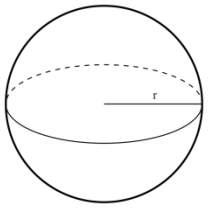
Name _____ Date _____ Period _____

HEATING THE ATMOSPHERE

Activity 1 - Different Surfaces

Purpose – observe how the temperature changes with different surfaces. Use the following procedures to complete this observation.

Materials – 1 transparent sphere with a green (forest) land disk, 1 transparent sphere with a white (Ice) land disk, 2 round stands, Rule, Timer, Thermometer, Lamp, and ring stand.

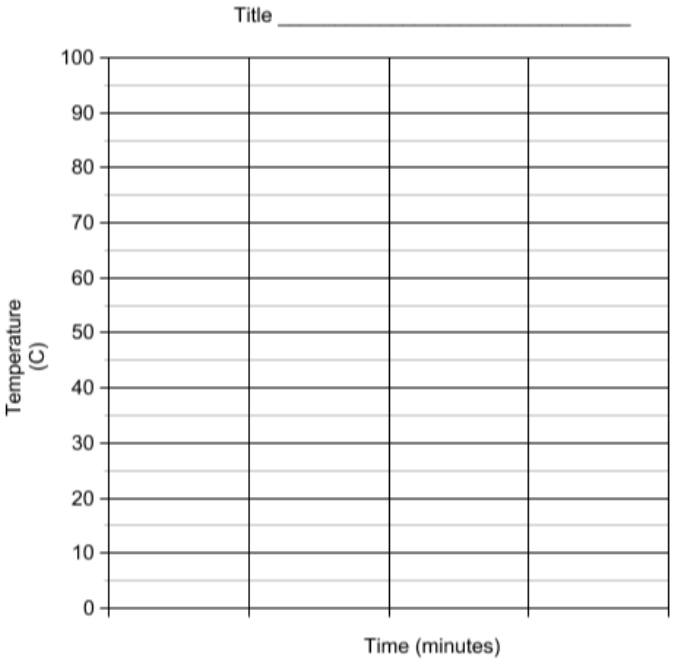


Procedures:

1. Place the thermometer into the top hole of each sphere and record the initial temperature inside each in the data table.
2. Set up the lamp using the ring stand making sure that is at least **1 ruler length** away from the spheres, but that the light from the lamp is **hitting the surfaces of each landscape disk equally**.
3. Record the temperature every minute for 10 minutes in the data table below. Make sure the thermometer is set to **Celsius**

Type of Surface	Surface Temperatures (°C)										
	Initial	**1 min**	**2 min**	**3 min**	**4 min**	**5 min**	**6 min**	**7 min**	**8 min**	**9 min**	**10 min**
White surface (Ice)											
Green Surface (Forest)											

4. Use the data to create a graph showing the results of the experiment



Ice (white disk) ☐

Forest (green disk) ☐

Analysis Questions

5. What pattern do you observe between the temperatures changes of the 2 spheres?

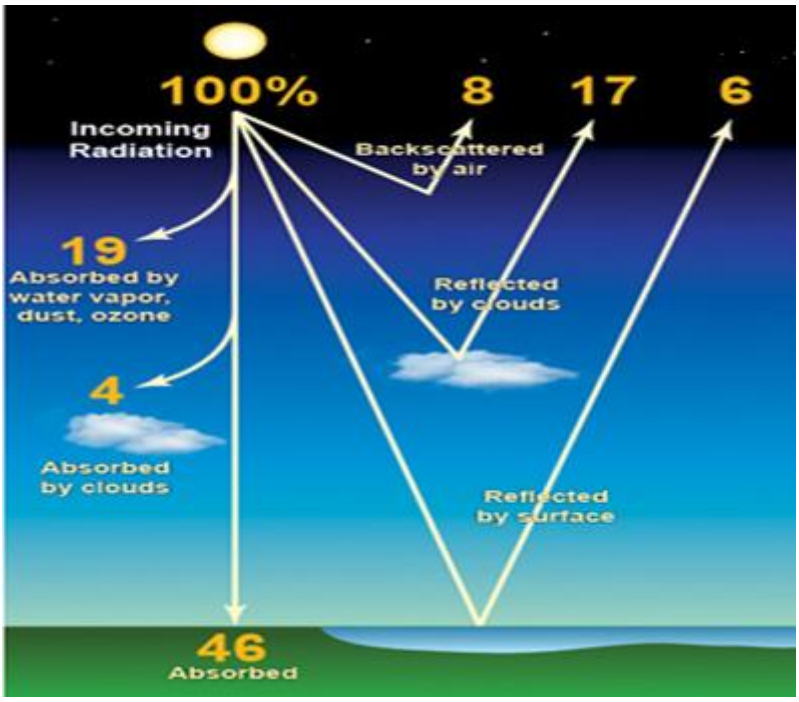
6. What could be causing these changes?

7. Which of the surfaces tested was darker in color?

8. Predict what you think would happen to temperatures on Earth, if most of the Earth's surface was covered in ice?

ACTIVITY 2 – HOW MUCH RADIATION?

Use the diagram to answer the following questions



9. Use the picture to complete the data table. Some boxes may remain empty after completing

Incoming Solar Energy				**Total**
	Clouds	**Land/Water Surfaces**	**Atmosphere**	
Energy Reflected				
Energy Absorbed				
Energy Scattered				
			Total Energy	

How much incoming solar radiation does Earth receive from the sun?

10. What do you think would happen if there were more clouds? Provide evidence from the image to support your answer.

11. What do you think would happen if the atmosphere was thinner and had fewer gases? Provide evidence from the image to support your answer.

12. What do you think would happen to the surface temperatures if the surface absorbed more incoming solar radiation?