Name _____ Date _____ Period _____ 98

# Collecting Solar Energy

## Activity 1 – Solar Oven Test

Complete the data table while outside to test the solar oven built last class. Remember that a variable is being tested, so one set of data will show the solar oven your group completed in table A, while the data for the other team will be shown in data table B. This will allow you to compare the variable being tested.

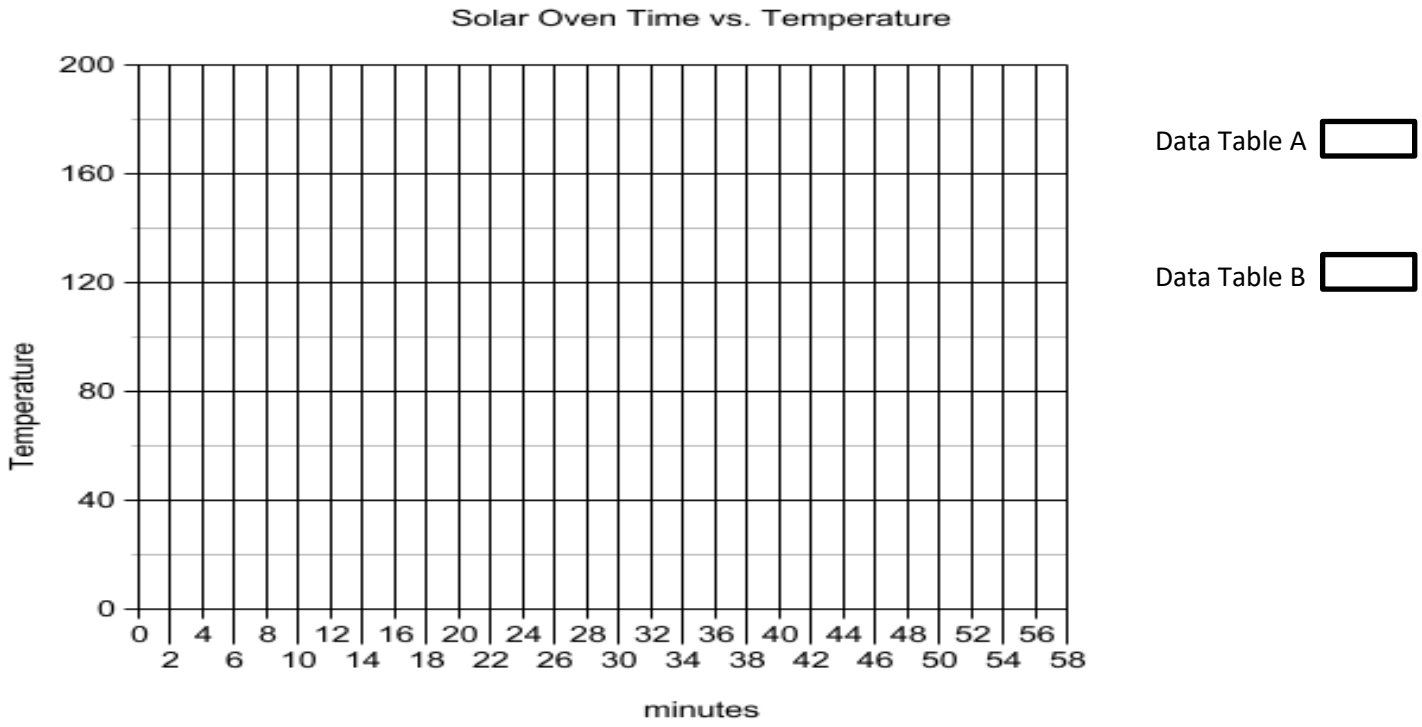
Solar Oven Time vs. Temperature
**Table A**

| Time (min) | Temp (°F) | Time (min) | Temp (°F) | Time (min) | Temp (°F) |
|---|---|---|---|---|---|
| **0** | | **20** | | **40** | |
| **2** | | **22** | | **42** | |
| **4** | | **24** | | **44** | |
| **6** | | **26** | | **46** | |
| **8** | | **28** | | **48** | |
| **10** | | **30** | | **50** | |
| **12** | | **32** | | **52** | |
| **14** | | **34** | | **54** | |
| **16** | | **36** | | **56** | |
| **18** | | **38** | | **58** | |

Solar Oven Time vs. Temperature
**Table B**

| Time (min) | Temp (°F) | Time (min) | Temp (°F) | Time (min) | Temp (°F) |
|---|---|---|---|---|---|
| **0** | | **20** | | **40** | |
| **2** | | **22** | | **42** | |
| **4** | | **24** | | **44** | |
| **6** | | **26** | | **46** | |
| **8** | | **28** | | **48** | |
| **10** | | **30** | | **50** | |
| **12** | | **32** | | **52** | |
| **14** | | **34** | | **54** | |
| **16** | | **36** | | **56** | |
| **18** | | **38** | | **58** | |

Use the information from the data tables to create a graph to display the results and answer the following questions. Use 2 different colors to identify the data from your group vs. the group you tested a variable with.



## Analysis Questions

1. What was the highest temperature solar oven "A" reached?

2. What was the highest temperature solar oven "B" reached?

3. What factor do you think affected the results between the 2 solar ovens the most?

4. What could be done to improve your group's solar oven?

## Activity 2 – Heat Island Trek

You will be comparing your January results to your August results to make some inferences about the heating of Earth's surface and how it relates to Earth's seasons, weather, and climate. You will need to be as accurate as possible with your measurements during this activity. You and your partner can do it while you are waiting for you solar oven to heat up.

You will need to get a metal-backed thermometer from your teacher. During this activity, you and your partner will be measuring the temperatures of six (6) different surfaces. The metal on the thermometer will help keep the thermometer a consistent distance above each of the surfaces. When you arrive at each location, place the thermometer (bulb end closest to the surface and metal back facing the sun) on the surface, and wait at least one minute. Take the temperature reading and record it in the data table below. You will use the pencil and sun altitude graph to measure the sun's altitude and the pencil shadow length. These only need to be measured once each at this time. Record the values in the table below.

| Surface Type | Sun Altitude (degrees) | Shadow Length (cm) | Class Period | Surface Temperature (°F) | Air Temperature (ambient) (°F) |
|---|---|---|---|---|---|
| Concrete (in sun) | | | | | |
| Concrete (in shade) | | | | | |
| Blacktop (in sun) | | | | | |
| Blacktop (in shade) | | | | | |
| Grass (in sun) | | | | | |
| Grass (in shade | | | | | |