**Year 11 Human Biology**

**Study Checklist**

**Please note: This checklist is to be used as a guide only. The information in this checklist does not reflect the full syllabus.**

**Topic: INVESTIGATING SCIENTIFICALLY / THE SCIENTIFIC METHOD**

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|  | **Accuracy** | The extent to which a measurement result represents the quantity it purports to measure; an accurate measurement result includes an estimate of the true value and an estimate of the uncertainty. |
|  | **Aim** | The aim of an experiment is the objective. In other words, it says what can be learned from the experiment. "To see how light is affected by lenses and plates of glass of various thickness." The aim should be brief - one or two lines. |
|  | **Bias** | (data obtained in an experiment is ‘pushed’/changed in a way that makes the data invalid as it does not fully reflect the science/topic under investigation.)  Bias occurs when experimenter expectancies regarding study results bias the research outcome.Examples of experimenter bias include conscious or unconscious influences on subject behaviour including creation of demand characteristics that influence subjects, and altered or selective recording of experimental results themselves. [https://en.wikipedia.org/wiki/Bias] |
|  | **Blind/Double Blind experiment** | A testing procedure, designed to eliminate biased results, in which the identity of those receiving a test treatment is concealed from the subjects…in a **double blind experiment**, both administrators and subjects do not know who is receiving test or control treatment until after the study is completed by a third party. |
|  | **Control group** | A control group in a scientific experiment is a group separated from the rest of the experiment, where the independent variable being tested cannot influence the results. This isolates the independent variable's effects on the experiment and can help rule out alternative explanations of the experimental results. |
|  | **Conclusion/s** | A judgement/s or decision/s reached by reasoning. |
|  | **Controlled variable** | A controlled variable is one which the researcher holds constant (controls) during an experiment. ... If a control variable changes during an experiment, it may invalidate the correlation between the dependent and independent variable. When possible, control variables should be identified, measured, and recorded. |
|  | **Data** | The plural of datum; the measurement of an attribute, for example, the volume of gas or the type of rubber. This does not necessarily mean a single measurement: it may be the result of averaging several repeated measurements. Data may be quantitative or qualitative and be from primary or secondary sources. |
|  | 1. **Dependant** 2. **variable** 3. **(Responding variable)** | 1. A dependent variable is a variable whose value depends upon changes to the independent variable. The dependent variable is what is being measured in an experiment or evaluated in a mathematical equation. The dependent variable is sometimes called "the outcome variable." |
|  | 1. **Discussion** | The discussion section is probably the most difficult and challenging to write because you have to think carefully about   * the specific results you obtained in your experiment, * relate them to the aims, * interpret them * and generalise from them.   In this way you relate your own results to the store of scientific knowledge.  https://sydney.edu.au/science/molecular\_bioscience/report/BCHM2/discussion/discussion\_summary.html |
|  | 1. **Evaluation** | When the work is complete the whole investigation requires evaluation. Evaluation means looking at the work as a whole and determining if proper scientific conclusions can be made. |
|  | **Evidence** | In science, evidence is data that is considered reliable and valid and which can be used to support a particular idea, conclusion or decision. Evidence gives weight or value to data by considering its credibility, acceptance, bias, status, appropriateness and reasonableness. |
|  | **Field work** | Observational research undertaken in the normal environment of the subject of the study. |
|  | **Genre** | The categories into which texts are grouped; genre distinguishes texts on the basis of their subject matter, form and structure (for example, scientific reports, field guides, explanations, procedures, biographies, media articles, persuasive texts, narratives). |
|  | **Hypothesis** | A scientific statement based on the available information that can be tested by experimentation. When appropriate, the statement expresses an expected relationship between the independent and dependent variables for observed phenomena. |
|  | **Investigation** | A scientific process of answering a question, exploring an idea or solving a problem, that requires activities, such as planning a course of action, collecting data, interpreting data, reaching a conclusion and communicating these activities. Investigations can include observation, research, field work, laboratory experimentation and manipulation of simulations. |
|  | 1. **Independent variable (Manipulated variable)** | 1. A variable (denoted by *x*) whose variation does not depend on that of another. What it does depend on is a human purposely changing it in a way to see what effect/s it has in a predetermined situation. |
|  | **Law** | A statement describing invariable relationships between phenomena in specified conditions, frequently expressed mathematically. |
|  | 1. **Materials** | 1. The equipment and perisable materials used in an experiment to gain valid and reliable data. |
|  | **Measurement**  **error** | The difference between the measurement result and a currently accepted or standard value of a quantity. |
|  | **Media texts** | Spoken, print, graphic or electronic communications with a public audience. Media texts can be found in newspapers, magazines and on television, film, radio, computer software and the internet. |
|  | 1. **Method/s** | 1. Repeatable specific stepwise processes that need to be followed to gain valid and reliable data. |
|  | **Mode** | The various processes of communication – listening, speaking, reading/viewing and writing/creating. |
|  | **Model** | A representation that describes, simplifies, clarifies or provides an explanation of the workings, structure or relationships within an object, system or idea. |
|  | 1. **placebo** | a medicine or procedure prescribed to eliminate any psychological effects in taking a substance OR in carrying out a procedure. |
|  | **Primary data** | Data collected directly by a person or group. |
|  | **Primary source** | Report of data created by the person or persons directly involved in observations of one or more events, experiments, investigations or projects. |
|  | **Reliable data** | Data that has been judged to have a high level of reliability; reliability is the degree to which an assessment instrument or protocol consistently and repeatedly measures an attribute, achieving similar results for the same population. |
|  | **Reliability** | The degree to which an assessment instrument or protocol consistently and repeatedly measures an attribute, achieving similar results for the same population. Replicates, Repeat procedures, increasing sample size/s and averages provide the reliability in data. |
|  | **Representation** | A verbal, visual, physical or mathematical demonstration of understanding of a science concept or concepts. A concept can be represented in a range of ways and using multiple modes. |
|  | **Research** | To locate, gather, record, attribute and analyse information in order to develop understanding. |
|  | **Research**  **ethics** | Norms of conduct that determine ethical research behaviour; research ethics are governed by principles, such as honesty, objectivity, integrity, openness and respect for intellectual property and include consideration of animal ethics. |
|  | 1. **Results** | 1. An item or items of information obtained by experiment or some other scientific method; a quantity or formula obtained by calculation. |
|  | **Risk assessment**  **(in the school/ agricultural college context)** | Evaluations performed to identify, assess and control hazards in a systematic way that is consistent, relevant and applicable to all school activities. Requirements for risk assessments related to particular activities will be determined by jurisdictions, schools or teachers as appropriate. |
|  | **Secondary**  **data** | Data collected by a person or group other than the person or group using the data. |
|  | **Secondary**  **source** | Information that has been compiled from records of primary sources by a person or persons not directly involved in the primary event. |
|  | **Simulation** | A representation of a process, event or system which imitates a real or idealised situation. |
|  | **System** | A group of interacting objects, materials or processes that form an integrated whole. Systems can be open or closed. |
|  | **Theory** | A set of concepts, claims and/or laws that can be used to explain and predict a wide range of related observed or observable phenomena. Theories are typically founded on clearly identified assumptions, are testable, produce reproducible results and have explanatory power. |
|  | **Uncertainty** | Range of values for a measurement result, taking account of the likely values that could be attributed to the measurement result, given the measurement equipment, procedure and environment. |
|  | **Validity** | The extent to which tests measure what was intended; the extent to which data, inferences and actions produced from tests and other processes are accurate. |
|  |  | 1. Identify parts of microscope and provide their function |
|  |  | 1. Calculate lens magnification |
|  |  | 1. Calculate field of view |
|  |  | 1. Estimate cell size |