BIOLOGY

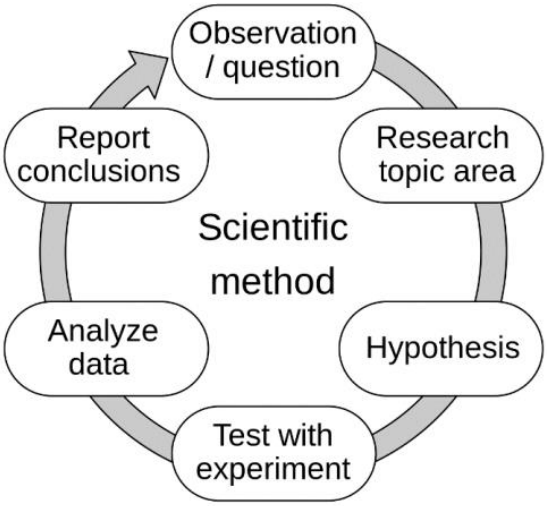
Lesson 1: Science of Living Things

Topic 2: Scientific Method

Scientific approach is a systematic approach used to investigate enquiries arising from any observation made in nature.

It is a process of inquiry that involves observing, asking questions, making hypotheses, conducting experiments or investigations, collecting data, analyzing evidence, and drawing conclusions.

Therefore, the scientific method is the tool used to unravel the mysteries of life. This method involves the following steps;



- **Observation:** Scientists make observations of the natural world and identify a specific phenomenon. These observations can be based on previous research, personal experiences, or curiosity.
- **Inquiry or Asking question:** This involves asking thoughtful questions about the observed phenomenon or event.
- **Formulating a Hypothesis:** Based on the observations and background research, scientists develop a hypothesis, which is a testable explanation or prediction about the phenomenon under investigation.
- **Designing and Conducting Experiments:** Scientists design experiments or investigations to test their hypothesis. They determine variables, define control groups, and develop a

procedure or methodology to collect data. The experiments should be carefully controlled, allowing for the manipulation of variables and the collection of measurable data.

- **Data Collection and Analysis:** During the experiment, scientists collect and record data systematically. They use appropriate tools, instruments, or technologies to ensure accurate measurements or observations. The collected data is then analyzed using statistical methods or other analytical techniques to identify patterns, trends, or relationships.
- **Drawing Conclusions:** Based on the analysis of the data, scientists draw conclusions about whether the results support or refute the hypothesis. They evaluate the significance and reliability of the data, considering potential sources of error or limitations in the experiment.
- **Communicating Results:** Scientists communicate their findings through scientific papers, presentations, or other means. They share their methods, data, and conclusions, allowing others to review, replicate, or build upon their work.

Reporting Experimental Results

To report the results of an experiment, the following patterns are used, as designed by the scientist. This includes;

- **Aim:** This is to state the purpose of the experiment.
- **Apparatus or materials:** These are the materials that would be used in the experiment.
- **Procedure or method:** This describes the details of step-by-step ways of setting-up the experiment.
- **Observation:** This refers to what is seen during the experiment and after.
- **Conclusion:** This is making an admission or conclusion on the outcome of the experiment based on the final result or observation.

Note: A hypothesis that has been tested and found to be consistently correct, is called theory. Also, if a theory is tested and proven to be true, it becomes a law or principle.