**LEARNING ACTIVITY SHEET IN SCIENCE 9**

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| Name of Learner; | JOHN RUSSEL JANDONERO | Score: |  |
| Grade and Section: | GRADE 9 – TAE | Week & Date: |  |

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| **Title of the Topic:** | **Climate** | | |
| **Most Essential Learning Competency:** | | **Code:** | **S9ES-IIIf-31** |
| * Describe certain climatic phenomena that occur on a global | | | |
| **I. Concept Notes: (30 points)** *(Contents needed for the learners to understand the topic. Brief discussion of the lesson, if possible cite examples)* | | | |
| Contains the following topics:   * Factors affecting climate * Global warming * Cause and effect of climate change * El Nino and La Nina   **FACTORS AFFECTING CLIMATE**  **Elevation or Altitude effect climate**  Normally, climatic conditions become colder as altitude increases. “Life zones” on a high mountain reflect the changes, plants at the base are the same as those in surrounding countryside, but no trees at all can grow above the timberline. Snow crowns the highest elevations.  **Prevailing global wind patterns**  There are 3 major wind patterns found in the Northern Hemisphere and also 3 in the Southern Hemisphere. These are average conditions and do not essentially reveal conditions on a particular day. As seasons change, the wind patterns shift north or south. So does the intertropical convergence zone, which moves back and forth across the Equator. Sailors called this zone the doldrums because its winds are normally weak.  Latitude and angles of the suns rays. As the Earth circles the sun, the tilt of its axis causes changes in the angle of which sun’s rays contact the earth and hence changes the daylight hours at different latitudes. Polar regions experience the greatest variation, with long periods of limited or no sunlight in winter and up to 24 hours of daylight in the summer.  **Topography**  The Topography of an area can greatly influence our climate. Mountain ranges are natural barriers to air movement. In California, winds off the Pacific ocean carry moisture-laden air toward the coast. The Coastal Range allows for some condensation and light precipitation. Inland, the taller Sierra Nevada range rings more significant precipitation in the air. On the western slopes of the Sierra Nevada, sinking air warms from compression, clouds evaporate, and dry conditions prevail.  **Effects of Geography**  The position of a town, city or place and its distance from mountains and substantial areas of water help determine its prevailing wind patterns and what types of air masses affect it. Coastal areas may enjoy refreshing breezes in summer, when cooler ocean air moves ashore. Places south and east of the Great Lakes can expect “lake effect” snow in winter, when cold air travels over relatively warmer waters.  In spring and summer, people in Tornado Alley in the central United States watch for thunderstorms, these storms are caused where three types of air masses frequently converge: cold and dry from the north, warm and dry from the southwest, and warm and moist from the Gulf of Mexico - these colliding air masses often generate tornado storms.  **Surface of the Earth**  Just look at any globe or a world map showing land cover, and you will see another important factor which has a influence on climate: the surface of the Earth. The amount of sunlight that is absorbed or reflected by the surface determines how much atmospheric heating occurs. Darker areas, such as heavily vegetated regions, tend to be good absorbers; lighter areas, such as snow and ice-covered regions, tend to be good reflectors. The ocean absorbs and loses heat more slowly than land. Its waters gradually release heat into the atmosphere, which then distributes heat around the globe.  **Climate change over time**  Cold and warm periods punctuate Earth’s long history. Some were fairly short; others spanned hundreds of thousands of years. In some cold periods, glaciers grew and spread over large regions. In subsequent warm periods, the ice retreated. Each period profoundly affected plant and animal life. The most recent cool period, often called the “Little Ice Age,” ended in western Europe around 1850.  Since the turn of the 20th century, temperatures have been rising steadily throughout the world. But it is not yet clear how much of this global warming is due to natural causes and how much derives from human activities, such as the burning of fossil fuels and the clearing of forests.  **GLOBAL WARMING**  Global warming is expected to have far-reaching, long-lasting and, in many cases, devastating consequences for planet Earth.  Global warming, the gradual heating of Earth's surface, oceans and atmosphere, is caused by human activity, primarily the burning of fossil fuels that pump carbon dioxide (CO2), methane and other greenhouse gases into the atmosphere.  Despite political controversy about climate change, a major report released Sept. 27, 2013, by the Intergovernmental Panel on Climate Change (IPCC) stated that scientists are more certain than ever of the link between human activities and global warming. More than 197 international scientific organizations agree that global warming is real and has been caused by human action.  **CAUSE AND EFFECT OF CLIMATE CHANGE**  Humans are increasingly influencing the climate and the earth's temperature by burning fossil fuels, cutting down forests and farming livestock. This adds enormous amounts of greenhouse gases to those naturally occurring in the atmosphere, increasing the greenhouse effect and global warming.  **EL NINO AND LA NINA**  ***El Nino***  During El Nino, trade winds weaken. Warm water is pushed back east, toward the west coast of the Americas.  El Nino means Little Boy, or Christ Child in Spanish. South American fishermen first noticed periods of unusually warm water in the Pacific Ocean in the 1600s. The full name they used was El Nino de Navidad, because El Nino typically peaks around December.  El Nino can affect our weather significantly. The warmer waters cause the Pacific jet stream to move south of its neutral position. With this shift, areas in the northern U.S. and Canada are dryer and warmer than usual. But in the U.S. Gulf Coast and Southeast, these periods are wetter than usual and have increased flooding.  El Nino also has a strong effect on marine life off the Pacific coast. During normal conditions, upwelling brings water from the depths to the surface; this water is cold and nutrient rich. During El Nino, upwelling weakens or stops altogether. Without the nutrients from the deep, there are fewer phytoplankton off the coast. This affects fish that eat phytoplankton and, in turn, affects everything that eats fish. The warmer waters can also bring tropical species, like yellowtail and albacore tuna, into areas that are normally too cold.  ***La Nina***  La Nina means Little Girl in Spanish. La Nina is also sometimes called El Viejo, anti-El Nino, or simply "a cold event." La Nina has the opposite effect of El Nino. During La Nina events, trade winds are even stronger than usual, pushing more warm water toward Asia. Off the west coast of the Americas, upwelling increases, bringing cold, nutrient-rich water to the surface.  These cold waters in the Pacific push the jet stream northward. This tends to lead to drought in the southern U.S. and heavy rains and flooding in the Pacific Northwest and Canada. During a La Nina year, winter temperatures are warmer than normal in the South and cooler than normal in the North. La Nina can also lead to a more severe hurricane season.  During La Nina, waters off the Pacific coast are colder and contain more nutrients than usual. This environment supports more marine life and attracts more cold-water species, like squid and salmon, to places like the California. | | | |
| **II. Learning Activities:** | | | |
| 1. **Learning Activity 1:**   **1A: Long Term or Short Term (35 points)**  Direction: EXAMINE the pictures below. Write **X** under the column of **Climate if it shows** climate, (a long – term atmospheric condition of a certain area. And write  **⁄** under the column **Weather if it describes weather**( a short term of atmospheric condition of a certain area  ( typically within a week or less). Write your reason/s why in the column **Reason/s**.  Table 1   |  |  |  |  | | --- | --- | --- | --- | | Picture | **CLIMATE** | **WEATHER** | **Reason/s** | | **Source:** [Free Images : landscape, air, wind, jungle, weather, dust, terrain, savanna, climate, windy, sandstorm, ecosystem, cyprus, wadi, screenshot, natural environment, arecales 4525x2545 - - 496973 - Free stock photos – PxHere pxhere.com](https://www.google.com/url?sa=i&url=https%3A%2F%2Fpxhere.com%2Fen%2Fphoto%2F496973&psig=AOvVaw3RgEZkiQxpuLVUro7O3wiS&ust=1597905048830000&source=images&cd=vfe&ved=2ahUKEwjwzOqn0qbrAhXCIaYKHYWyDtwQr4kDegQIARBy" \o "Free Images : landscape, air, wind, jungle, weather, dust, terrain,  savanna, climate, windy, sandstorm, ecosystem, cyprus, wadi, screenshot,  natural environment, arecales 4525x2545 - - 496973 - Free stock photos -  PxHere" \t "_blank)  1. A windy weekend |  | **/** | Because short term only last for a week or less. Weather is the condition. Weather is the state of the atmosphere, describing for example the degree to which it is hot or cold, wet or dry, calm or stormy, clear or cloudy. | | Source:[Free photo Sky Sun Blue Dark Clouds Rays Weather - Max Pixelmaxpixel.net](https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.maxpixel.net%2FSky-Sun-Blue-Dark-Clouds-Rays-Weather-1365325&psig=AOvVaw0vqksr7of-3Q8z3pEJXh5f&ust=1597905446192000&source=images&cd=vfe&ved=2ahUKEwjO06fl06brAhWKG6YKHVkrD1oQr4kDegUIARCIAQ" \o "Free photo Sky Sun Blue Dark Clouds Rays Weather - Max Pixel" \t "_blank)  2. Dark cloudy sky yesterday. |  | **/** | Because short term only last for a week or less. Weather is the condition. Weather is the state of the atmosphere, describing for example the degree to which it is hot or cold, wet or dry, calm or stormy, clear or cloudy. | | **Source:** [Free Images : atmosphere, weather, storm, lightning, thunder, thunderstorm, radius, relampago 4928x3264 - - 756102 - Free stock photos – PxHere pxhere.com](https://www.google.com/url?sa=i&url=https%3A%2F%2Fpxhere.com%2Fen%2Fphoto%2F756102&psig=AOvVaw0myCv1uiSjxW-mFoHm2Jxf&ust=1597905894723000&source=images&cd=vfe&ved=0CFoQr4kDahcKEwigppbQ1abrAhUAAAAAHQAAAAAQBQ" \o "Free Images : atmosphere, weather, storm, lightning, thunder, thunderstorm,  radius, relampago 4928x3264 - - 756102 - Free stock photos - PxHere" \t "_blank)  3. Thunderstorms during afternoon |  | **/** | Because short term only last for a week or less. Weather is the condition. Weather is the state of the atmosphere, describing for example the degree to which it is hot or cold, wet or dry, calm or stormy, clear or cloudy. | | **Source:** [woman and girl standing while holding umbrella during rainy day free image | Peakpx peakpx.com](https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.peakpx.com%2F623061%2Fwoman-and-girl-standing-while-holding-umbrella-during-rainy-day&psig=AOvVaw1Y8iw3KBfks3MgBE4gBXAx&ust=1597908236584000&source=images&cd=vfe&ved=0CAYQr4kDahcKEwjQqtqq3qbrAhUAAAAAHQAAAAAQAg" \o "woman and girl standing while holding umbrella during rainy day free image  | Peakpx" \t "_blank)  4. Rainy days during the month of May to July | **X** |  | Because it lasts for a month | | **Source:** [El nino soil | Pikrepo pikrepo.com](https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.pikrepo.com%2Ffpxnk%2Fel-nino-soil&psig=AOvVaw0ntJTBkNSXXZeOso_FvbZw&ust=1597908612795000&source=images&cd=vfe&ved=2ahUKEwjZ3aHL36brAhVB6pQKHQ5QAbEQr4kDegUIARCzAQ" \o "El nino soil | Pikrepo" \t "_blank)  5. El Niňo | **X** |  | El Nino can last for 9 – 12 months. | | **Source:** [File:Typhoon Haiyan 2013 making landfall.gif - Wikimedia Commons commons.wikimedia.org](https://www.google.com/url?sa=i&url=https%3A%2F%2Fcommons.wikimedia.org%2Fwiki%2FFile%3ATyphoon_Haiyan_2013_making_landfall.gif&psig=AOvVaw0SicBaid9qw3n9G1cHrsBo&ust=1597908935612000&source=images&cd=vfe&ved=2ahUKEwiY-Jjl4KbrAhURg5QKHRSUDKoQr4kDegUIARC4AQ" \o "File:Typhoon Haiyan 2013 making landfall.gif - Wikimedia Commons" \t "_blank)  6. Typhoon Haiyan (Yolanda) |  | **/** | Typhoon Haiyan (Yolanda) only lasted for less than a week | | **Source:** <https://www.flickr.com/photos/eu_echo/7842289456>  7. La Niňa | **X** |  | La Niňa can last for 9 month to 1 year. | | **Source:** [Nature Rain Forest Doi Inthanon Free Stock Photo - Public Domain Pictures publicdomainpictures.net](https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.publicdomainpictures.net%2Fen%2Fview-image.php%3Fimage%3D344854%26picture%3Dnature-rain-forest-doi-inthanon&psig=AOvVaw3eF7_0pVBumHso1K5U6dJJ&ust=1597910029843000&source=images&cd=vfe&ved=0CLoBEK-JA2oXChMIkM_aiuWm6wIVAAAAAB0AAAAAEAQ" \o "Nature Rain Forest Doi Inthanon Free Stock Photo - Public Domain Pictures" \t "_blank)  8. Rain Forest | **X** |  | Because of the location | | Source: [Free photo: algeria, sahara, desert, dunes, 4x4 | Hippopx](https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.hippopx.com%2Fen%2Falgeria-sahara-desert-dunes-4x4-240557&psig=AOvVaw3bK8V1cr0k4MwIdIRS_01n&ust=1597910394561000&source=images&cd=vfe&ved=2ahUKEwjdjPCc5qbrAhU8zIsBHUoRAa0Qr4kDegUIARDXAQ" \o "Free photo: algeria, sahara, desert, dunes, 4x4 | Hippopx" \t "_blank)  [hippopx.com](https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.hippopx.com%2Fen%2Falgeria-sahara-desert-dunes-4x4-240557&psig=AOvVaw3bK8V1cr0k4MwIdIRS_01n&ust=1597910394561000&source=images&cd=vfe&ved=2ahUKEwjdjPCc5qbrAhU8zIsBHUoRAa0Qr4kDegUIARDXAQ" \o "Free photo: algeria, sahara, desert, dunes, 4x4 | Hippopx" \t "_blank)  9. Sahara Desert (Northern Africa) | **X** |  | Because of the location |   Guide Questions:  1. What is Climate? Climate is the average weather in a place over many years.  2. What is Weather? Weather refers to day-to-day temperature and precipitation activity.  3. The difference between climate and weather is that, Climate is the weather patterns of a place over a long period of time while weather is the condition of the atmosphere over a short period of time  1B: Poem! **(25 points)**  Direction: Make a poem about weather. Follow the suggested steps below.  Title: “My Weather Poem”  First line: Give at least four types of weather.  Second line: Three “ing” words you do during summer time.  Third line: Two adjectives that describe weather and climate.  Fourth line: Ask one question about weather and climate.  Last line: Two importance why you need to study weather and climate.  Windy, sunny, rainy and cloudy.  Playing, running, singing while watching the clouds go by.  Weather and climate is hot and cold.  What is the difference of climate and weather.  We need to study these to know how far sea levels will rise.  We also need to study to solve global warming. | | | |
| 1. Learning Activity 2:   **2A: Short Answer (40 points)**  **Objective:** Explain climate and weather pattern; Share how climate change affects once lifestyle;  **Direction:** Answer the following questions:   1. What are the factors affecting climate? (5 points)  * Latitude. It depends on how close or how far it is to the equator. ... * Ocean currents. Certain ocean currents have different temperatures. ... * Wind and air masses. Heated ground causes air to rise which results in lower air pressure. ... * Elevation. The higher up you are, the colder and drier it will be. ... * Relief.  1. Why do we experience weather changes? (3 points)   Seasonal changes are due to the Earth revolving around the sun.   1. How do we contribute to global warming? (3 points)   The vehicles you see on the road, air and water get power through fossil fuels. When they burn these, it releases a number of pollutants including carbon.   1. How does climate change affect our lives and the Earth’s land scape? (3 points)   The increased carbon dioxide levels associated with climate change can also drive ecosystem change, acting as fertilizer for vegetation growth and consequently causing a 'greening effect' across Earth.   1. Alleviating the negative effects of climate change involves energy efficient practices. List three things you do that are not energy-efficient. Beside each practices, write down a commitment to reverse this practices. (6 points)  * Leaving the faucet on while washing the dishes - Turn off the faucet when not in use * Leaving the cellphone charger plugged when not in use - Unplug when not in use * Leaving the lights on when not in use - Turn of the light when its not in use  1. Draw a flowchart showing the various effects of climate change, including its personal impact on you. (10 points)   CLIMATE CHANGE  RISING OF TEMPERATURE  FOREST FIRE  RISING OF SEA LEVEL  DELAYED FLIGHTS  HEALTH RISKS   1. Give three examples of the impact of global warming on biodiversity. (3points)  * Warmer temperatures will also expand the range of many disease-causing pathogens * Increase of temperature around the world * Reduction in Arctic Sea Ice  1. Differentiate global warming from climate change. (4 points)   "Global Warming" is a gradual increase in the overall temperature of the earth's atmosphere generally attributed to the greenhouse effect caused by increased levels of carbon dioxide, chlorofluorocarbons, and other pollutants. While “Climate change” a change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.   1. Reflect this message and explain it through the context of climate change: “If we live as if it matters, and it doesn’t matter, then it doesn’t matter. If we live as if it doesn’t matter, and it matters, then it matters.” (5 points)   If you care about global warming and you know the risks, and what your doing contributes to global warming, then you don’t care about the dangers. And if you don’t care about global warming, but you did do something to prevent it from being worse, then you care for it. | | | |
| 1. Learning Activity 3:   **3A: Ad Campaign(Group task) (50 points)**  Instruction: Create a 3-minutes minimum ad campaign about climate change in how it affects the livelihood, culture, environment, religion and socio-economic status of the people in Earth. In your ad campaign cite at least 5 activities that reduces the risks and lessens the effects of climate change. Submit the video in the video link below:  <https://drive.google.com/drive/folders/1cxWxdEqODlNIruQTZqQ3vtcrC7wz4yGB?usp=sharing>  Deadline: April 30, 2021 at 5:00 pm  Evaluation | | | |
| **III. Reflection: (10 points)** | | | |
| I have learned a lot about climate, the factors that affect it, meaning of global warming, the cause and effect of climate change and a lot the difference and effects of El Nino and La Nina to us.  There are many factors that affects climate but there are 6 major ones:  Elevation or Altitude effect climate, Normally, climatic conditions become colder as altitude increases. “Life zones” on a high mountain reflect the changes, plants at the base are the same as those in surrounding countryside, but no trees at all can grow above the timberline. Snow crowns the highest elevations.  Prevailing global wind patterns, there are 3 major wind patterns found in the Northern Hemisphere and also 3 in the Southern Hemisphere. These are average conditions and do not essentially reveal conditions on a particular day. As seasons change, the wind patterns shift north or south.  Topography, The Topography of an area can greatly influence our climate. Mountain ranges are natural barriers to air movement. In California, winds off the Pacific Ocean carry moisture-laden air toward the coast.  Effects of Geography, the position of a town, city or place and its distance from mountains and substantial areas of water help determine its prevailing wind patterns and what types of air masses affect it.  Surface of the Earth, the amount of sunlight that is absorbed or reflected by the surface determines how much atmospheric heating occurs.  Climate change over time, Cold and warm periods punctuate Earth’s long history. Some were fairly short; others spanned hundreds of thousands of years. In some cold periods, glaciers grew and spread over large regions.  Global warming is the gradual heating of Earth's surface, oceans and atmosphere, is caused by human activity, primarily the burning of fossil fuels that pump carbon dioxide (CO2), methane and other greenhouse gases into the atmosphere. The effects of global warming include rising of sea level, rising of temperature and wildfires. | | | |

Prepared by: **REYNA MAY E. DOLERA / Science teacher III**

Note: Submission of LAS2 (deadline regardless of the video project) will be on April 21, 2021.

Additional activity on lesson 2: climate and summative test will be posted in Edmodo.