

The Research Process in 10 Steps

Experimental Sciences



1. Observation

The observation of any phenomenon is the first step when you plan any research. Observe the events and phenomena occurring around you.

2. Research question or initial hypothesis

Once you have observed a phenomenon you must propose a well-focused research question. To answer it is the aim of the research process.



3. Exploration

Search for any appropriate and relevant background information related to the phenomena you are researching to enhance the understanding of the context.



4. Definition of variables

Identify the variables playing a role in your research. You must define the independent, dependent and controlled ones.



5. Experimentation

Establish an appropriate methodology to address the research question. You must take measurements of different variables and collect data.



6. Analysis

Analyse the qualitative and/or quantitative collected data to support detailed and valid conclusions to the research question. Data could be processed and shown as graph, tables, statistics...



7. Conclusions

Extract your conclusions about your experimentation and the collected data after making the analysis.

8. Evaluation

Evaluate the research question or the initial hypothesis by using your conclusions. You must check whether the conclusions of your results fit the research question or the initial hypothesis. If so, you can move to the following step. If not, you must modify the research question or the hypothesis, and start again on step 2.

When a hypothesis is widely supported it could reach the status of a theory.

9. Improvements, suggestions and extension

Your research has not finished yet. Propose suggestions for the improvement and the extension of your research that can help future research and other researchers.

10. Communication

Your research is not finished until you publish it by writing a paper or scientific report, and disseminating it through scientific journals, a website, social media, etc... To assess its validity, quality and originality it will be first reviewed by specialists in the same research area in a process called "peer review".

Don't forget to mention all the sources and authors consulted to help you with your work.

Why should I care?

Following and respecting each of these steps makes your research work trusted and recognised.

For more information:
<https://path2integrity.eu/ri-materials>

Credits: Jordi Mazón Bueso, PhD in Physics, teacher and researcher in atmosphere physics, Polytechnical University of Catalonia.

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