

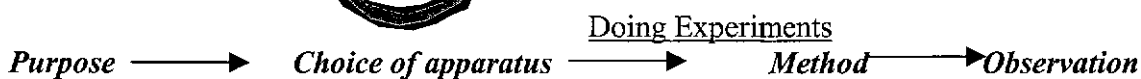
Appendix V.2

**St. Francis' Canossian College**  
**Project Learning 2002-2003**  
Steps in Scientific Investigation III

Name: \_\_\_\_\_

Class: F.1 \_\_\_\_ ( )

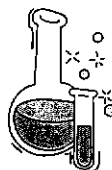
What is the Fourth Step of scientific investigation?



**Part I: Choice of apparatus**

We need different APPARATUS to carry out experiments.

APPARATUS are the device or equipment that we need when carrying out experiments.



**Activity:**

1. When we measure the length of a straight line, we use R\_\_\_\_\_.
2. When we measure the temperature, we use T\_\_\_\_\_.
3. When we measure our weight, we use B\_\_\_\_\_.



Study the following cases, write down the necessary apparatus as many as possible.

**Case 1**

Kelly has some cardboards and she wants to use them to make a gift box of size 20cm x 20cm x 10cm. Can you list out all the apparatus or equipment that she needs to make the gift box?

\_\_\_\_\_

\_\_\_\_\_

**Case 2**

Mark and Nicola are given 2 different brands of paper towel. They are to carry out tests to find out which brand absorbs more water. Mark cut the paper towels into long narrow strips and Nicola put them in water. Can you help them to list out all necessary apparatus or equipment in order to carry out the experiment?

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**Part II:****Design a Fair Test****Case study 1**

Some students were going to find out whether or not a plant would grow better if eggshell is added to the soil. They decided to carry out a scientific investigation.

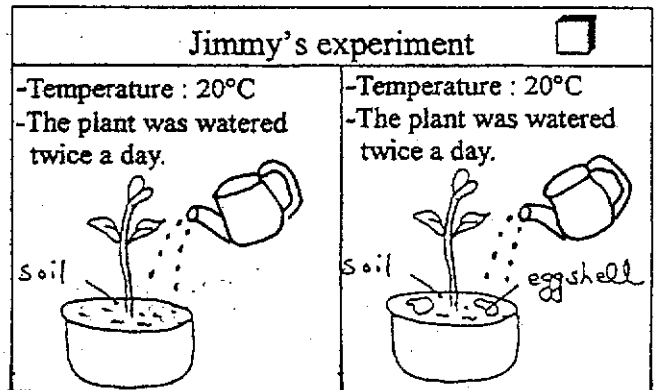
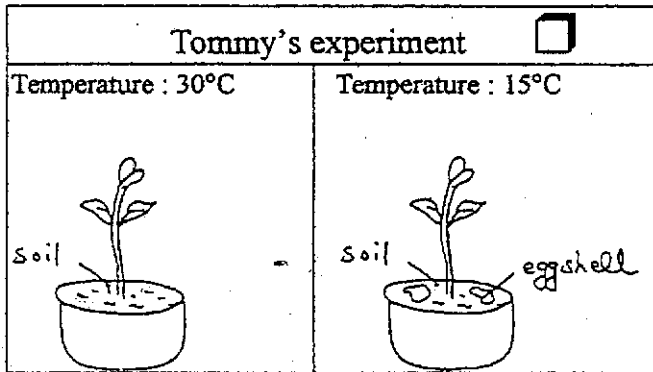
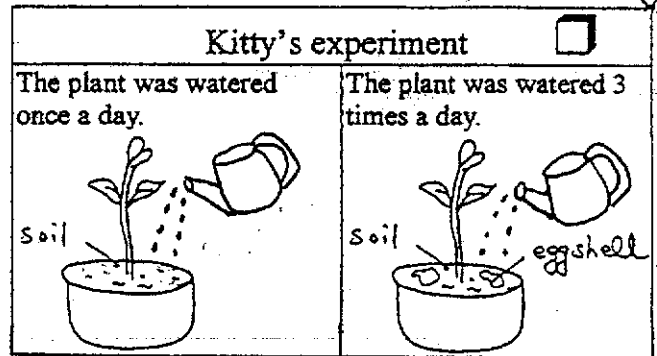
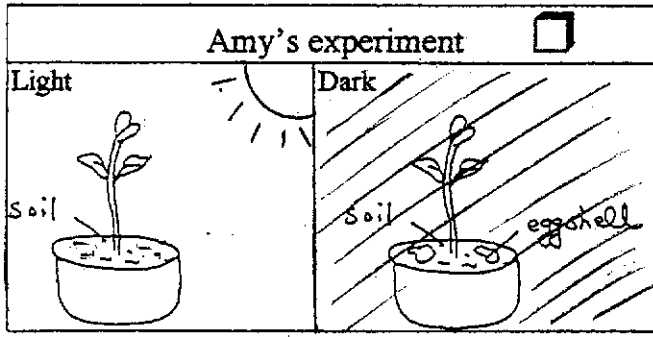
**Question:** Will a plant grow faster if eggshell is added to the soil?

**Hypothesis:** A plant growing in soil with eggshell added will grow faster than the one without eggshell.

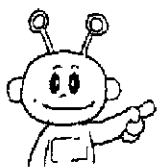
**Method:** Each of the students took two pots of plants, one with eggshell added to the soil and the other without. They measured the height of the two pots of plants after 1 week to see which one would grow better.

Find out whose experiment results are more reliable and put a tick in the box above.





Which experiment is a Fair test? \_\_\_\_\_



What you will change?	What you will measure?	What you will keep constant?

To find out whether a hypothesis is correct, we have to design a fair test. This is because there are many factors (variables) affecting the results of the experiment, such as sunlight, temperature, amount of water added etc. For the test to be fair, all these variables have to be kept constant. We call these **controlled variables**.

In a fair test, the result is affected by one variable only, this is called **independent variable** (what you will change). And what will you measure in the experiment is called the **dependent variable**.

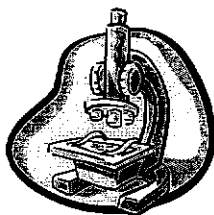
**Case study 2**

(refer to the homework given on session 2)

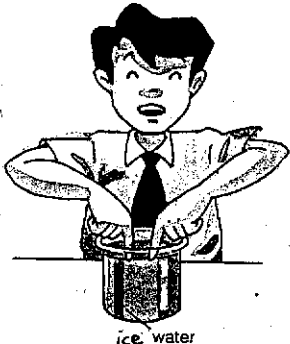

Jimmy wanted to find out whether small substances dissolve more quickly than big ones. He measured the time it takes for granulated sugar and sugar cubes to dissolve in water. Try to complete the following table:

<u>Independent variable</u> (what you will change)	<u>Dependent variable</u> (what you will measure)	<u>Controlled variables</u> (what you will keep constant )

### Part III: Observation



Observations are what one sees, tastes, smells, hears and feels. There are two types of observations.

<p><u>Qualitative Observation</u></p>	<ul style="list-style-type: none"> <li>It describes the things such as colour, odour and taste, or involves rough measurement like tall and short, hot and cold.</li> </ul> <p>e.g. Use the hand to feel how cold is the ice water.</p>  <p style="text-align: center;">ice water</p>
<p><u>Quantitative Observation</u></p>	<ul style="list-style-type: none"> <li>It involves actual measurements.</li> </ul> <p>e.g. Use thermometer to measure the temperature of the ice water.</p> 

#### Activity:

Give ONE example for each kind of observation.

Qualitative Observation	Quantitative Observation