Science In The News

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Science

Main features Of Scientific Theories

• **Objectivity:** Do not depend on a particular point of view.
• **Systematicity:** Try to represent as many phenomena in a field as possible in a law that is as simple as possible.
• **Reproducibility:** A law is established only if it allows new phenomena to be predicted.

Epistemology

Epistemology	Epistemology is the study of knowledge.
A priori	Knowledge of logical truths and of abstract claims (non-empirical).
A posteriori	Knowledge known by experience (empirical).
Deduction	Theory→Hypothesis→Opservation→Confirmation
Induction	Opservation→Pattern→Hypothesis→Theory
Falsifiability	Each scientist should attempt to disprove their theory to continually prove it.

Scientific Method Steps

1. **Purpose:** State the Problem.
2. **Research:** Research the Topic.
3. **Hypothesis:** Formulate an Hypothesis.
4. **Experiment:** Test your Hypothesis.
5. **Analyze:** Analyze the experiment Data.
6. **Conclusion:** Compare the hypothesis to the experiment result.

Branches of Science

• Natural Sciences (Astronomy, Biology, Chemistry, Physics) • Social / Behavioral Sciences • Formal Sciences • Applied Sciences

Variables

Variables	anything that can change during an experiment.
Independent Variable	The variable that is controlled or manipulated by the experimenter.
Dependent Variable	The variable that is measured by the experimenter.
Control Group	The group that is not exposed to the independent variable.

Common Pitfallsin Science and Science Communication

Correlation vs Causation	A **correlation** between 2 variable does not alway mean one **cause** the other.
Unsuported Conclusion	studies should be clear on the factes the study proves, and wich conclusion are unsuported.
Sample size problem	In trial, the smaller a sample size, the lower the confidence in the result from that sample.
Unrepresantative Sample used	If the sample is different from the population the confidence in the result from that sample.
No control group	Without a comparison group, we cannot separate intervention effects from other influences.
No blind testing used	Subjects should not know if they if they are in the test or control group.
Sensationalised headline	Articles headline are commonly designed to entice viewers into reading it. This can over-simplifie findings or misrepresent them.
Misinterpreted results	News article can misinterpret the findings of research for the sake of good story.
conflict of Interest	Research and data being misinterpret for finantial or personal reasons.
Selective reporting of data	Selecting data from result wich support the conclusion of the research, while ignoring those that do not.
Unreplicated results	Results should be replicable by independent research, and tested over wide ranges of conditions.
Non-peer reviewed material	Other scientes appraise and critique studies, before publication in a journal.

Ethics

Ethic	Ethics is defined as the study of morality.
Morality	a system of rules for guiding human conduct.
Directives	rules that guide our actions.
Micro-ethic	ethical issues at the level of individual decisions and professional conduct.
Macro-ethic	ethical issues at the societal or policy level concerning the collective impacts of science and technology.

Critical analysis