Scientific Method

The scientific method is a way of acquiring knowledge through experimentation.

It is designed to cancel out standard human biases in reasoning by encouraging reproducibility and cross-checking.

Scientists form hypotheses, or educated guesses, about aspects of the world, then test them.

These experiments must be readily reproducible, so that other scientists can cross-check the data.

After thorough testing, a hypothesis may be supported or contradicted by the data.
Key question = “problem”

Hypothesis: a testable explanation of a natural phenomenon.

-uses Inductive reasoning: arriving at a conclusion based on one’s observations.

Make a prediction based on the hypothesis: “If… then”.

-uses deductive reasoning: using a general idea (hypothesis) to make a conclusion.
**Controlled Experiment:** tests designed to support or falsify a prediction.

**Variables:**
characteristics/events/conditions that can differ among individuals or over time.

**Independent:** controlled by person doing experiment, evaluated for its effect on the…

**Dependent:** Observable result influenced by independent variable.

**Controlled variables:** all other conditions that are kept constant.

**Multiple Observations** can be made to test hypothesis also.
**Experimental group:** set of individuals with certain characteristic or receive certain treatment.

**Control group:** identical to experimental except for one independent variable- the characteristic or treatment being tested. Therefore any difference in results seen should be due to changing the variable.

**Data:** test results.

Can support or disprove hypothesis

**Repeatability:** by yourself and others