

Assignment 3

Maxime CHAMBREUIL
McGill ID: 260067572
maxime.chambreuil@mail.mcgill.ca

Question 1: *Briefly discuss the consequences for the seasons if the Earth's tilt changed to 10 degrees (leaving all other orbital factors unchanged).*

If the Earth's tilt changed to 10 degrees (leaving all other orbital factors unchanged), then there wouldn't be such a big difference between seasons and it might be impossible for us to distinguish our 4 seasons. Furthermore, a smaller area at each pole would be in complete darkness or sunlight 24 hours a day, during winter or summer depending on the pole.

Question 2: *Identify 3 factors that inhibit dramatic changes in the temperature of large bodies of water.*

The evaporation (liquid to gas), the solidification (liquid to solid) and the convection (mix of water to uniformize the temperature) are 3 factors that inhibit dramatic changes in the temperature of large bodies of water.

Question 3: *In a northerly climate, how might an early snowcover affect the onset of cold winter temperatures? Why?*

The winter should be colder because the snow is a good heat insulator and a good emitter of solar radiation.

Question 4: *Explain how the range of daily temperatures would typically change if the height of the standard temperature measurement was decreased from its present 1.5 m height.*

During the day, the temperature should be greater if the measurement is done closer to the surface, and lower if it is above 1.5 m height. During the night, due to the radiation inversion factors, the temperature range should be lower if the measurement is done under 1.5 m height and greater above.

Question 5: *How would the annual temperature range at Montreal be expected to that of Mt. Tremblant? Why?*

The annual temperature range at Montreal would be expected to be lower than that of Mt. Tremblant, because the latitude and the altitude of Montreal are lower than the ones of Mt. Tremblant.

Question 6: *What colour would the sky mainly be on a planet with no atmosphere?*

On a planet without atmosphere, the sky would be white as all the wavelengths of the visible range would go to the surface without meeting any particles.

Question 7: *Why are raining clouds generally darker than non-raining ones ?*

Raining clouds are much darker than non-raining because they are thicker. So they absorb a lot more light from the sun.

Question 8: *Give 3 differences between the factors and conditions generating a rainbow and those generating a sundog.*

A sundog happens due to crystal presence in the atmosphere. A rainbow happens due to water drops and when there is not so much clouds in the atmosphere, so that sunlight can reach the rain. There cannot be any rainbow if all the sky is full of clouds.

Question 9: *A glass of water at room temperature would probably evaporate more or less rapidly in your house this week in January than it would during the summer. Explain.*

A glass of water at room temperature would evaporate less rapidly in your house this week in January than it would during the summer, because evaporation happens easier during the summer due to the fact that the air is drier and hotter.

Question 10: *If you considered relative humidity with respect to ice rather than the typical way of defining it with respect to liquid water, how would values of the 2 parameters compare for the same amount of water vapour in the atmosphere ? Why ?*