

Investigation skills

GO! Activity 1

1. (a) An observation is something which is **noticed** in the course of everyday life or during a **survey** or study.
 (b) State that a hypothesis is a proposal which explains an **observation**.
 (c) State that an **aim** gives the purpose of doing an experiment and mentions the **independent** and the dependent **variables**.
2. Independent – variable being investigated.
 Dependent – variable which makes up the results.
 Controlled – variables that are kept constant.
3. Any of: temperature; volume of pond water; mass of pond weed; time for photosynthesis.
4. (a) Harmful or irritating chemical
 (b) Electrical hazard
 (c) Fire exit

GO! Activity 2

1. Graph correctly drawn.
2. As the light intensity increases the rate of photosynthesis increases then levels off.

GO! Activity 3

1. (a) Counting bubbles is not an accurate way of measuring a gas volume.
OR
 Distance from lamp is not an accurate way of measuring light intensity.
 (b) The controlled variables – temperature, volume of pond water, mass of water plant and time – have been kept constant.
 (c) The results data is more reliable because the experiment been repeated.
 (d) Collect gas in a measuring cylinder **OR** use a light meter to record light intensity.
2. Any five of: aim, hypothesis, method, results, discussion, references.
3. Conclusions and evaluations.

GO! Assessment

1. (a) To test the effects of acidity levels on the rate of enzyme reactions/browning in apple tissue. 1
- (b) Likely steps include:
- Use lemon juice with water to give 100%, 75%, 50%, 25% and 0% acidity.
 - Cut several equally sized slice of apple and place in the dimples of a tile.
 - Add five drops of a lemon juice dilution to one slice.
 - Repeat with the remaining dilutions.
 - Time how long it takes for each slice to turn brown.
- (1 mark each)** 5
- (c) Graph with appropriate scales and labelled axes. 1
 Points plotted correctly and joined with straight lines. 1
- (1 mark each)**
- (d) Answers will depend on results but a likely answer is that as acidity levels increase the rate of enzyme action/browning decreases. 1
- (e) Answers will depend on procedure followed but acceptable answers include:
- accuracy: browning times are estimates/not accurate 1
 - validity: apple slices might not be weighed 1
OR browning starts before acid added
 - reliability: experiment has/has not been repeated 1