

## 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.



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## Research Basics



[1]

### Research Methods <sup>[1]</sup>

Formulating questions, collecting data, testing hypotheses



[2]

### Experimental Research <sup>[2]</sup>

Setting up experiments



[3]

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### Research Designs [3]

Different types of designs used in research



[4]

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### Statistics in Research [4]

A guide to statistics in research.

## What is Research?

What is Research? [5]

Basics of the Scientific Method [6]

What is Empirical Research? [7]

What is the Scientific Method? [8]

Definition of Research [9]

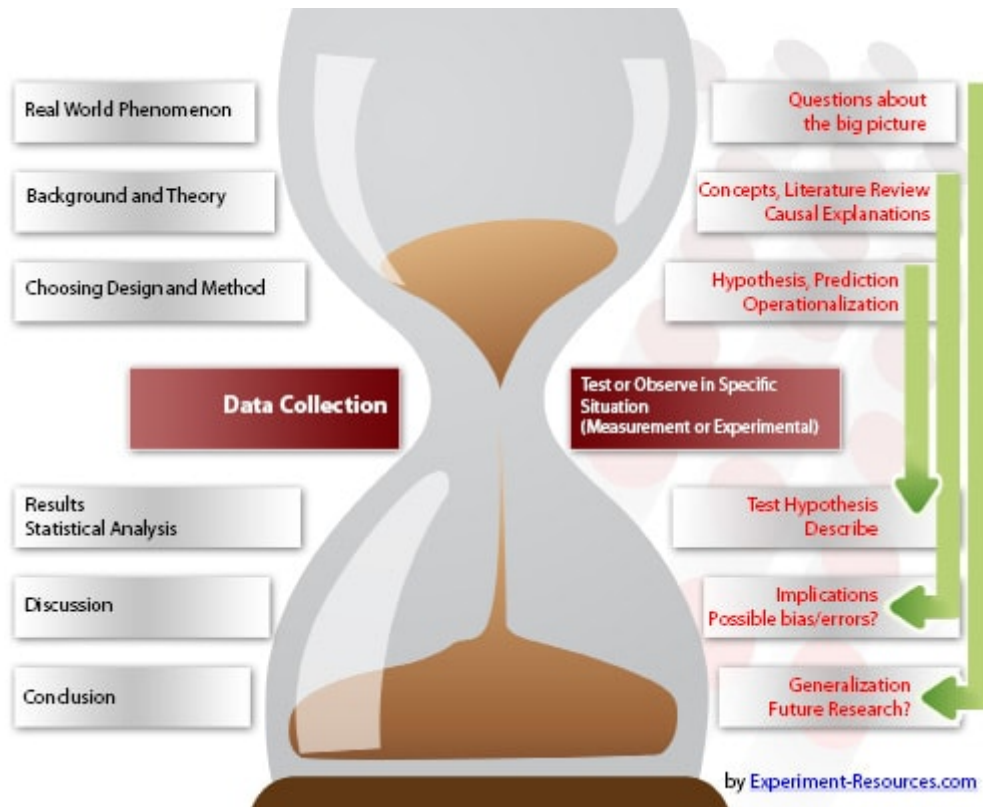
Definition of the Scientific Method [10]

Definition of Science [11]

## Steps

Steps of the Scientific Method [12] - The scientific method has a similar structure to an hourglass - starting from general questions, narrowing down to focus on one specific aspect [13], then designing research where we can observe and analyze this aspect.

At last, the hourglass widens and the researcher concludes [14] and generalizes [15] the findings to the real world.



## Aims of Research

The general aims of research <sup>[16]</sup> are:

- Observe <sup>[17]</sup> and Describe
- Predict <sup>[18]</sup>
- Determination of the Causes <sup>[19]</sup>
- Explain

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

## Elements of Research

Common scientific research elements <sup>[21]</sup> are:

Characterization - How to understand a phenomenon

- Decide what to observe <sup>[22]</sup> about a phenomenon
- How to define the research problem <sup>[13]</sup>
- How to measure <sup>[23]</sup> the phenomenon

Hypothesis <sup>[24]</sup> and Theory <sup>[25]</sup>

- The research questions <sup>[13]</sup> before performing research
- Almost always based on previous research

## Prediction <sup>[18]</sup>

- What answers do we expect?
- Reasoning <sup>[26]</sup> and logic on why we expect these results

## Observation <sup>[17]</sup> or Experimentation <sup>[2]</sup>

- Testing characterizations, hypothesis <sup>[27]</sup>, theory and predictions
- Understanding a phenomenon better
- Drawing Conclusions <sup>[14]</sup>

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### **Links**

- [1] <https://explorable.com/research-methodology>
- [2] <https://explorable.com/experimental-research>
- [3] <https://explorable.com/research-designs>
- [4] <https://explorable.com/statistics-tutorial>
- [5] <https://explorable.com/what-is-research>
- [6] <https://explorable.com/scientific-method>
- [7] <https://explorable.com/empirical-research>
- [8] <https://explorable.com/what-is-the-scientific-method>
- [9] <https://explorable.com/definition-of-research>
- [10] <https://explorable.com/definition-of-the-scientific-method>
- [11] <https://explorable.com/definition-of-science>
- [12] <https://explorable.com/steps-of-the-scientific-method>
- [13] <https://explorable.com/defining-a-research-problem>
- [14] <https://explorable.com/drawing-conclusions>
- [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>
- [19] <https://explorable.com/cause-and-effect>
- [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>
- [25] <https://explorable.com/truth-and-theory>
- [26] <https://explorable.com/scientific-reasoning>
- [27] <https://explorable.com/hypothesis-testing>