Investigation

The research question: How efficient is the energy transfer from a spirit burner to a beaker of water.

Background

Spirit burners contain a fuel, usually a type of alcohol, that burns releasing energy. This energy may be used to heat up a liquid in a beaker.

The alcohol used in this experiment is methanol, CH₃OH, which releases 22.3 kJ of energy for every gram burned. By measuring the mass of the spirit burner before and after combustion, the mass of methanol burned may be found.

The energy absorbed by the water can be determined using the formula:

Q = mass of water heated x specific heat capacity x temperature change

Q = mc∆T

The specific heat capacity of water = 4.2 kJ Kg⁻¹ $^{\circ}C^{-1}$

Instructions

You are assigned roles in your team.

- 1. Supervisor
- 2. Lab technician
- 3. Quality control
- 4. Data analyst

The supervisor will discuss the design of the investigation with the team and once the design is agreed on.

The lab technician will gather the materials and ensure that all phases of the investigation are carried out safely.

The quality controlled will ensure that all of the variables are correctly controlled in collaboration with the data analyst who is responsible for all recording of data.

The data analyst must also ensure that all members of the team have copies of the data.

Equipment and apparatus

- Spirit burner (methanol)
- Electronic balance
- Beaker
- Thermometer
- Lighter (shared between groups)

Materials

- Water
- Methanol (in the spirit burner)

Instructions

In your teams you are to plan an investigation to determine the energy transfer efficiency when a sample of water is heated by a spirit burner.

There are several variables in this investigation. You must decide on the Independent variable, the dependent variable and the control variables.

You will discuss and formulate a team hypothesis and method for this investigation. These must be recorded in the experimental report.

The methodology should be formulated in bullet point format.



Use the report template on the next page to write up your investigation.

Name:	
Hypothesis	
Mathad	
Method	
Dete ve en dia e	
Data recording	
Data analysis	
Conclusion	
Evaluation	