Lecture 1a-what is science

- Science is a standardised approach of collecting and gathering information and answering simple and complex questions in a manner such that errors and biases are minimised
- Science never proves theory, but the 'correctness' of the theory increases with more evidence
- Scientific process: whenever you are conducting science, you are standing at the shoulders of the 'experts' before you, e.g. psychologists using Darwin's theory
- Science relies upon observable data, e.g. our five senses, to test out theories
- Hard sciences-natural sciences (more certain, less complex): bio, physics, math, neuroscience → data is often very clearly observable; measuring size, weight
- Soft sciences-social sciences (less certain, more complex): social psychology, clinical psychology, social science, economics → have ambiguity in data
- A theory is a set of principles that explains and predict certain phenomena, e.g. earth revolves around the sun in a particular direction → things you can see with your 5 senses
- Constantly subject to testing, modification, and refutation as new evidence and ideas emerge
- To be 'accepted', a theory must be well-substantiated, i.e. multiple experiments and observations supporting the theory like the theory of gravity
- A hypothesis is making a prediction that can be tested in the real world and the behaviour/outcome the scientist is interested in must be measurable/observable
- A hypothesis is based on the theory a scientist is testing-the theory leads them to predict something, given that the theory is correct
- Hypothesis is a statement, e.g. the sun will rise in the East every morning
- Hypotheses must be testable, replicable (somebody can conduct the same experiment with the same hypothesis) and falsifiable (able to be shown to be incorrect)

Lecture 1b-what is science

- Main types of experiments:
    - True experiment
        - Seeks to reduce bias and error
        - Conducted to test theory and more specifically the hypotheses which are based on the theory and previous results of experiments
        - Require independent and dependent variable
    - Correlational study
        - Researchers try to show the relationship/correlation between two variables
        - Only have dependent variables
        - Only observing-not manipulating any variables
        - E.g. positive correlation: one event increases, the other increases
        - Does not tell causation, i.e. when A and B increases together, does not mean A causes B or vice versa, so needs a third variable
    - Quasi-experimental study

        - Research where subjects are selected based on a pre-existing condition, e.g. people who are depressed, anxious
        - E.g. effect of watching TV on DEPRESSED people
        - Still involve random allocation but not random selection because we select particular group of people with conditions. How to make up for this loss? Measure sex, age, wealth, etc.

    - Single case study
        - Investigate one individual case and write a report on it
        - You get a lot of quantitative and qualitative information
        - Considered less scientific, i.e. not relying upon sound statistical principles
- Operationalising: deriving a system whereby objective tangible measurement is possible, i.e. setting measurement for something abstract, e.g. love, sadness

Lecture 1c-what is science

- Bad science means having less constants
- Bad science has inappropriate/not 'fixed' control groups, e.g. A is allowed to drink a lot more than B vs. A is allowed to drink whereas B is not allowed at all
- Personal bias: scientific finding that occurs in the context of an individual or group of researchers attempting to manipulate or report (or not report) the outcome in a way which suits their bias
- Sampling bias: does not have enough people in the research, i.e. errors in conducting/designing/reporting the research