



Atmosphere & Weather Name _____

Heating the Earth

Purpose: To illustrate how dark land surfaces, light land surfaces and water all heat at different rates.

MATERIALS:

| | | |
|---------------------------|------------------|--------------|
| Waterproof containers (3) | Thermometers (3) | Heat lamp |
| Water | Sand | Potting soil |

PROCEDURE:

1. Fill one container about half full with light sand, one with potting soil, and the third with water to the same level.
2. Place the thermometers upright into the sand and water, submerging the ball of the thermometer into the material.
3. Place the containers under the heat lamp so that they all get equal amounts of light rays from it. Make sure the thermometers are upright and not receiving direct light.
4. **Before you turn the light on**, take the initial (starting) temperature,
5. Turn the light on and measure the temperature of each material in Celsius every 5 minutes. Record.
6. After 20 minutes, turn off the light and record the falling temperatures for about 20 minutes.

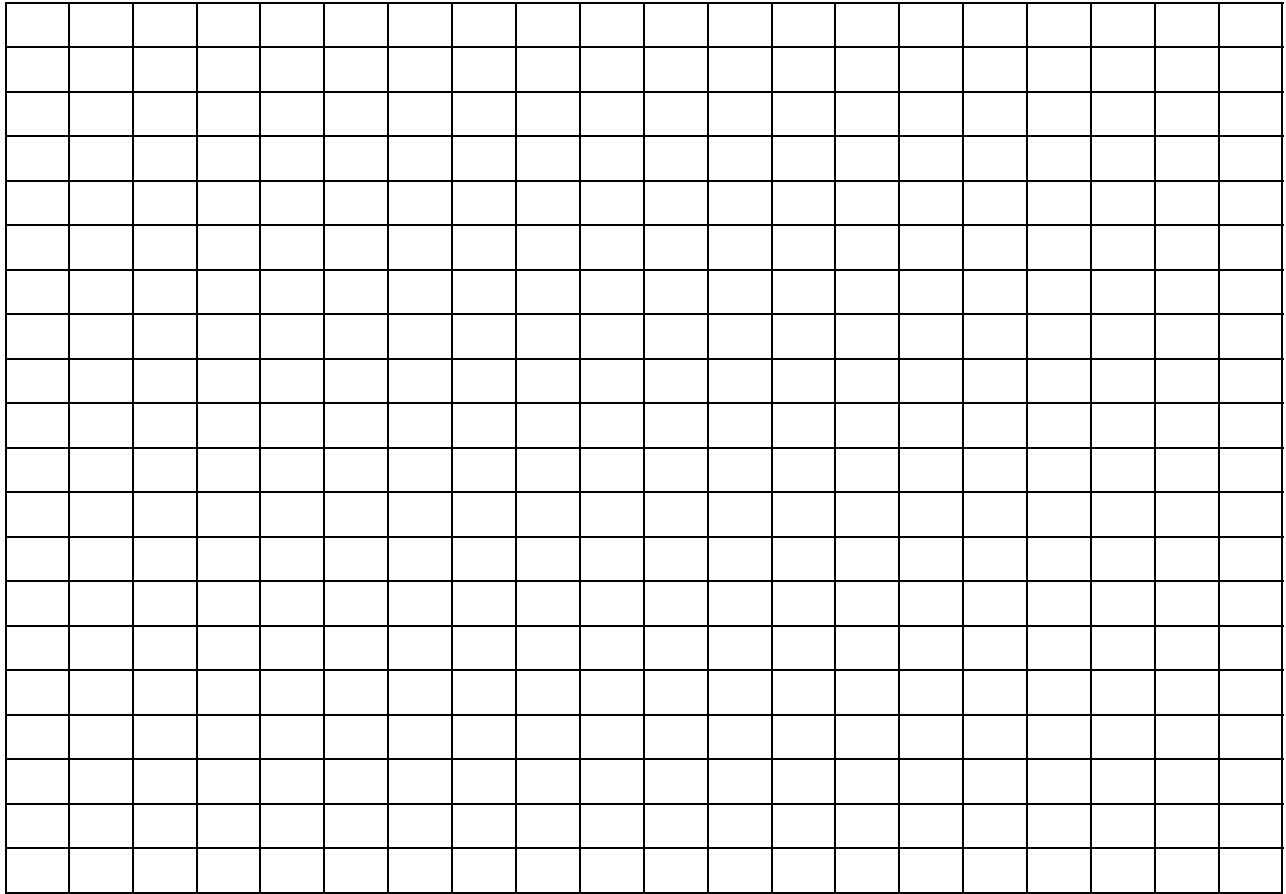
DATA:

| | Initial T | Warming Up | | | | Cooling Down | | | |
|---------|-----------|------------|----|----|----|--------------|----|----|----|
| Time | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| Water T | | | | | | | | | |
| Sand T | | | | | | | | | |
| Soil T | | | | | | | | | |

DATA ANALYSIS:

Make a TRIPLE line graph. Why? _____

Use a different color of map pencil for each substance measured. Make a key to show which color represents which substance. Remember **DRY MIX**.



What is the independent variable in this investigation? _____

What is the dependent variable in this investigation? _____

What relationship do you see between the variables?

Questions:

1. What can you conclude from these results? (Which material heats and cools the fastest/slowest?)

2. What do these results indicate about the heating of the Earth? (Does the Earth heat the same way all over?)

3. Think about it: What do you think would happen if the Earth were covered with over 70% land instead of water?
