Scientific Research

What is **scientific research?**

scientific research

(1) it contributes to a body of science, and
(2) it follows the scientific method.

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Given that theories (based on laws) and observations are the two pillars of science, **scientific research** operates at two levels: a **theoretical** level and an **empirical** level.

Scientific Research (at a **theoretical** level)

The theoretical level is concerned with developing abstract concepts about a natural or social phenomenon

Scientific Research (at an **empirical** level)

The empirical level is concerned with testing the theoretical concepts and relationships to see how well they reflect our observations of reality, with the goal of ultimately building better theories.

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Over time, a theory becomes more and more refined (i.e., fits the observed reality better), and the science gains maturity.

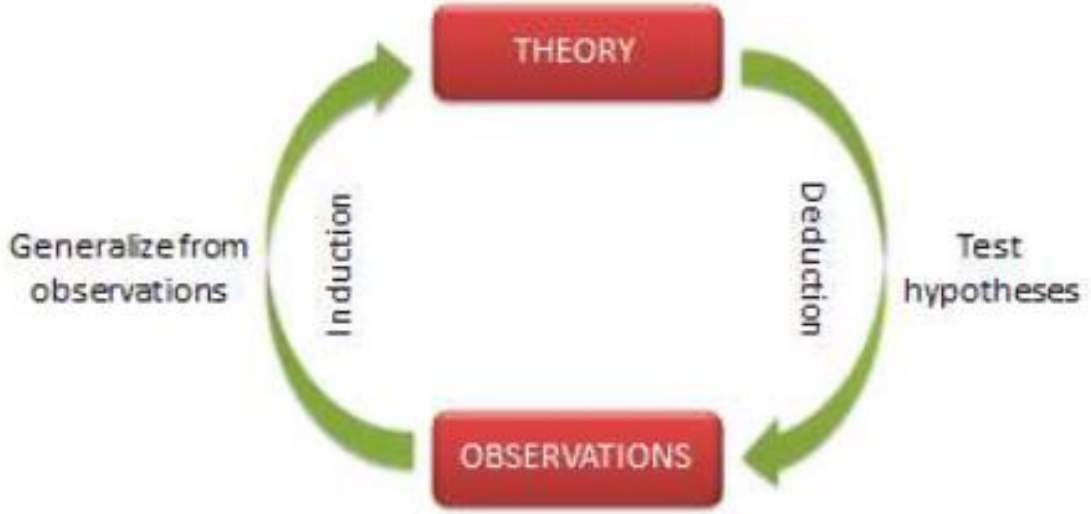
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Scientific research involves continually moving back and forth between theory and observations.
Both, theory and observations, are essential components of scientific research.

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Relying solely on observations for making inferences and ignoring theory is not considered valid scientific research

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inductive research (*theory-building* research) researcher is to infer theoretical concepts and patterns from observed data.

deductive research (*theory-testing* research) - the goal of the researcher is to test concepts and patterns known from theory using new empirical data, and to refine, improve and extend it (theory).

inductive and **deductive research** are two halves of the research cycle that constantly iterates between theory and observations

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Conducting scientific research, therefore, requires two sets of skills – theoretical and methodological – needed to operate in the theoretical and empirical levels respectively.