

Skill D: Evaluating

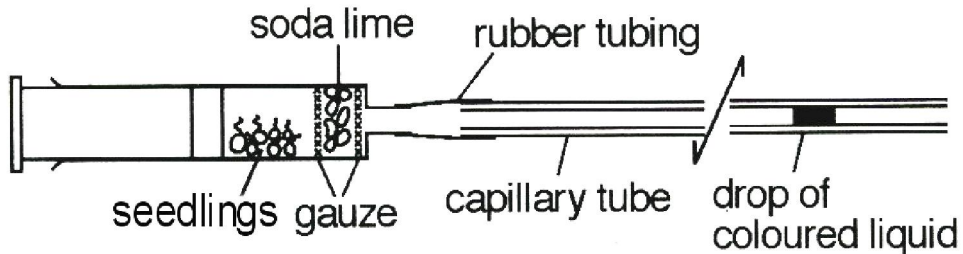
Skill Assessed	D
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Experiment No. : DP3 **Time: 50 mins**
Worksheet Title : To investigate the rate of uptake of oxygen using germinating beans placed in a simple respirometer.

Aim: In this experiment you will be assessed on your ability to:

- identify sources of error and limitations
- suggest how the experiment could be improved

Description: The following set up is called the respirometer.



You are also provided with germinating peas and soda lime granules. Soda lime absorbs any carbon dioxide present.

Apparatus: Syringe with rubber tubing and capillary tube attached
 scale paper
 stopwatch
 blotting paper
 spatula
 muslin cloth

Material: soda lime granules
 2 mung bean seedlings
 ink (for manometer fluid)

Procedure:

1. Wrap 4-5 soda lime granules in a piece of muslin provided. Place it into the syringe barrel.

Caution: Soda lime is corrosive. If any should come into contact with your skin was immediately under cold water.

2. Take one of the mung bean seedlings and carefully remove and discard its testa (seed coat). Place the seedling into the syringe barrel.



3. Replace the plunger and push it in until it is about 0.5cm from the seedling. Attach the capillary tube securely to the syringe.
4. Dip the end of the capillary tube into the manometer fluid provided so that a drop is introduced into the tube.
5. Wipe excess fluid from the tube. The size of the drop of manometer fluid in the capillary tube is not important as long as it can be seen clearly.
6. Place the respirometer horizontally on the separate piece of white paper with which you have been provided. Leave it for **two** minutes. Check that the manometer fluid is now moving smoothly towards the syringe.
7. **Without handling the apparatus**, measure, in mm, the distance travelled by the manometer fluid in four consecutive time intervals, each of one minute. Do this by marking the position of the fluid on the scale paper and reading off the distances.
8. Repeat with fresh mung bean seedlings and fresh soda lime granules.
9. Comment on the main sources of error and the limitations of the experimental procedure and/or measurements made.
10. Suggest how the errors/limitations could be overcome.
11. Suggest how the experimental procedure can be improved.

Table of distances moved by manometer fluid

Time / min	Distance moved by manometer fluid / mm
1	
2	
3	
4	
Average	