

# Exploring Radiant Heat Transfer

In this experiment you will be measuring how much heat a system absorbs when exposed to energy in the form of electromagnetic radiation, like the energy that enters our Earth system from the sun.

You will be assigned 2 bins, each containing one of the following materials:

- Gravel
- Soil
- Black Sand
- Sand
- Water
- Salt Water
- Ice Water

The containers you are assigned will be exposed to a heat lamp for 60 minutes. You and your partner are responsible for measuring and recording the temperature of the material with an IR thermometer every 2 minutes and recording your measurements in your classes Google spreadsheet.

## To do **BEFORE** you collect data

1. Work with your partner to determine who will measure the temperature, who will record, and who will keep time on their watch or phone.
2. Get a computer and open up your Classes Google spreadsheet. Locate the column for your material. This is where you will enter your data
3. Measure the **Height** of the material in your bin a measure the **Width** and **Length** of the bin. Record them Below

Height: \_\_\_\_\_

Width: \_\_\_\_\_

Length: \_\_\_\_\_

4. Calculate the volume of the material in your bin, and record it below:

**To do DURING data collection**

1. Measure the temperature of the material
2. Record that temperature in the first available row in the column for your material.
3. Turn the heat lamp on
4. Set your timer for 2 minutes
5. After 2 minutes measure the temperature of the material again, make sure you measure the temperature at the same location as before.
6. Record that temperature in the google spreadsheet in the column of your material.
7. Repeat steps 4-6 thirty times.

Answer the following:

Which of the materials do you think will have the highest temperature after 60 minutes? Why?

\*\*\*Please use the ideas of Absorption, Reflection, Scattering, and/or Transmission of light to help justify your answer.

Which of the materials do you think will have the lowest temperature after 40 minutes? Why?

\*\*\*Please use the ideas of Absorption, Reflection, Scattering, and/or Transmission of light to help justify your answer.