



**SSI 3013**

**INFORMATION AND COMMUNICATION  
TECHNOLOGY FOR SCIENCE**

**EXPERIMENT REPORT (DATA LOGGER)**

**TITLE: REGULATION OF HUMAN BODY TEMPERATURE-LOSS OF HEAT  
THROUGH SWEAT PRODUCTION: HEAT LOSS MEASURED AT FINGERTIPS**

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TITLE:

REGULATION OF HUMAN BODY TEMPERATURE-LOSS OF HEAT THROUGH SWEAT PRODUCTION: HEAT LOSS MEASURED AT FINGERTIPS.

OBJECTIVES:

1. Learn and apply the use of data logger to collect data.
2. Measure the loss of heat through sweat production at fingertip.
3. Analyze the relationship between humidity and body temperature.

APPARATUS

1. A plastic bag
2. 2 rubber bands
3. A humidity sensor
4. Two temperature sensor (-10° -50°)
5. A discovery

PROCEDURES

1. The data logger was set up to:

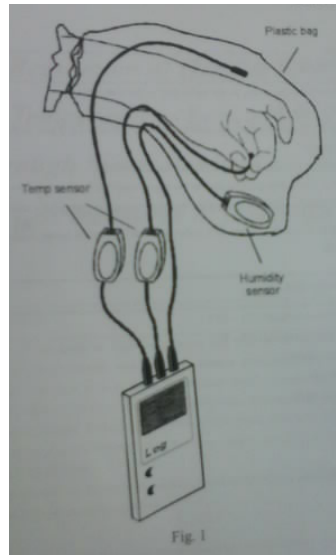
Input 1: Temperature (-10° -50°)

Input 2: Humidity

Rate: Every second

Samples: 2000

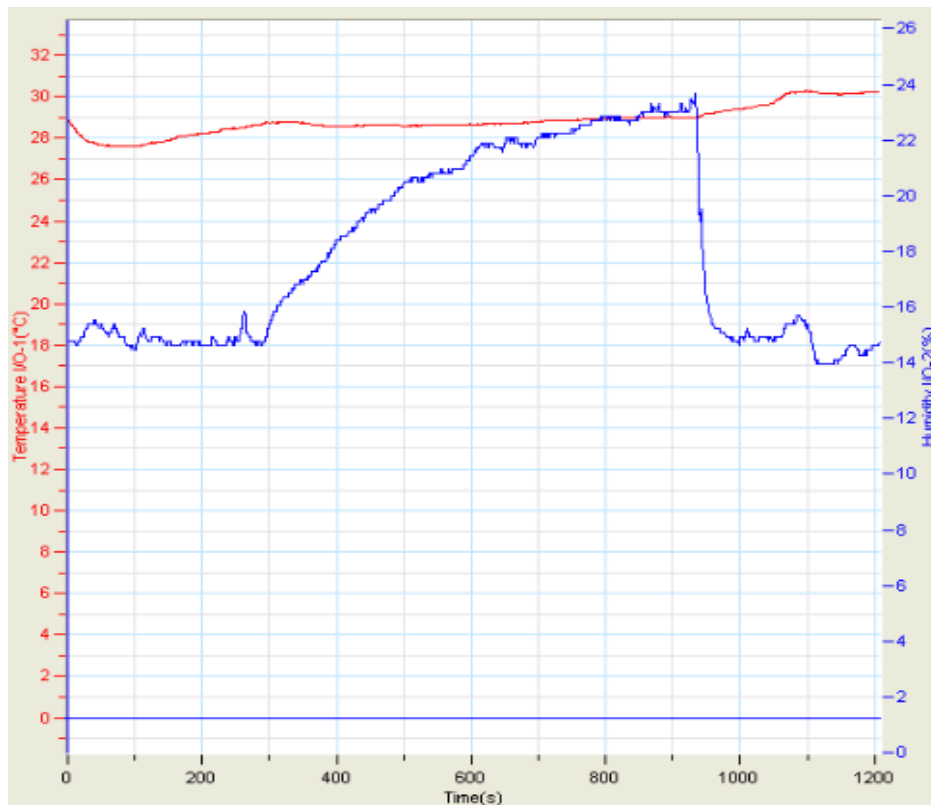
2. A temperature sensor was attached to the finger at the right arm
3. Start the discovery at the data logger.
4. After 5 minutes, the hand holding the temperature sensor and the humidity sensor was covered with the plastic bag as shown in Figure 1.



5. The plastic bag covered the hand and the sensors, was tied using two rubber bands to prevent air flow into and out of the plastic bag.
6. The discovery was 10 minutes without end the data longing to follow changes in humidity and temperature inside the bag.
7. After 10 minutes, the plastic bag was removed from the hand.
8. The discovery on the temperature of finger and humidity was followed for 5 minutes.
9. After 5 minutes, the data logging was ended.
10. Data collected in the data logger then was transferred into a laptop using Discover IT Software.

## RESULT

		Exp. 12	Exp. 12
	Time (s)	Temperature	Humidity I/O
1199	1199	30.252	14.603
1200	1200	30.252	14.603
1201	1201	30.252	14.603
1202	1202	30.252	14.603
1203	1203	30.252	14.603
1204	1204	30.252	14.603
1205	1205	30.252	14.603
1206	1206	30.252	14.603
1207	1207	30.252	14.762
1208	1208	30.252	14.762



## DISCUSSION

In this experiment, students learnt and apply the use of data logger to collect data. Students also know how to handle the data logger by using it in this experiment.

The data logger helps students to handle and analyze data efficiently. By using the data logger, students also are able to store and then analyze all data that have been recorded. Next, students also are able to draw a smoother and accurate graph from the result obtained. In addition, by using this technology, students manage to get accurate result with less parallax error. Students also manage to save time by using this technology because two types of data can be obtained in one time.

Students had done experiment about regulation of human body temperature according loss of heat through sweat production measured at fingertips. From the graph, the temperature was at body temperature which is about 27°C-28°C for the first 5 minutes (0s-200s). As for humidity, it is range between 0.17%-0.19%.

Next, after 5 minutes, the student's hand and all the sensors of temperature and humidity were covered by the plastic bag and tied by using two rubber bands to prevent air flow into and out of the plastic bag. The graph show that temperature is slightly increase by 1°C. However, the humidity increases in large amount which is about 0.08%. This happened because when the hand is put into plastic bag and no air was flowing in and out of it, the heat emitted by our body also cannot flow out of the bag which caused the temperature of air in the bag to increase. Thus, the hand temperature also increases. As temperature increased, the

thermoreceptors in hand will detect it. Human bodies are very sensitive to temperature increase. Then our body will start to regulate the temperature so it turns back to normal value by excreting sweat through hair pore. The air humidity hence increases because of the sweat produced.

After that, the temperature keeps increasing while the humidity decreases abruptly after student took out her hand off the plastic bag. This is because the air now is in the surrounding, thus the readings of humidity are the same as in the beginning of experiment. The temperature of body or at the fingertips should be decreasing to the beginning state of experiment, but due to some parallax error, the temperature keeps increasing.

Even when using the data logger, the students also should take some precaution steps in order to obtain more precise result. Some of the precautions steps are students should hold the temperature sensor only at their fingertips not with their hand or palm as well. The plastic bag should be tied tightly to ensure that no air is flowing in or out of the bag. But please make sure the blood flows are not blocked.

## CONCLUSION

Students are able to handle the data logger. In human body, when the body temperature increases, body will regulate it by producing sweat. When the body temperature increases, the humidity also will increase due to sweat production.