**Unit: Weather**

*Study Guide*

Define each vocabulary word on a separate piece of paper or index card.

<table>
<thead>
<tr>
<th>Weather</th>
<th>Visibility</th>
<th>High pressure system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate</td>
<td>Wind</td>
<td>Air mass</td>
</tr>
<tr>
<td>Temperature</td>
<td>Humidity</td>
<td>Jet stream</td>
</tr>
<tr>
<td>Wind chill</td>
<td>Dew point</td>
<td>Weather fronts</td>
</tr>
<tr>
<td>Heat index</td>
<td>Barometric pressure</td>
<td>Isotherm map</td>
</tr>
<tr>
<td>Precipitation</td>
<td>Meteorologists</td>
<td>Isobar map</td>
</tr>
<tr>
<td>Sky conditions</td>
<td>Weather station model</td>
<td>Hazardous weather</td>
</tr>
<tr>
<td>UV index</td>
<td>Low pressure system</td>
<td>Hurricane</td>
</tr>
</tbody>
</table>

*There is a website that will make vocab cards for you. All you have to do is cut them out. [http://www.kitzkikz.com/flashcards/](http://www.kitzkikz.com/flashcards/)*

What causes weather?

*The interaction of air, water, and the sun cause weather.*

What is the Sun’s role in weather?

*The sun is the driving force of weather. It is responsible for precipitation, temperature and wind.*

How does weather impact us humans?

- What we wear
- How we move
- Our economy
- Our health
- Our daily activities
- In short, nearly every aspect of human activity

What is the difference between quantitative and qualitative?

*Quantitative is describing weather by using numbers (ex: temperature) and qualitative is describing weather by using descriptive language (ex: cloudy).*

What are all the different forms of precipitation?

*Rain, snow, hail, and sleet*

What is meteorology and what kind of scientist study it?

*Meteorology is the study of weather and climate. The type of scientist that studies meteorology is meteorologist.*
Fill in the table below while using the weather station model to the right.

<table>
<thead>
<tr>
<th>Cloud Cover</th>
<th>Mostly Cloudy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>15 knots, SW</td>
</tr>
<tr>
<td>Temperature</td>
<td>28°</td>
</tr>
<tr>
<td>Present Weather</td>
<td>Snow</td>
</tr>
<tr>
<td>Visibility</td>
<td>½ mile</td>
</tr>
<tr>
<td>Dew Point</td>
<td>27°</td>
</tr>
<tr>
<td>Precipitation</td>
<td>¼ inch</td>
</tr>
<tr>
<td>Barometric Pressure</td>
<td>1019.6 ppm</td>
</tr>
<tr>
<td>Pressure Trend</td>
<td>+19, rising</td>
</tr>
</tbody>
</table>

Draw a weather station model that shows all the information that is in the table below.

<table>
<thead>
<tr>
<th>Cloud Cover</th>
<th>Clear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>25 knots, NE</td>
</tr>
<tr>
<td>Temperature</td>
<td>78°</td>
</tr>
<tr>
<td>Present Weather</td>
<td>Sunny</td>
</tr>
<tr>
<td>Visibility</td>
<td>10 miles</td>
</tr>
<tr>
<td>Dew Point</td>
<td>65°</td>
</tr>
<tr>
<td>Precipitation</td>
<td>½ inch</td>
</tr>
<tr>
<td>Barometric Pressure</td>
<td>1023.4 ppm</td>
</tr>
<tr>
<td>Pressure Trend</td>
<td>+5, rising</td>
</tr>
</tbody>
</table>

Draw and color the symbol for a high pressure system. What kind of weather would we expect if we were in a high pressure system?

**H**

Associated with cool, dry air, sunny skies, fair weather conditions and light winds.

Draw and color the symbol for a low pressure system. What kind of weather would we expect if we were in a low pressure system?

**L**

Associated with warm and humid air, cloudy skies and usually bring stormy weather with strong winds.
What is the Coriolis effect and how does it affect the Northern and Southern Hemisphere?

Because the Earth rotates, it causes the wind to move in certain ways. In the Northern Hemisphere, winds blow/spiral clockwise and in the Southern Hemisphere, winds blow/spiral counterclockwise.

What are the 4 types of factors that help us classify the air masses? What do they each mean?

- **Polar air masses** – air masses that form near the poles
- **Tropical air masses** – air masses that form near the equator
- **Continental air masses** – air masses that form over land
- **Marine air masses** – air masses that form over water

What are the 4 different types of air masses?

- **Continental Polar**
- **Continental tropical**
- **Maritime Polar**
- **Maritime Tropical**

Draw, color and label the 4 different types of weather fronts. What does each front do?

<table>
<thead>
<tr>
<th>Cold Front</th>
<th>Warm Front</th>
<th>Occluded Front</th>
<th>Stationary Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cold Temps</td>
<td>- Warm Temps</td>
<td>- Moving boundary</td>
<td>- Nonmoving boundary “STEADY”</td>
</tr>
<tr>
<td>- A lot of precipitation</td>
<td>- Little amount precipitation</td>
<td>- When a cold front catches up with a warm front OR vice versa</td>
<td></td>
</tr>
<tr>
<td>o Rain</td>
<td>o Rain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Snow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 2 types of storms: snow storms &amp; thunderstorms</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

What is the name of the lines that you draw on an Isotherm map?

**Isotherm lines**

What is the name of the lines that you draw on an Isobar map?

**Isobars**
Make the Isotherm and Isobar maps below. Label each type of map.

Are Isotherm lines and isobars allowed to cross? Why or why not?
No, the lines are NEVER allowed to cross because one area can ONLY have one temperature or one kind of air pressure.

What does it mean if the lines are close together?
On an Isotherm map, it means that the temperature is changing quickly.
On an Isobar map, it means that the air pressure is changing quickly.

What are the 3 main groups of clouds and where can you find them?
Cirrus clouds – high clouds, found above 18,000 meters
Alto clouds – middle clouds, found between 6,000 – 20,000 meters
Stratus clouds – low clouds, found at 6,000 meters or below

What are the 8 types of clouds?
Cirrus clouds, Cirrocumulus clouds, Cirrostratus clouds, Altocumulus clouds, Altostratus clouds, Stratus clouds, Stratocumulus clouds, and Nimbostratus clouds

Why are vertical clouds called vertical clouds? What are these 3 types of clouds?
The clouds grow vertically in the sky. The 3 different vertical clouds are Cumulus clouds, Cumulonimbus clouds and fog.

Which cloud is known as the “rain clouds” or “snow clouds”?
Nimbostratus clouds

Which cloud brings thunderstorms or other hazardous weather?
Cumulonimbus clouds
What are the 2 weather extreme phases? How are they different?

El Nino – the “warm phase”, the surface temperature of water becomes warmer-than-normal in the central and western Pacific Ocean near the equator. They often lead to a low pressure system in the Northwest Pacific Ocean.

La Nina – the “cold phase”, the surface temperature of water becomes colder-than-normal in the central western Pacific Ocean near the equator. They often lead to a high pressure system in the Northwest Pacific Ocean.

What are all the different kinds of hazardous weather?

Thunderstorms, tornados, hurricanes, ice storms, blizzards, flash floods, fog, dust storms, monsoons and drought

What is a hurricane also known as?

A large tropical storm called a tropical cyclone.

How many stages are there to the formation of a hurricane? Put the stages in order from the beginning to end.

There are 4 stages to the formation of a hurricane: Tropical Disturbance, Tropical Depression, Tropical Storm, Hurricane.

How many categories are there during a hurricane? How do we classify each category?

There are 5 categories to a hurricane. They are categorized by the wind speed of the hurricane.

What do climate and weather have in common?

Both have temperatures, precipitation, wind and amount of sunlight of a region.

What is the difference between climate and weather?

Climate is the long-term conditions a region and weather is the short-term conditions of a region. Climate changes from year to year or decade to decade. Weather changes from minute to minute or day to day.

Label the parts of the water cycle below. Tell me about each part, what do they do?

**Precipitation**
Water droplets fall from the atmosphere in the form of rain, sleet, snow or hail.

**Transpiration**
The passage of water vapor from a plant to the atmosphere.

**Evaporation**
The process that occurs when water changes from a liquid to a gas, cause by heat.

**Condensation**
The cooling of water in the atmosphere, changing from a gas to a liquid.

**Runoff**
Rainfall that is not absorbed by soil and travels to the oceans.
Which gas is in the atmosphere does the infrared radiation bounce off of? What does it do to the gas? What would happen if that gas were no longer in the atmosphere?

- The gas that is in the atmosphere that the infrared radiation bounces off of is carbon dioxide.
- The infrared radiation makes the carbon dioxide warm up in the atmosphere.
- If there were no more carbon dioxide in the atmosphere, the temperatures on Earth would start to drop and get colder.

Carbon dioxide is known as what kind of gas? List some ways that carbon dioxide can get into the atmosphere?

Carbon dioxide is known as a greenhouse gas. Some ways that CO₂ gets into our atmosphere is by natural events like volcanoes erupting or forest fires, or us human driving our cars, burning fossil fuels and making more factories that pollute our atmosphere.

Carbon dioxide is part of what event that is warming the Earth?

CO₂ is part of global warming.