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# **Science Experiment 1**

## **(contains 3 experiments)**

# ALTITUDE OF STARS

## Objectives:

To determine the altitude of stars from the horizon

## Materials:

1. Pipe
2. Protactor
3. Masking tape
4. String
5. Heavy bolt
6. Artificial stars

## Procedure:

1. Construct an equipment using the available materials for determining the altitude of stars from the horizon.
2. Estimate the altitude of 3 stars
  - a. Look through the pipe (keeping one eye closed) at star 1. Read the degrees on the protactor.
  - b. Look through the pipe (keeping one eye closed) at star 2. Read the degrees on the protactor.
  - c. Look through the pipe (keeping one eye closed) at star 3. Read the degrees on the protactor.

## Results and conclusion:

Write down your results and conclusion

# MAKE YOUR OWN KEY TO IDENTIFY FRUITS

Plants and animals are useful to humankind. We need plants for food and medicine, to supply the atmosphere with oxygen, to help water conservation, etc. It is important to identify the plants to know its' usefulness. One way to identify plants or animals is using keys. One of example is the following keys that can be used to identify nuts and beans. You may try to use the keys.

## **Objectives:**

In this experiment you will identify some fruits based on a key you made using known beans and nuts.

## **Materials:**

1. Small bags
2. Various kinds of beans
  - a. Red beans
  - b. soy beans,
  - c. coffee beans
  - d. cashew nuts
  - e. peanuts
3. Baby carrot (15 kg)
4. Passion fruit (15 kg)
5. Zalacca (10 kg)
6. Mangosteen (10 kg)
7. Baby radish (15 kg)
8. Radish (5 kg)

## **Procedure:**

*Creating your own keys*

Observe five different beans and nuts available on your desk, use the following keys and put the beans on little plastic bags available inside a red color code bag.

Use the following keys to identify the object

1. Is the beans smells coffee? If yes .....Coffee bean  
If not ..... go to no 2

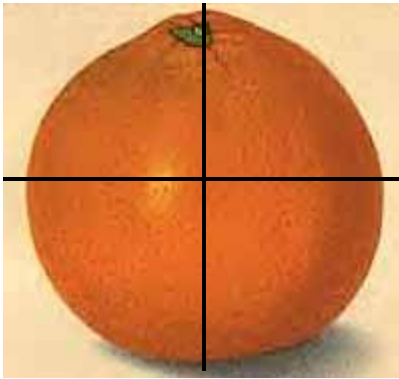
2. Is the beans has black spot ? ..... Soy bean  
If not ..... go to no 3

3. Is the beans has red color? ..... Red bean  
If not ..... go to no 4

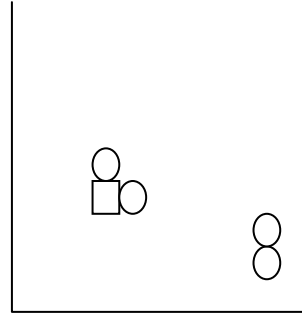
4. Is the beans longer than 4 cm ..... Cashew nut  
If not ..... Peanut

***Questions:***

1. Keys are made based on a range of biological character such as shape, color etc. Create keys as many as you can to identify the following objects available on the bucket.
2. With your ruler measure the dimension of those objects and plot your measurement in the following graph. Use the axis of each object to measure the length and width see the example
3. Keys are made based on a range of biological character such as shape, color etc. Create keys as many as you can to identify the following objects available on the bucket. Remember each item (number) maximum contain only two statements.
4. With your ruler measure the dimension of those objects and plot your measurement in the following graph. Use the axis of each object to measure the length and width see the example



Width



Length

Students will do exercise by them self to get the idea of using a key

It will be many variation of key based on shape, color, texture of skin, taste of the fruit etc. We mark keys which can be use to distinguish the fruits.

For example :

1. Fruit...?.....go to 2  
If not : .....go to 4
2. Hairy skin.....passion fruit

# ELECTRICAL RESISTANCES OF METAL WIRES

Every material is characterized by its electrical resistance. If a metal wire is connected to a battery, electrical current will flow through the wire. By reading the voltage difference between the ends of the wire and the current flowing through the wire, the resistance of the wire can be calculated.

## Objectives:

In this experiment you will determine the resistances of materials.

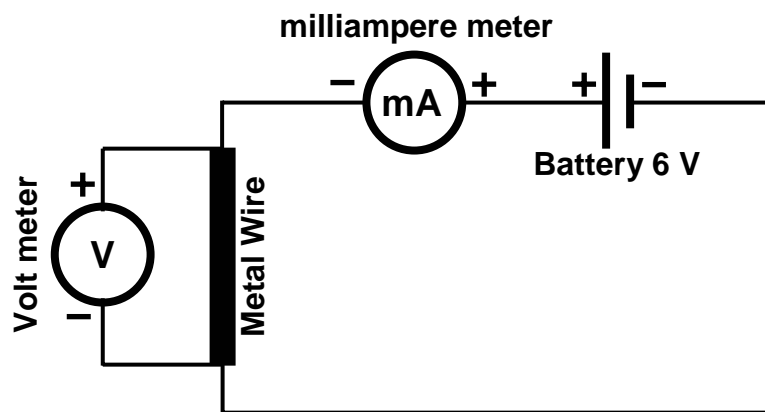
## Materials:

Electrical circuit board

Four batteries 1.5 V

## Procedure:

1. Arrange the following electrical circuit using an electrical board and electrical jumpers/connectors provided:



2. The dependence of resistance on the length of a metal wire is investigated. Use a metal wire with the cross-section area  $A_1$  of  $0.1 \text{ mm}^2$  and the length ( $L$ ) of 5 cm. Read the electrical current ( $I$ ) flowing through the wire and the voltage ( $V$ ) across the wire, which are displayed by a milliampere meter and a volt meter, respectively.
3. Repeat the measurement for the length ( $L$ ) of 10 cm, 15 cm, and 20 cm.

4. Calculate resistance ( $R$ ) of the wire using the relation  $R=V/I$ .
5. Make a table for the measurement and calculated resistance.
6. Make a graph describing resistance ( $R$ ) as a function of wire's length ( $L$ ) from the table.
7. Now, resistance as a function of wire's cross-section area is investigated. Use a metal wire with the length of 20 cm and the area  $A_1$  of  $0.1 \text{ mm}^2$ . Read the electrical current ( $I$ ) flowing through the wire and the voltage ( $V$ ) across the wire.
8. Repeat the measurement for the area  $A_2$ ,  $A_3$ , and  $A_4$ .
9. Calculate resistance ( $R$ ) of the wire using the relation  $R=V/I$ .
10. Make a table for the measurement and calculated resistance.
11. Make a graph describing the dependence of resistance ( $R$ ) on  $1/A$  from the table.

**Question:**

What are your conclusions from the two graphs.