NEWTON'S LAW OF COOLING EXPERIMENT SET USING TEMPERATURE SENSOR ARDUINO

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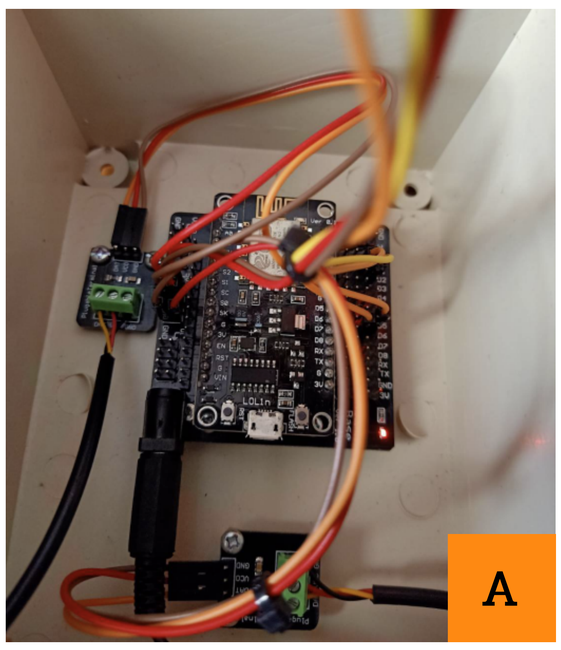
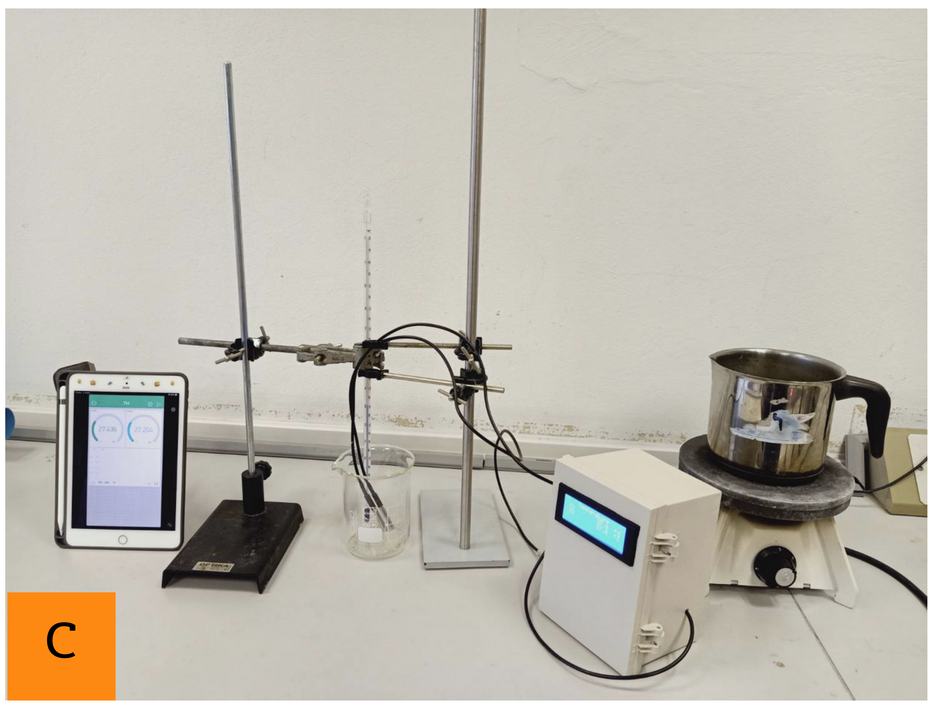
ABSTRACT

The research aims to develop the experimental set of the temperature measurement in liquid by Arduino program.

TOOLS AND METHODS





A : Processing unit
B : Display unit and Application Blynk
C : Newton's Law of Cooling Experiment Set using Temperature Sensor Arduino

EXPERIMENTAL RESULTS

- The experimental set is composed of 1) 2 liquid temperature sensors (DS18B20 model), 2) Arduino program, and 3) LED screen for showing the temperature value in unit of °C. The experimental set is measurable the liquid temperature from -55 °C to 125 °C.
- The effective of the temperature sensor 1 and temperature sensor 2 is 1.57% and 1.51% errors respectively compared with temperature sensor of B Smart Sayence Co., Ltd. Company.
- Moreover, the experimental set can display the data on Smartphone via Blynk Application.
- The research is applied to the laboratory class on Newton's law of cooling for finding Liquid cooling rate. And when used to calculate the cooling rate of the water, it will be equal to $3.25 \times 10^{-3}\ \mathrm{s}^{-1}$

SUMMARY

The experimental set developed in this study is:

- a low-cost tool,
- high efficiency,
  simply displayed results on a
- smartphone, and
  convenient to detect the cooling rate of liquid in the Newton's law of cooling experiment.

Graph the relationship between temperature and time of water.