Grade 8

Ch. 8 Lesson 5

Earth and Space Science

Page #	Question	Answer(s)	Links/Sources	Student Resources
309	What do you think triggers the leaves to change color and fall off?	*Students may predict that a change in temperature can signal the leaves to begin changing color.		
309	What triggers the leaves to begin growing in the spring?	*Students will likely predict temperature as well.		
309	Could you determine an area's climate if you had data about weather for a year? Explain.	*Sample answer: No. Climate is based on weather patterns gathered over 30 years or more. Inferences can be made about general climate conditions. Make copies of annual precipitation and temperature graphs for your area. Note: Why not let students research the weather data and make their own graphs that display the data they found. Take advantage of every opportunity to let students do the work of scientists.		
309	What patterns do you see in the data?	*Answers will vary depending on students' location.		
309	How would you adapt to climate that seems to be turning colder than what it used to?	Sample answer: I would start getting warmer clothing, I might not do as many activities outside during the winter, my family might start putting in different kinds of landscape plants around our yard.		
309	What kinds of changes might you expect to see in local plants and animal communities?	Sample answer: Some plants not adapted to colder climate may not survive well, whereas plants that need colder climate may start increasing numbers. Animals may start developing thick winter fur, some species that migrate may start to migrate earlier in the fall and return later in the spring. Species of insects that are familiar, may be replaced by species that are better adapted to cool climate.		
309	What is the climate like where you live?	Answers will vary depending on location. Make sure that students understand that climate includes more than temperature, but it includes amount and kind of precipitation, prevailing wind, and the frequency of storms and when they typically affect the area.		
309	Do you think the climate in your area is the same as it was 100 years ago? Why or why not.	Sample answer: Yes, the climate in our area has gotten warmer with less rainfall. Records from a century ago show cooler temperatures, higher rainfall and more snow in our region.		

310	Which cities will have the most variation in their climates?	Sample answer: Cities that are away from large bodies of water and those in the higher latitudes will have greater variation in their climates.		
310	Can you identify a city based on its climate?	Sample answer: Yes. By looking at the average temperature and range of temperature during the year, you can make a pretty good guess as to the latitude of the city and whether the city is at a high elevation of low elevation.		
311	Why do you think the climate of Egypt would be susceptible to famine?	*Sample answer: Most of Egypt is a desert climate and is more susceptible to drought, which can cause crop failure which would make it vulnerable to famine.		
311	How do the Sun's rays warm the Earth?	*Sample answer: The Sun's rays hit the equator at a more direct angle so the rays are condensed to a smaller area and heat it more. Areas to the north and south receive less direct rays, so the rays spread out and don't heat those areas as much.		
311	Why is Hawaii warm for much of the year?	*Weather is very consistent in Hawaii because of the high density of incident rays both in the summer and winter.		
311	How does the term *high density* relate to the rays on the globe?	*Sample answer: There are a lot of rays in a small volume of space.		
311	What does the word *incident* mean"	*One definition of the *incident* is to "fall upon or striking a surface."		
311	Why do no or very few light rays hit the North Pole for about six months of the year?	*Because the Earth is tilted and the North pole points away from the Sun.		
311	What can you conclude from your results?	Sample answer: The temperature at the equator is greater than it is at the pole.		
311	What do you think the are the similarities between your set-up and how the Earth is heated by the Sun?	Sample answer: The differences I the temperatures I observed on my model are somewhat similar to the differences in temperatures at the equator and at the poles.		
311	What other factors affect how the Sun warms different parts of Earth?	Sample answer: Differences in temperatures are related to atmospheric conditions, to elevation of the land, the topography of the land, how close the land is to large bodies of water, ocean currents, the dominant air masses that hang oven an area, and the distance between the Sun and Earth at different times of the year.		
311	Why is Hawaii warm and northern Canada cold for much of the year?	Sample answer: Hawaii is close to the equator and receives more high density incident rays. Norther Canada is closer to the North Pole and in the higher latitudes and subsequently receive less of the Sun's incident rays.		

311	What other areas have climates similar to Hawaii and norther Canada?	Sample answer: Similar to Hawaii - regions that are near the equator such as the Caribbean, the Pacific Islands, Central America. Similar to northern Canada - Alaska, Greenland, Iceland, northern Russia, northern Europe, northern Asia.		
311	What do those areas have in common?	They have similar latitudes.		
312	What is the elevation of an area that is near the ocean?	*Sample answer: 0 m or sea level.		
312	Give an area that is likely has a cool climate because of its elevation?	*Sample answer: the Rocky Mountains.		
312	Why does it rain near the top of the mountain?	*The air has cooled enough that it no longer can hold the water vapor inside it.		
312	How will this topographic feature affect climate?	*Sample answer: The topography causes the greatest rainfall to occur on the windward side of the mountain as the air is lifted up, the moisture cools and condenses and falls as precipitation. By the time air gets to the leeward side of the mountain, it has lost most of its moisture and there is not enough moisture left to fall as precipitation, resulting in a dryer climate.		
312	What things affect climate?	*Latitude, elevation, air masses, global winds, bodies of water, and topography?		
312	What factors most influences the climate in your region	*Answers will vary. For example, coastal locations may be influenced most by bodies of water.		
312	Why don't these areas get hotter over time?	*Global winds and ocean currents transfer the heat energy to other places.		
312	How does global warming affect climate?	*It causes an increase in temperatures and can alter typical weather patterns. Many of the impacts remain unknown.		
313	What characteristics are used to distinguish between climate zones?	*Temperature, precipitation, and latitude.		
313	Why is it necessary to further divide the three main climate zones in several smaller, more specific zones?	*Sample answer: Because each of the main climate zones have regions of consistent characteristics that differ slightly from other regions in the specific climate zone. These slight differences are the result of changing latitude, elevation and ocean currents.		
313	Does the size of the climate zones make sense?	*Explain that it evens out as Earth orbits the Sun. During part of the orbit, the northern hemisphere is tilted toward the Sun, and during the corresponding part of the orbit, the southern hemisphere is tilted toward the Sun. So each area receives the same amount of solar radiation over the course of one year.		

313	In which climate zone do you live?	Sample answer: Temperate zone. Note: Students in much of Alaska, northern Canada, southern Florida, the Bahamas do not live in the temperate zone.		
314	How do you think we can use the distribution of plants and animals to assess how climate zones are changing.	*We can look at plant and animal populations to see how they are changing. For example, sea turtles have lost their nesting areas because of beaches have changed due to the rise of sea levels. As a result, there is a decrease in the number of sea turtles.		
314	How does a changing climate affect life on Earth?	*Answers will vary depending on the climate students are focusing on. Sample answer: If the temperature in the polar zone increased, the ice mass would decrease due to snow melt and there would be less habitat for land animals. Note: Things have dramatically changed since the writing of the text. *The melting ice mass is now well documented and his having a dramatic impact on those animals who depend on the ecosystem of the ice pack, such as polar bears, seals, and whales. See link at left.	https://abcnews.go.com/International/melting-arctic-ice-catastrophic-effects-world-experts/story?id=81588333	
314	Do you think that the plants in the area have developed protective adaptations as well?	*Sample answer: Yes, the shallow roots of tundra allow them to use the meltwater that is just below the frozen material. They also grow close to the ground so as to not get blown away by strong arctic winds. Note: The question does not ask for an explanation of their "yes" or "no" answer. The information about plant adaptation is interesting, but is not necessary.		
314	What other animals might benefit from the ability to change colors within seasons?	*Answers will vary. Leave the question open for discussion. Accept reasonable answers and record them on the board. Note: Examples include - snowshoe hare, weasels, caribou, arctic lemmings, willow ptarmigan, and Siberian hamsters.		
315	How is this related to the definition of a biome?	*Sample answer: A biome is an area with distinct life forms and environmental conditions and factors..		
315	What adaptation does the camel have to live in its climate?	*Sample answer: To keep cool, camels have a thin layer of fur underneath their bellies to help lose heat. Camels have adapted to the heat by going for a long time without water. Many students may think camels store water in their humps, but this is a myth.	https://www.bbc.co.uk/bitesize/guides/zthcwmn/revision/6#:~:text=large%2C%20flat%20feet%20%2D%20to%20spread,little%20water%20through%20urination%20and	
	* Means the answer is found in the TE.			