ScienceCube

Humidity in Various Places

1. **Understanding the Concept of Humidity and Measuring Humidity in the Air**
2. **Measuring Humidity in Various Places and Explaining the Factors of Humidity Changes**

Fundamental Concept

1. Relative Humidity

(1) The amount of water vapor in the air or the degree of humidity in the air.

(2) The ratio of the current amount of water vapor to the maximum amount of water vapor the air can hold.

(3) The relative humidity is 100% at the dew point.

(4) When the temperature is constant, the more water vapor present, the higher the relative humidity.

(5) When the amount of water vapor is constant, the higher the temperature, the lower the relative humidity.

$$\text{Relative Humidity(\%)} = \frac{\text{Current Amount of Water Vapor in the Air(g/kg)}}{\text{Saturation Amount of Water Vapor at the Current(g/kg)}} \times 100$$

2. Absolute Humidity

(1) The amount of water vapor present in 1 kg of dry air.

3. Effects of Humidity on Our Lives

Condition	Phenomenon	Humidity Control Methods
High Humidity	High discomfort index, Mold growth, Easy food spoilage	Open windows for ventilation, use a dehumidifier, turn on a heater
Low Humidity	Laundry dries well, High fire risk, Dry skin	Turn on a humidifier, hang wet towels

Experiment

Materials Needed

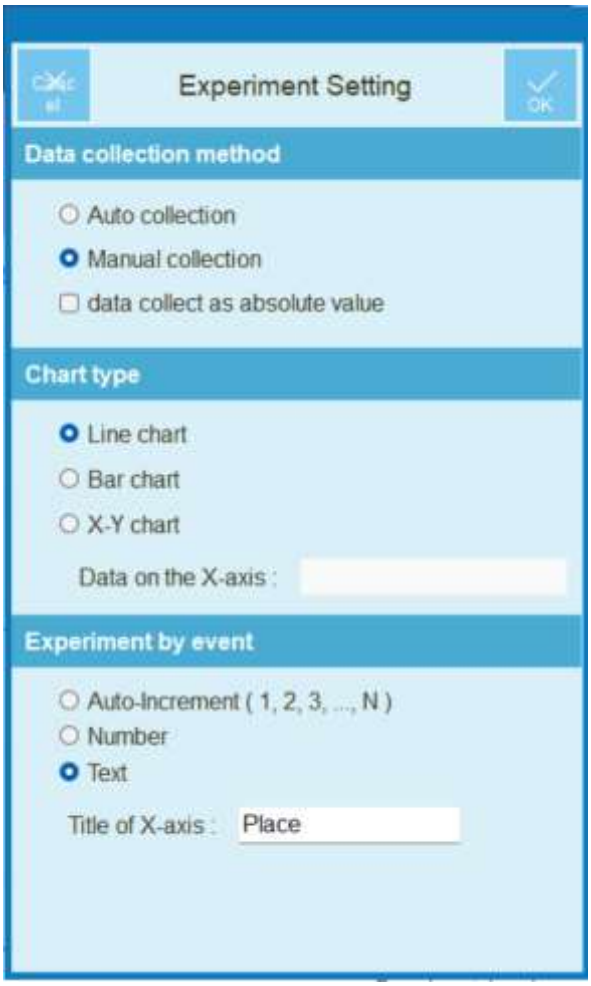
mart Sensor Box (SSB), Science# program (smart device)

Experimental Setup

1. Think of the places where you want to measure humidity and record them in the table.
   Example measurement places: classroom, playground, bathroom, forest, riverside

Interface Setup

1.  Run Science#.
2. Connect the Smart Sensor Box to Science# (via Bluetooth or cable).
3. Press the button  to activate the humidity sensor among the built-in sensors.
4. Press the button  to set up the experimental environment as shown below or press the button  for automatic setup.



Data Collection

1. Move to the place where you want to measure humidity.
2. Press the button  and wait for about 5 minutes until the data stabilizes.
3. Once the data stabilizes, press the button  to collect the data and record the place name.

4. Measure the humidity in various places using the same method, and press the button  to end the experiment.

Data Analysis

Recording Data

1. Display the humidity measured in various places in a bar graph for comparison and record it in a table.

Place				
Humidity (%)				

Data Application

1. List the places with the highest and lowest humidity in order.

Place with the Highest Humidity	Place with the Lowest Humidity

2. Explain the reasons for the results observed.

3. The discomfort index is mainly affected by temperature and humidity. Indicate with arrows how the discomfort index changes with humidity at the same temperature, such as in a hot summer, and think about the reasons for it. (High ↑, Low ↓)

Category	High Humidity	Low Humidity

Discomfort Index	↑	↓