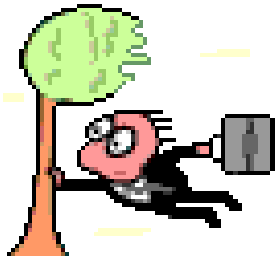
Weather Unit



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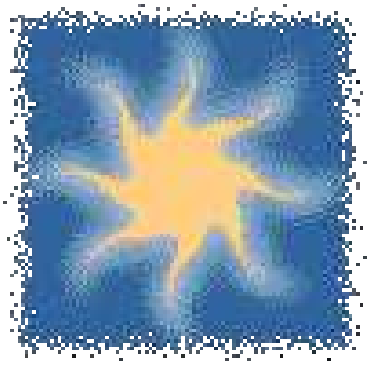

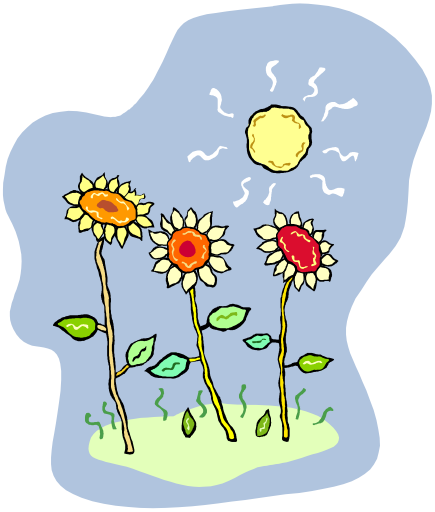

KWL Chart of Weather		
What do I KNOW about weather? ▪ _____ _____ _____ ▪ _____ _____ _____	What do I WANT to know about weather? ▪ _____ _____ _____ _____ _____	What did I LEARN about weather? ▪ _____ _____ _____ _____ _____ _____

Answers will vary but must be in complete sentences.

1. What is your favorite season?

_____

_____

2. What are some of the things you do during your favorite season?

_____

_____

Fill in the graph below

Write one thing you like about the weather in each season and one thing you don't like.			
Fall ☺ ☹	Winter ☺ ☹	Spring ☺ ☹	Summer ☺ ☹

Chapter 9 Weather

Vocabulary

1. troposphere: layer of atmosphere closest to the Earth's surface

2. relative humidity: amount of water vapor in the air compared with the total amount that the air can hold at the temperature

3. air mass: a large body of air that has about the same temperature and moisture throughout

4. boundary front: the boundary or area of contact, between two air masses

5. storm: a weather disturbance caused by unusual weather conditions

6. thunderstorm: a small local storm with tall clouds, heavy rain, and thunder and lightening

7. hurricane: a large tropical storm that has very high wind span and heavy rainfall

8. tornado: a small funnel of quickly spinning air

9. weather forecast: a prediction of what future weather conditions will be

10. meteorologist: a scientists who studies weather

Temperature Data Sheet

On the following chart, please write the date, the temperature for that day (high and low), and draw a visual for the day's weather.

Date _________ Temperature High_________ Low _________	Date _________ Temperature High_________ Low _________	Date _________ Temperature High_________ Low _________	Date _________ Temperature High_________ Low _________	Date _________ Temperature High_________ Low _________
Date _________ Temperature High_________ Low _________	Date _________ Temperature High_________ Low _________	Date _________ Temperature High_________ Low _________	Date _________ Temperature High_________ Low _________	Date _________ Temperature High_________ Low _________
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Name _____ Date _____ #

Thermometer Care

A thermometer is a tool that measures air temperatures. Temperature is how hot or cold the air is.

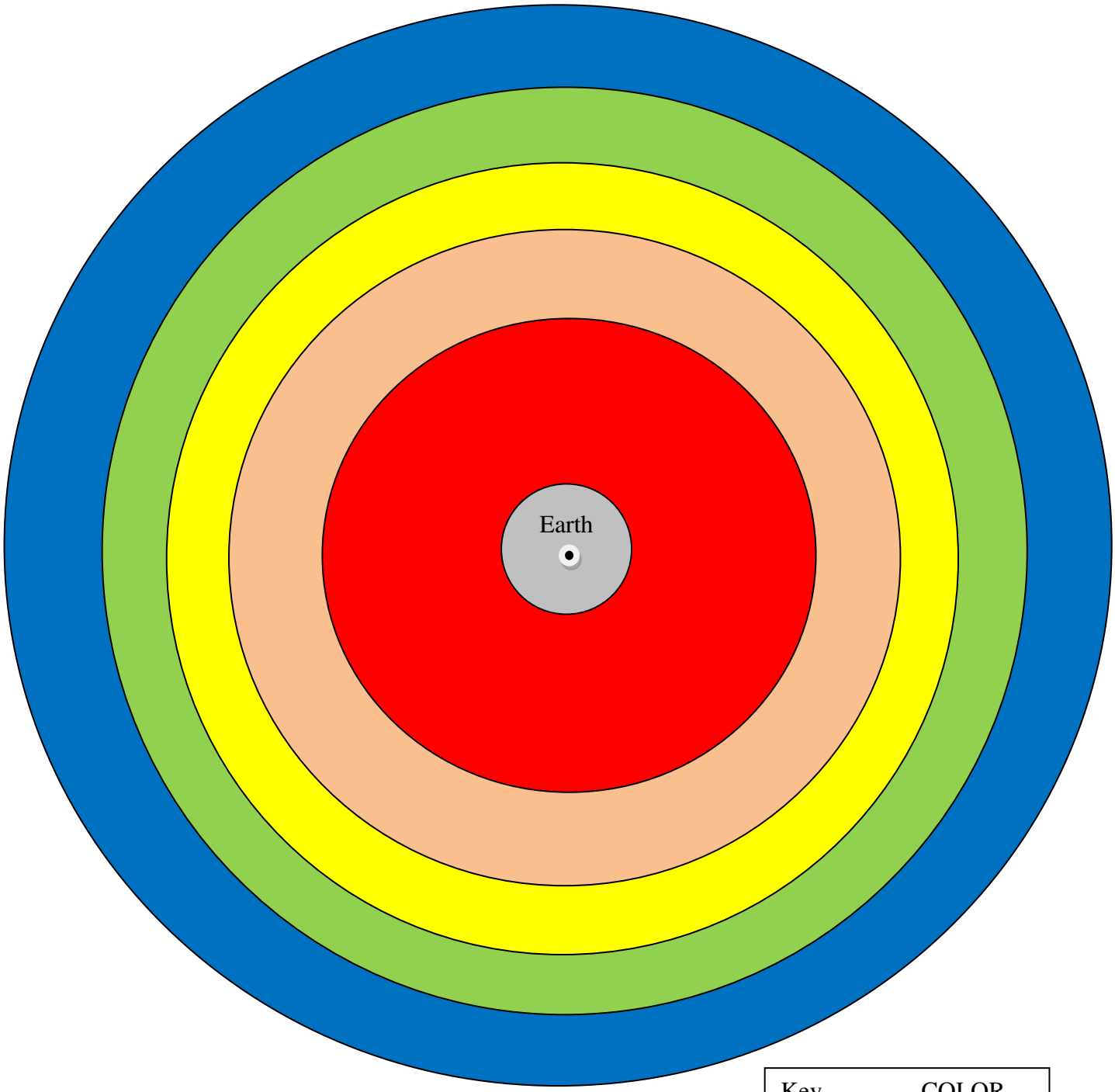
How do we handle thermometers?

1. Do not throw them!
2. Handle them with care.
3. Hold it very carefully.
4. Try not to drop them.
5. Use it correctly and appropriately.

What are the characteristics of a thermometer?

1. Fahrenheit side and Celsius side
2. Mercury in the thermometer
3. Measurement is in degrees

The Atmosphere has layers



Weather and the Atmosphere

Atmosphere

Invisible blanket of air that surrounds the earth

Divided into layers

Layer closest to the earth's surface is the troposphere

most of the air is found in the troposphere

Nitrogen and oxygen make up most of the air

Weather

Conditions are air temperature, air pressure, wind, and water in the form of ice, water droplets, or water vapor

Relative Humidity

amount of water vapor in the air compared with the total amount that the air can hold at that temperature

measured by a psychrometer

Air Pressure

the force exerted by the air

cool air tends to sink and warm air rises

Air Temperature

Warms the earth's surface

depends on energy from the sun

Name _____ Date _____ #

Weather and Atmosphere /25 points

Directions: Please read and listen to pages 306-312 in the Horizon book. Please write at least 1 important thing you learned while listening.

1. *Answers will vary; however, all spelling, punctuation, etc. are ½ pt. each +4 points*

Please draw a picture of how nitrogen enters and leaves the air.

Drawing must include

1. Nitrogen into soil
2. Nitrogen in soil
3. Animals eating grass/nitrogen
4. Trees/plants releasing nitrogen
5. EVERYTHING MUST BE LABELED

+5 points

Please draw a picture of how carbon dioxide enters and leaves the air.

Drawing must include:

1. Plants and animals taking in oxygen
2. Plants and animals giving off carbon dioxide
3. Factories giving off carbon dioxide
4. EVERYTHING MUST BE LABELED

+4 points

Please answer the following questions in complete sentences.

1. What two gases make up most of the air? The two gasses that make up most of the air are nitrogen and oxygen. +3

2. What are four conditions that make up weather? The four conditions that make up weather are air pressure, wind, water in the form of ice, water droplets, and water vapor. +7

3. What causes air pressure? The force exerted by the air causes air pressure. +2

Air Masses and Fronts

Air Mass

large body of air that has about the same temperature and moisture throughout it

affect weather

If an air mass is near the North or South poles, it is cold

If an air mass is near the equator, it is warm

If an air mass forms over land it is dry. If it forms over water it is wet.

fronts
boundaries or area of contact between air masses

COLD FRONTS

Cold air mass takes over a warm air mass

Warm air rises and then cools

STORMS FORM

WARM FRONTS

Warm cloudy weather

Cirrus clouds form

Warm air takes over cold air

Name _____ Date _____ #

Air Masses and Fronts /20

Directions: Please read and listen to pages 306-312 in the Horizon book. Please write at least 1 important thing you learned while listening.

1. *Answers will vary. Need to be in complete sentence and spelling, punctuation, etc. counts ½ pt. +2*

Please draw a picture of how nitrogen enters and leaves the air.

+1 Nitrogen entering the air
+1 Nitrogen leaving the air
+1 Picture is colored
+1 Picture is labeled

Please draw a picture of how carbon dioxide enters and leaves the air.

+1 Carbon dioxide entering the air
+1 Carbon dioxide leaving the air
+1 Picture is colored
+1 Picture is labeled

Please answer the following questions in complete sentences.

1. What two gases make up most of the air? The two gases that make up most of the air are oxygen and nitrogen. +3 (nitrogen, oxygen and restate)

2. What are four conditions that make up weather? The four conditions that make up weather are air temperature, air pressure, wind, and water (in the form of ice, water droplets, and water vapor). +5

3.What causes air pressure? The force exerted by the air causes air pressure. +2

Name _____ Date _____ #

Air Masses and Fronts /20

Question to explore: **What happens when warm and cold air masses come in contact?**

Remember~ Warm air masses and cold air masses have different densities, just like oil and water. Observe how oil and water interact to simulate a front.

Materials:

- One Jar with top(cleaned out)
- Two cups
- Cooking Oil
- Cold Water
- Red and Blue food coloring

Directions:

1. Fill one cup with oil.
2. Fill one cup with water.
3. Fill jar half way with cooking oil. Add one drop of red food coloring to the oil. Put cap on the jar. Shake to mix. Be very careful you put the cap on tight.
    a. This represents the warm air mass. +1
4. Add one drop of blue food coloring to the water. Stir the water.
    a. This represents the cold air mass. +1
5. Gently remove the cap of the jar. Gently pour the cold water into the jar of oil. Observe how the colored liquids react to each other. Cover tightly, turn the jar on its side, and observe how the liquids move. Move the jar gently in other ways.

~Draw and two diagrams of your experiment. Label the drawings.

DRAW/Color materials used +6
Must have
1. Two cups
2. Two food coloring
3. Jar
4. Colored

Draw/Color the liquids in jar. Label Cold Air Mass and Warm Air Mass +4
Must have
1. Diagram of jar
2. Labeled warm air mass
3. Labeled cold air mass
4. colored

Please answer the following questions in COMPLETE SENTENCES. +8
(Correct answer and restate)

1. Describe how the liquids move.

The two liquids are oil and water. The oil rises above the water.

2. Which liquid is denser? Explain.

Water is denser because it sinks to the bottom.

3. How does this model show what happens between air masses?

This model shows how a warm air mass rises and cold air mass sinks when they meet.

4. Is warm or cold air denser?

Cold air is denser because it sinks.

Storms

Weather disturbance caused by unusual weather conditions

Start when, warm, moist air rises

Can be rain, sleet, hail, or snow

Most common storm is the thunderstorm

Hurricanes

- Large tropical storms
- Heavy rain
- Powerful winds
- Form over warm, tropical oceans
- Circular center, known as the EYE
- Form when a cold air mass and warm air mass meet

Tornadoes

- Small funnels of quickly spinning air
- Form over LAND
- Like a vacuum-sucks everything into the funnel and spits it out
- Most powerful winds (400 mph)
- Form when a cold air mass and warm air mass meet

Name _____ Date _____ #

Storms /15

Directions: Please read and listen to pages 320-325 in the Horizon book. Please write at least 1 important thing you learned while listening.

1. *Answers will vary. Need to be in complete sentence and spelling, punctuation, etc. counts ½ pt. +2*

Please draw a picture of a tornado and a hurricane.

Tornado	Hurricane
1. Drawing is correct 2. Colored +2	1. Drawing is correct 2. Colored +2

Please answer the questions in complete sentences.

1. Name at least three storms. Three storms are thunderstorms, tornadoes, and hurricanes. +3 restate +1
2. How is a thunderstorm different than a hurricane? Four ways a thunderstorm is different than a tornado is the wind speed, size, amount of rain, and time. +4 restate +1

Kinds of Clouds

Cumulus	Stratus	Cirrus	Cumulonimbus
			
heaps of clouds that look like mounds of cotton	clouds that are spread out and look like a low covering just overhead	wispy curly clouds that look like a horse's tail	dark clouds that look like a huge puff of smoke

Clouds can be divided even further by classifying them into groups on their shape, structure, and height above ground.

	low-level	mid-level	upper-level
Mounded or Heaped Clouds	fair-weather cumulus	Cumulus	non-precipitating cumulonimbus
Tiered or Layered Clouds	stratus	altostratus	Cirrostratus
combined cloud types	Stratocumulus	Altocumulus	cirrocumulus
Rain Clouds	Nimbostratus	Precipitation altocumulus	Cirrus/precipitating cumulonimbus

Name _____ Date _____ #

Please read pgs. 4-5 in Weather Forecasting and complete the diagrams and answer the following questions.

The Water Cycle

Drawing must include

Evaporation

Condensation

Precipitation

Run off

Clouds form and raindrops fall because of the water cycle. The sun heats water on Earth. Some of that water evaporates, or changes to a gas. Water vapor in the air rises. It cools and condenses to form clouds. Precipitation falls from clouds back to Earth. The cycle starts over again.

Please read pgs. 12-15 in Weather and Climate and answer the following questions.

1. The process of turning liquid water into water vapor is called evaporation.
2. When warm air rises, it starts to cool.
3. When air cools, the water vapor changes back into tiny droplets of liquid water. Sometimes the vapor turns into ice crystals. This is called condensation.
4. When the water droplets join together and get heavy, they fall. This is called precipitation.
5. The cycle of evaporation, condensation, and precipitation is called the Water Cycle.
6. A warm front occurs when a warm air mass meets and glides up over a cold air mass.
7. A storm with strong winds and falling snow is called a blizzard.

Definitions

Precipitation: water falling back to earth in the form of hail, sleet, snow, or rain

Evaporation: water turning into a gas or water vapor.

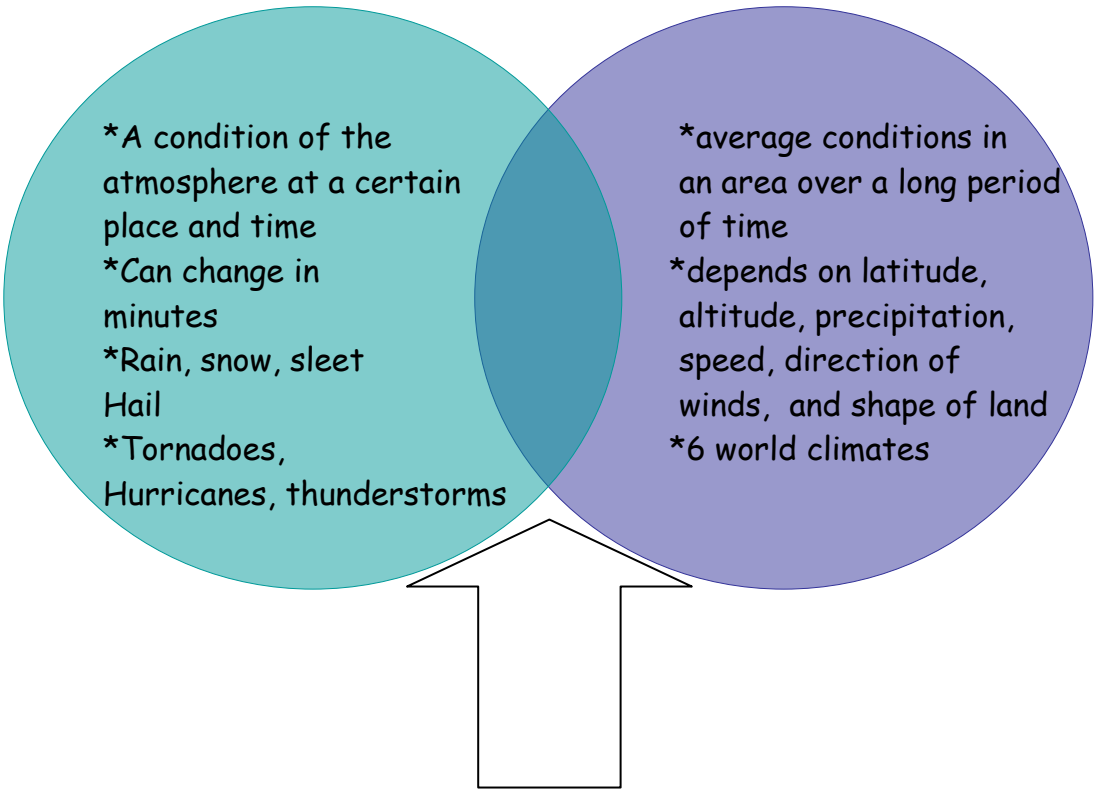
Condensation: water changing back to tiny droplets of liquid water and forming clouds.

Run off: Water returning to streams, lakes, rivers, and oceans.

Name _____ Date _____ #

Venn Diagram
Weather and Climate

Weather



Climate

Similarities:
Satellites help climatologists and meteorologists
Involve Precipitation

Weather forecast: Today's high was 65 degrees F and its low was 55 degrees F with high cloud coverage throughout the day.

Climate forecast: Montreal, Canada has cool to warm summers, cold winters, and some precipitation.

Name _____ Date _____ #

National Geographic: Extreme Weather

Please fill in the blanks from your reading. You do not have to restate your answer.

Introduction

1. What was one of the worst hit sites of the May 4, 2003 tornado? Pierce City, Missouri

2. What did the governor of Missouri call this tornado? The most devastating series of tornadoes

3. About how many tornadoes would touch the country's midsection after May 4th? 300

Chapter 1: Raging Forces

4. What is one sign of drought? Pierce City, Missouri

5. What kind of weather includes conditions that endanger people's lives or damage property? Extreme weather

6. Name 5 types of extreme weather. Drought, tornadoes, hurricanes, blizzards, thunderstorms, heavy rain, bitter cold, pounding hail, blinding snowstorm

7. What is humidity? Humidity is moisture in the air

Storms on the Horizon

8. What is the term for water in the form of a gas? Water vapor

9. What does warm, moist air do during the day? rise

10. As the air cools, its water vapor condenses**, or changes into tiny droplets of liquid water and ice crystals.**

Thunderheads

11. Warm, moist also rises rapidly at a cold front.

12. What are updrafts? Upward movement of warm, moist air
13. What are thunderheads? Violent system of updrafts_

Flash….Boom!

14. What builds up in the updrafts and downdrafts? Positive and negative electric charges
15. What is the explosion in the cloud of a thunderstorm? thunder
16. What do you see first in a thunderstorm? lightning

Tornadoes

17. What is a funnel-shaped cloud of spinning, rising air called? tornado

Low Pressure in Tornadoes

18. What is Air Pressure? The force of air pressing down on Earth's surface
19. If there is a greater difference in the air pressure the wind is faster

Hurricanes

20. Where are the starting points of hurricanes? Warm, tropical oceans near the equator

The Eye of the Storm

21. What is the center of the hurricane called? eye
22. What is unique about the eye of the storm? It is calm

Running Out of Energy

20. What type of water does a hurricane need to keep its strength? Warm water

Name _____ Date_____

Weather Assessment
Study Guide

The test will be given on October 4, 2012
If you get a parent signature on this paper, you will receive 3 extra points on your test. This paper is due on October 4, 2012
Parent Signature: _____

Use your Weather unit and assignments in your Friday Folder to help you study the following questions for your Weather Test. You can write on this paper or attach any other papers to this paper.

What do I need to know?

1. The stages of the water cycle (identify and describe)

The four stages of the water cycle are evaporation, condensation, precipitation, and run off. Evaporation is the change from liquid water to a gas (water vapor). Condensation is the change from water vapor to liquid water (formation of clouds). Precipitation is water that falls to the Earth's surface. It can take the form of rain, snow, sleet, or hail. Runoff is when water falls or "runs" back into the oceans, streams, ponds, lakes, or rivers.

2. What is the source of energy for the water cycle? The Sun
3. What is the atmosphere? The atmosphere is the invisible blanket of air that surrounds the earth. It has 5 layers.
4. What layer of the atmosphere does weather take place? troposphere
5. Differences between weather and climate. Characteristics of each. Study the Venn Diagram.

Differences: Weather is a condition of the atmosphere at a certain place and time. It can change in minutes. A condition of weather include rain, snow, sleet, tornadoes, hurricanes, thunderstorms, and hail. Climate is the weather conditions in a n area over a long period of time. Climate depends on latitude (how far away from the equator), altitude (how far away from sea level), precipitation (rain, snow, sleet, or hail), speed/direction of wind, and the shape of the land (mountains, islands, etc.).

6. What causes weather? The uneven heating of the earth's surface.
7. What do you call a person who studies weather? meteorologist

8. What is air pressure? Air pressure is the force exerted by the air. Does warm or cool air exert more pressure? Cool air
9. What causes wind? The uneven heating of the earth's surface causes different pressures.. How does wind form? Air tends to move from regions of high pressure to regions of low pressure. This is moving air is called wind.
10. What three conditions are needed for clouds to form? Warm air rising, cooling, and water vapor condensing to form clouds
11. What types of instruments are used to measure weather? What is the function of each? Doppler Radar: meteorologists use this technology to detect dangerous weather like tornadoes. Rain gauge: what you use to tell how much rain fell yesterday. Thermometer" this tool can tell you how warm or cold it is outside. Barometer: to measure air pressure. Wind vane: to see what direction the wind is blowing. Anemometer measure wind speed. Satellite shows images from space to help meteorologists. Psychrometer measures relative humidity.
12. How are thunderstorms, tornadoes, and hurricanes different? How are they the same?
    Thunderstorms, tornadoes, and hurricanes are the SAME because they are all extreme weather conditions, they form when warm, moist air rises rapidly, low pressure at the earth's surface, and they all have clouds that either have rain, sleet, hail, or snow. Storms also have strong winds. All can cause distruction and even death.
    DIFFERNCES: A thunderstorm is a small, local stromw ith tall clouds, heavy rain, and thunder and lightning. Most thunderstoms form along cold fronts. Thunderstorms do not last very long. A severe thunderstorm can realase as much energy as a small nuclear bomb.
    A hurricane is the largest strom. It has high winds and heavy rainfall. Hurricanes from over water, usually tropical oceans. Hurricanes cause much damage due to heavy rains and strong winds.
    Tornadoes are small funnels of quickly spinning air. They will form during a violent thundestom. Torndado wind speeds are the highest.
13. Where does each of the three storms form? Thunderstorms: along a cold front. Hurricane: warm, tropical water. Tornadoes: in the Midwest and a long the coasts of the Gulf of Mexico and the Atlantic Ocean.
14. How does an extreme weather condition impact the economy (money) of a region? Storms can cause much damage and in result costing a lot of money to rebuild structures.

15. You should know the vocabulary to help you with questions on the test.
    Unit page 4
16. The difference between a weather forecast and a climate forecast.

Weather forecast: Today's high was 65 degrees F and its low was 55 degrees F with high cloud coverage throughout the day.

Climate forecast: Montreal, Canada has cool to warm summers, cold winters, and some precipitation

Name _____ Date _____ #

Directions: Read each sentence below. Then choose the weather tool from the list that fits the description.

barometer	anemometer	satellite	thermometer
Doppler radar	wind vane	psychrometer	rain gauge

1. Meteorologists use this technology to detect dangerous weather like tornadoes. Doppler radar
2. What you use to tell how much rain fell yesterday. Rain gauge
3. This tool can tell you how warm it is outside.

thermometer

4. If you want to know the air pressure, this would be the instrument to use. barometer
5. Want to know the direction of the wind? Look at this. Wibd vane
6. Check this if you want to know the speed of the wind.anemometer
7. Images from this help meteorologists see weather systems that are far away, show cloud cover over an area, and much more. satellite
8. This instrument measures relative humidity.

psychrometer

Name _____ Date _____ #

Weather and Climate

Please answer the following questions.

Introduction

1. What hurricane hit Honduras in 1998? Hurricane Mitch
2. What continent is Honduras located? North America
3. How much rain did Hurricane Mitch bring? 64 cm/25 in
4. Using the last sentence in paragraph 2 on page. 5, please describe (in your own words) a mudslide. Answers will vary
5. How many people died due to Hurricane Mitch? 11,000

Chapter 1 The Restless Air

6. Name at least one person whom is affected by the weather everyday.

   _____

7. Weather is what is happening in the air around you
8. What are the layers of the atmosphere?
   a. Trophosphere
   b. Stratosphere
   c. Mesosphere
   d. Thermosphere
   e. Exosphere
9. What powers weather? The sun heating the earth
10. What is climate? General pattern of weather over a long period of time
11. How do people get around in:
    a. Solomon Islands in the South Pacific Ocean canoes
    b. Greenland dogsleds

12. What instrument measure air temperature? thermometer
13. Does warm air rise or sink? rise
14. What leads to changes in the weather? Changes in air pressure
15. Answer the question from the orange box on page 11. Circle your answer.
    a. Quincy toward Indianapolis
    b. Indianapolis towards Quincy

Chapter 2: Water, Water Everywhere

16. What process turns liquid water to water vapor? Evaporation
17. What are the three processes of the water cycle? Evaporation, condensation, precipitation
18. What is a stationary front? When a cold front and a warm front meet but do not move
19. How do snowflakes form? Inside clouds when tiny ice crystals collide and stick together
20. What are the two factors in a blizzard? Falling snow and wind
21. How long do tornadoes usually last? Less than 10 minutes
22. If a hurricane is given the # of 5, what does that mean? It is the strongest hurricane