

## Appendix 2. Experiment 1

**Necessary Materials:** balance scales, weight set, water, olive oil, thermometer, 2 x 250 mL Erlenmeyer flasks, 2 tripods, 2 spirit stoves, stopwatch, lighter or matches.

### Construction stages

- Weigh 100 g of water and 100 g of olive oil with a balance scale.
- Put the weighted water and olive oil into the Erlenmeyer flask.
- Measure the temperature of the liquids in the Erlenmeyer flask. Write the measurement results in the table below.
- Place the Erlenmeyer flask on the tripod. Light the identical spirit stoves that you put under the tripods at the same time.
- Heat the liquids in the Erlenmeyer flask for five minutes. Measure the final temperatures after five minutes. Record the measurement results in the table below.
- Calculate the temperature change in water and olive oil.

Answer the following questions based on the data you obtained during the experiment.

1) Write your hypothesis.

2) Fill in the blanks given in the table according to the data you obtained during the experiment.

Substances	Initial Temperature	Final Temperature	Temperature change
Water			
Olive oil			

3) Explain how the temperature changes of the substances to which you give the same quantity of heat differ. Explain your thoughts about the reasons for these changes.

4) Fill in the blanks in the sentences given below with appropriate words.

Water	Dependent variable	Independent	Heat increase
Independent variable	Olive oil	Temperature increase	Dependent

- As ..... changes ..... also varies.
- ....., ..... causes a change in the variable.
- ....., ..... are variables that are observed to change in response to the variable.
- In this experiment ..... is the dependent variable
- In this experiment ..... is the independent variable.

5) Fill in the blanks given in the table according to the data you obtained during the experiment.

Substances	Final Temperature	Initial Temperature	Time Elapsed
Water			
Olive oil			

*Water and olive oil, whose final temperatures are the same, are left to cool at room temperature.*

6) Explain how the time to reach their initial temperature changes when substances with the same final temperatures are left to cool at room temperature. Please explain your thoughts on the reasons for this difference.