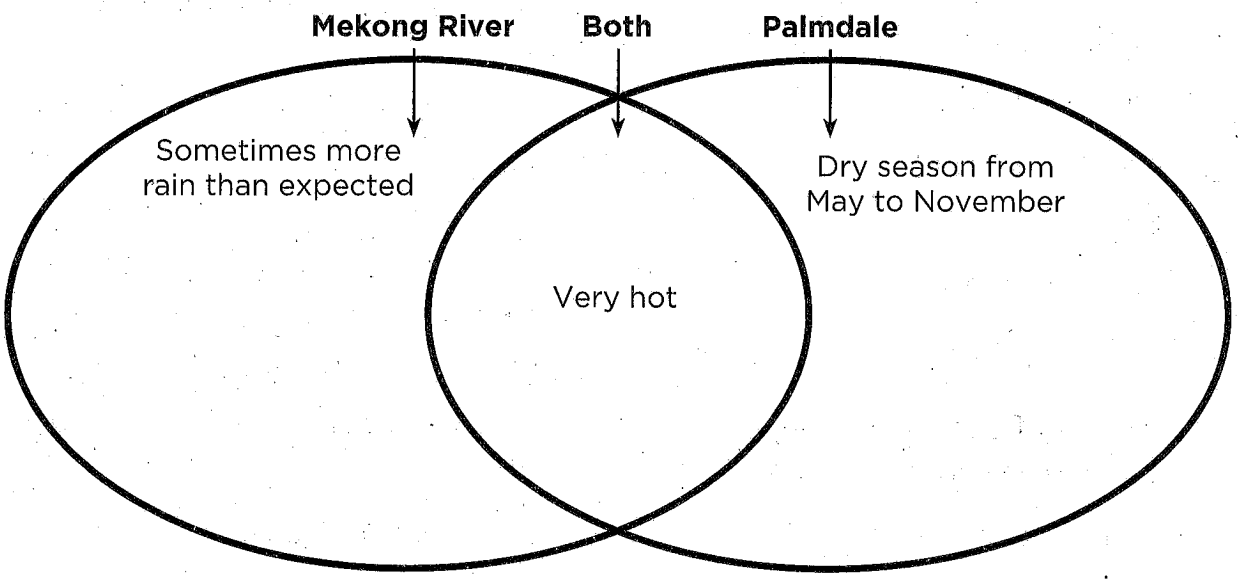
People here are used to a lot of water. We build our houses on stilts so the water won't get in. Some years, there is more water than we expect!

Vang

Name _____ Date _____

Compare and Contrast

Fill in the Venn diagram below with the facts that you underlined in each of the letters on the previous page.



Write About It

Compare and Contrast How does the weather in Palmdale compare with the weather near the Mekong River? What activity do both Carlos and Vang do?

Compare and Contrast

Answer the following questions, using the information you have about both Palmdale and the Mekong River.

1. How does the weather in Palmdale compare with the weather near the Mekong River?

_____

_____

2. What activity do both Carlos and Vang do?

_____

_____

Name _____ Date _____

Weather Patterns

Choose the letter of the best answer.

1. The layer of gases closest to Earth, where all weather takes place, is called the
   - **a.** thermosphere.
   - **b.** troposphere.
   - **c.** stratosphere.
   - **d.** exosphere.

2. Which of the following causes an increase in air pressure?
   - **a.** increase in altitude
   - **b.** increase in volume
   - **c.** increase in humidity
   - **d.** decrease in temperature

3. Global winds occur because
   - **a.** air pressure near the poles is lower than air pressure near the equator.
   - **b.** sunlight heats areas near the equator more than it heats areas near the poles.
   - **c.** sunlight warms the air over land faster than it warms the air over water.
   - **d.** sunlight warms the air over mountains faster than it warms the air in valleys.

4. Air pressure is measured with a(n)
   - **a.** anemometer.
   - **b.** wind sock.
   - **c.** thermometer.
   - **d.** barometer.

5. Because of the Coriolis Effect, winds that blow south from the North Pole
   - **a.** curve to the right.
   - **b.** curve to the left.
   - **c.** speed up.
   - **d.** slow down.

6. A cloud close to the ground is called
   - **a.** a cumulus cloud.
   - **b.** a stratus cloud.
   - **c.** fog.
   - **d.** a cirrus cloud.

7. Which of the following best describes how snow forms?
   a. Water vapor freezes directly into a solid.
   b. Water droplets freeze and then fall as precipitation.
   c. Water droplets collide with bits of ice and freeze.
   d. Water droplets fall through a layer of cold air close to the ground.

8. An air mass that forms over northern Canada will be
   a. cold and humid.
   b. cold and dry.
   c. warm and humid.
   d. warm and dry.

9. Which of the following best describes how the weather will change when a cold front moves into an area?
   a. The weather will become drier.
   b. The weather will become clear and cool.
   c. The weather will become stormy, but when the front passes, the weather will become cool and dry.
   d. The weather will become stormy and warmer.

10. Which of the following is a cyclone?
   a. thunderstorm
   b. blizzard
   c. ice storm
   d. hurricane

11. When do storm surges occur?
   a. during a blizzard
   b. during a hurricane
   c. during a thunderstorm
   d. during a tornado

12. A storm that has an eye and rotating winds that reach 74 miles per hour is called a
   a. tropical storm.
   b. cyclone.
   c. tornado.
   d. hurricane.

13. A sudden discharge of static electricity during a thunderstorm is called
   a. thunder.
   b. lightning.
   c. a low pressure closure.
   d. a downdraft.

Name _____ Date _____

The Universe

Complete the concept map with information you learned about the universe.

The _____ is a huge space that holds energy and matter.

↓

Most of the matter is in groupings of stars, dust, and gas called _____, which can be spiral, _____, or irregular.

↓

The spiral _____ that you live in is called the _____.

↓

This galaxy includes the _____, which has the Sun at its center.

↓

The solar system has eight _____ that orbit the Sun. These include Mercury, _____, Earth, Mars, _____, Saturn, Uranus, and Neptune. Many of these have natural satellites called _____.

↓

The solar system also has rocky asteroids and icy _____ that orbit the Sun.