Research Basics

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The research process deals with the ways and strategies used by researchers to understand the world around us. This is a guide to basic elements of scientific research.

Research Basics

- **Research Methods** [1]
  - Formulating questions, collecting data, testing hypotheses

- **Experimental Research** [2]
  - Setting up experiments
What is Research?

What is Empirical Research?

What is the Scientific Method?

Definition of Research

Definition of the Scientific Method

Definition of Science

Steps

Steps of the Scientific Method - The scientific method has a similar structure to an hourglass - starting from general questions, narrowing down to focus on one specific aspect, then designing research where we can observe and analyze this aspect.

At last, the hourglass widens and the researcher concludes and generalizes the findings to the real world.
Aims of Research

The general aims of research [16] are:

- **Observe** [17] and Describe
- **Predict** [18]
- Determination of the **Causes** [19]
- **Explain**

Purpose of Research [20] - Why do we conduct research? Why is it necessary?

Elements of Research

Common **scientific research elements** [21] are:

Characterization - How to understand a phenomenon

- Decide what to **observe** [22] about a phenomenon
- How to define the **research problem** [13]
- How to **measure** [23] the phenomenon

**Hypothesis** [24] and **Theory** [25]

- The research questions [13] before performing research
- Almost always based on previous research
**Prediction** [18]

- What answers do we expect?
- **Reasoning** [26] and logic on why we expect these results

**Observation** [17] or **Experimentation** [2]

- Testing characterizations, hypothesis [27], theory and predictions
- Understanding a phenomenon better
- **Drawing Conclusions** [14]

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[1] https://explorable.com/research-methodology
[3] https://explorable.com/research-designs
[5] https://explorable.com/what-is-research
[8] https://explorable.com/what-is-the-scientific-method
[9] https://explorable.com/definition-of-research
[12] https://explorable.com/steps-of-the-scientific-method
[15] https://explorable.com/what-is-generalization
[16] https://explorable.com/aims-of-research
[17] https://explorable.com/observational-study
[18] https://explorable.com/prediction-in-research
[20] https://explorable.com/purpose-of-research
[21] https://explorable.com/scientific-elements
[22] https://explorable.com/operationalization
[23] https://explorable.com/scientific-measurements
[24] https://explorable.com/research-hypothesis
[26] https://explorable.com/scientific-reasoning
[27] https://explorable.com/hypothesis-testing