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| **Objective/Question:** | **Location:** | **Website(s):** | **Vocabulary Terms:** | **Notes:** |
| ***Weather and Climate*** |  |  |  |  |
| **1. [Describe** how the sun warms the Earth and **explain** how the sun affects weather]: “Sunlight is the driving force behind all weather and climate.” Explain the reason for this statement. What four elements of weather are included on a weather map? | Page 364-365; 370-371; 388 | Video: NASA | The Ocean: A Driving Force for Weather and Climate https://www.youtube.com/watch?v=6vgvTeuoDWY | \*insolation  \*equator  \*global winds | \*Without the Sun, Earth would be an icy rock unable to support life  \*Sunlight carries energy, which warms up the Earth and is the driving force behind all our weather and climate  \*Insolation does not warm all places on Earth equally  \*Where the heating is most pronounced, the warm air is more buoyant than the cooler air surrounding it, and tends to float upwards: soaring birds and glider pilots seek such "thermal currents" and allow themselves to be carried upwards by them.  \*This buoyancy is the basic process responsible for weather.  \*Air can flow, and thus carry its heat from one place to another. That is what produces our weather.  \*Addition of water vapor influence produces rain, hurricanes, etc.  \*Solar heat warms the huge air masses that comprise large and small weather systems.  \*Global winds blow because sunlight heats near Earth’s equator more than it heats near Earth’s poles |
| **2. [Explain** the difference between weather and climate]: Why don’t changes in weather ALWAYS result in climate changes for Earth? Identify 5 factors that can affect climate. | Pages 408-412 | <http://oceanservice.noaa.gov/facts/weather_climate.html> | \*weather  \*climate | \*Weather describes the conditions you observe on a particular day and time  \*Climate is the average weather of a place over time and has a big effect on the food we eat, the energy we use, homes we live in  \*Climate can even affect our health, from sunburn to allergies to respiratory illnesses.  \*Factors that affect weather include temperature, wind, and cloud cover  \*The 5 factors that affect the climate of an area are: distance from water; ocean currents; mountain ranges; winds; altitude |
| **3. [Describe** how climate affects the weather]: As Earth’s climate has warmed, what are some changes in weather that have been noticed? |  | <http://news.nationalgeographic.com/news/2013/01/pictures/130115-climate-change-superstorm-atmosphere-science/>  <http://www.ecy.wa.gov/climatechange/extremeweather_more.htm> |  | \*Rising global temperatures can lead to changes in weather such as: windstorms, droughts, and storms with extreme rain or snow  \* Carbon dioxide (CO2) from cars, industries and power plants trap heat near the earth's surface. More heat means more energy.  \*Adding so much energy to the atmosphere creates the potential for more extremes in weather |
| **4. [Define** a weather front and its impact on weather and **explain** the relationship of humidity and air pressure to weather changes]: How do fronts affect weather in an area? What weather difference are seen with low-pressure and high-pressure systems? | Pages 384-387 | <https://nc-climate.ncsu.edu/edu/k12/.fronts>  <http://comingbackalive.com/fronts.html>  <http://www.eduplace.com/science/hmxs/es/pdf/5rs_3_8-4.pdf> | \*air mass  \*front  \*air mass source regions (name and know location using map on page 384)  \*high-pressure system  \*low-pressure system | \*A front is where two air masses with different temperatures or humidity levels meet  \*Fronts usually result in stormy weather  \*Fronts can cause sharp temperature changes over a relatively short distance, change in moisture content, rapid shifts in wind direction, pressure changes, clouds and precipitation patterns  \*A cold front forms when a cold air  mass pushes under a warm air mass, forcing the warm  air to rise. Thunderheads can form as the moisture in the warm air mass rises, cools, and  condenses.  \*A warm front forms when a moist, warm  air mass slides up and over a cold air mass. As the warm air mass rises, it condenses into a broad area of clouds. A warm front brings gentle rain or light snow, followed by warmer, milder weather.  \* The entire atmosphere surrounding Earth is in constant motion caused by the uneven heating effect of the sun due to the spin of the Earth on its axis as it orbits the Sun. This causes the atmosphere to be composed of distinct air masses that have different temperatures, different amounts of moisture, different atmospheric pressures. |
| **5. [List** the types of severe weather and their causes]: What causes thunderstorms? How do hurricanes and tornadoes form? | Pages 394-402 | <http://www.weatherwizkids.com/weather-tornado.htm> |  | \*Under the right conditions a thunderstorm can turn into a tornado  \*Warm air moves upward in a thunderhead, creating an area of low pressure which moves air inward and upward  \*From the ground, the shape of the cloud looks like a funnel  \*When the tip of the funnel cloud touches the ground it becomes a tornado  \*Thunderstorms can also turn into tropical storms, which have rotating winds with low pressure at its center  \*Hurricanes form when wind speed of the storm reaches over 119 km/h (74 mph)  \*They form near the equator where ocean evaporates more readily and the air pressure lowers even more  \*Surrounding high pressure air moves into the area of low pressure and causes rotating winds  \*The hole is the center of the low pressure area and is referred to as the “eye” |
| **Pages:** 364-365; 370-371; 384-388; 394-402; 408-412 |  |  |  |  |