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Science Experiment 2

(contains 3 experiments)

RESPIRATION

Objectives:

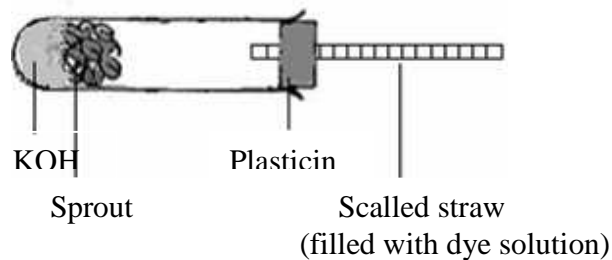
In this experiment you will determine the respiration rates of sprout

Materials:

- | | |
|--------------------------|-----------------|
| 1. long sprout | 6. short sprout |
| 2. scalled plastic straw | 7. timer |
| 3. plasticin | 8. KOH |
| 4. reaction tubes | 9. dye solution |
| 5. Tissue/filter paper | |

Procedures:

1. Prepared 2 tubes and give label to the tubes (A and B)
2. Put 14 long sprout in tube A and 18 short spout in tube B
3. Covered the tube with plasticin and straw (Arranged the equipment as seen in the picture above).



4. Observe how far dye solution move in every two minutes for 5 times.
5. Put your result on the table
6. Assume that 1 scale is 1 ml of oxygen consumed, calculate the respiration rates of long sprout and short sprout in each minutes.

Table 1 Respiration rates in two different sprouts

Time (per 2 mins)	Volume O ₂ (ml)	
	Sprout A	Sprout B
I		
II		
III		
IV		
V		
Respiration ratesml/minml/min

Answer the following Questions:

1. Which sprout has a higher respiration rates?
2. Explain why the respiration of sprout A and sprout B is different?
3. Change the table of your data into the graph. Respiration rates on the horizontal axis and time in the vertical axis.
4. Write down the conclusion of the experiment

1. Short sprout (B) has higher respiration rate
2. - surface area in sprout B wider than sprout A
 - number of short sprout (B) higher than sprout A
 - activity of sprout B higher than sprout A
- 3.
4. conclusions :
Rate of respiration are depended on : number of individu, surface area and growth activity.

FRICTION FORCE

Friction force between two contacting surfaces plays important role in our daily life. The surfaces of vehicle tires and the surface of roads must not be smooth to generate appreciable friction forces between them. This friction force avoids a slippery motion of the vehicles, which may cause the occurrence of unexpected accidents. On the other hand, lubricant oils are used to reduce the friction forces between the moving parts in machines to avoid the occurrence of any damage on the machine as well as to enhance the efficiency of energy usage. The friction force between two surfaces depends on the contacting forces between these surfaces (how strong one surface pulls another surface) and the nature of the contacting surfaces. Mathematically, the friction force between two contacting surfaces just before a relative motion between two surfaces occurs can be expressed as

$$F_s = C N$$

where

F_s : the friction force

N : the contacting force between two surface

C : a factor which describes the nature of the contacting surfaces. This factor is known as the coefficient of friction.

Objectives:

In this experiment, you will measure the friction force between two contacting bodies using two methods: i.e., (a) using a spring balance and without spring balance (b). You must compare the results obtained by these two methods.

Materials:

1. Wood plate
2. Three blocks (200 g, 300 g, and 400 g) having different surface roughness:

- (a) covered with a coarse sand paper,
- (b) covered with a fine sand paper,
- (c) covered with a mica

3. Spring balance

4. Ruler

Questions:

Determine the coefficient of frictions between each block and plane surface using a spring balance. You must report the method (procedure) of measurement.

A.1. Surface covered with coarse sand paper

Block mass (kg)	Contacting force or weight (N)	Friction force just before surface slippery (N)	Coefficient of friction
0.2			
0.3			
0.4			

A.2. Surface covered with fine sand paper

Block mass (kg)	Contacting force or weight (N)	Friction force just before surface slippery (N)	Coefficient of friction

A.2. Surface covered with mica

Block mass (kg)	Contacting force or weight (N)	Friction force just before surface slippery (N)	Coefficient of friction

THE MAGIC OF ELECTRICITY

Energy can change its form from one to another. For instance, light energy of the Sun is changed to chemical energy by plants through photosynthesis process.

Objectives:

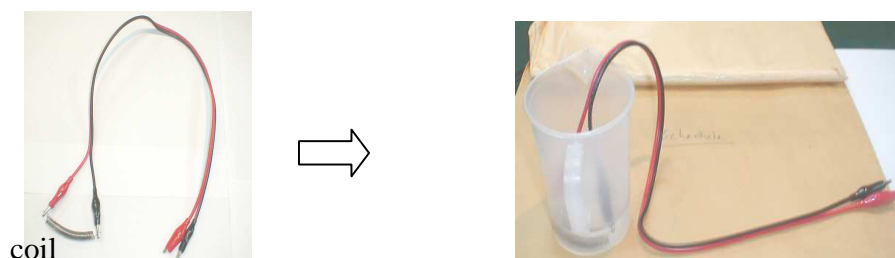
In this experiment you will observe the change of electricity into heat energy.

Materials:

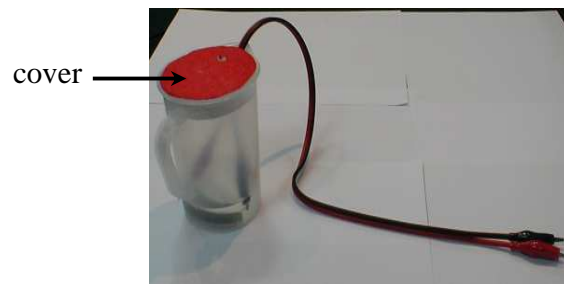
- plastics cup (50 ml) with cover
- water
- cables and connectors
- coil
- batteries with holder
- thermometer
- timer

Procedures:

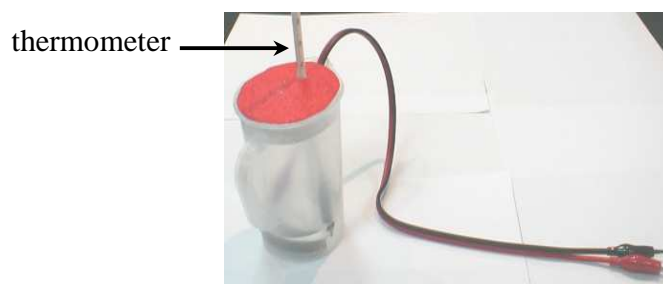
1. Fill the plastics cup with 50 ml of water
2. Connect the coil with connector then put it into the plastics cup. Make sure that whole coil is immersed in water. (See figure below)



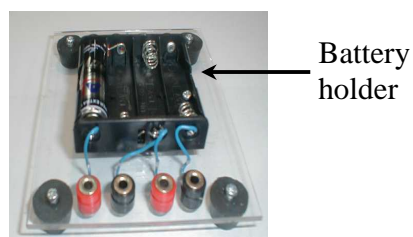
3. Put the cover of cup on the top of the cup and make sure that it can seal the cup properly (See figure below)



4. Put the thermometer into the hole provided in the cover of cup (see figure below)



5. Put one battery (1.5V) on the battery holder properly.



6. Arrange the experimental apparatus according to the picture below.

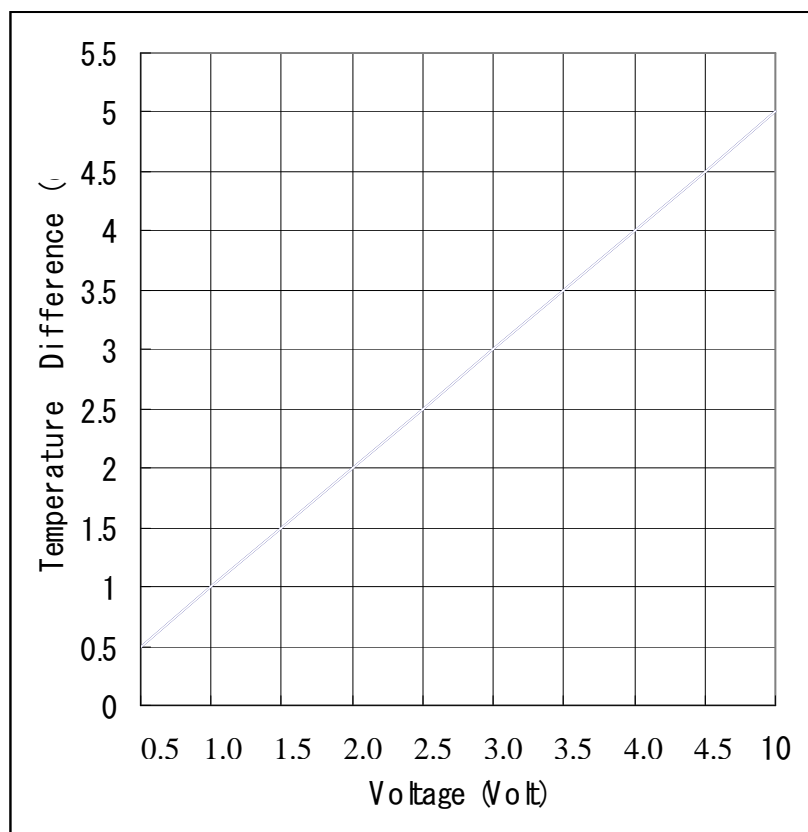


7. Measure the initial temperature of water in the plastics cup by using the thermometer provided.
Write down the measured temperature on the Table provided below.

8. Connect the coil to the battery for 5 minutes. Disconnect coil and battery and then measure the temperature of water by using the thermometer provided. Use the timer to measure the time. Write down this measured temperature on the Table.
9. Add one (1) battery serially to the circuit so that the voltage become 3.0 V and then repeat the steps 7 and 8.
10. Add one (1) more battery serially to the circuit so that the voltage become 4.5 V and then repeat the steps 7 and 8 again.
11. Calculate the difference between the temperature of water after 5 minutes heating and the initial temperature for each voltage.

No	Voltage (Volt)	Initial temperature of water ($^{\circ}\text{C}$)	Temperature after 5 minutes Heating ($^{\circ}\text{C}$)	Temperature Difference ($^{\circ}\text{C}$)
1	1.5			
2	3.0			
3	4.5			

12. Draw a graph of the temperature difference of water againsts the change of the voltage.



Analysis:

If the amount of water is 50ml and the voltage is 1.0 V, predict the temperature of water.