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Purpose of Research ^[1]

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The purpose of research can be a complicated issue and varies across different scientific fields and disciplines. At the most basic level, science can be split, loosely, into two types, 'pure research' and 'applied research'.

Both of these types follow the same structures and protocols for propagating and testing hypotheses ^[3] and predictions, but vary slightly in their ultimate purpose.

An excellent example for illustrating the difference is by using pure and applied mathematics. Pure maths is concerned with understanding underlying abstract principles and describing them with elegant theories. Applied maths, by contrast, uses these equations to explain real life phenomena, such as mechanics, ecology and gravity.

Pure Scientific Research

Some science, often referred to as 'pure science', is about explaining the world around us and trying to understand how the universe operates. It is about finding out what is already there without any greater purpose of research than the explanation itself. It is a direct descendent of philosophy, where philosophers and scientists try to understand the underlying principles of existence.

Whilst offering no direct benefits, pure research often has indirect benefits, which can contribute greatly to the advancement of humanity.

For example, pure research into the structure of the atom has led to x-rays, nuclear power and silicon chips.

Applied Scientific Research

Applied scientists might look for answers to specific questions that help humanity, for example medical research or environmental studies. Such research generally takes a specific question and tries to find a definitive and comprehensive answer.

The purpose of research is about testing theories, often generated by pure science, and applying them to real situations, addressing more than just abstract principles.

Applied scientific research can be about finding out the answer to a specific problem, such as 'Is global warming avoidable?' or 'Does a new type of medicine really help the patients?'

Generating Testable Data

However, they all involve generating a theory to explain why something is happening and using the full battery of scientific tools and methods to test it rigorously.

This process opens up new areas for further study and a continued refinement of the hypotheses.

Observation [4] is not accurate enough, with statistically testable [5] and analyzable data the only results accepted across all scientific disciplines. The exact nature of the experimental process may vary, but they all adhere to the same basic principles.

Scientists can be opinionated, like anybody else, and often will adhere to their own theories, even if the evidence shows otherwise. Research [6] is a tool by which they can test their own, and each others' theories, by using this antagonism to find an answer and advance knowledge.

The purpose of research is really an ongoing process of correcting and refining hypotheses [7], which should lead to the acceptance of certain scientific truths [8].

Whilst no scientific proof can be accepted as ultimate fact, rigorous testing ensures that proofs can become presumptions. Certain basic presumptions are made before embarking on any research project, and build upon this gradual accumulation of knowledge.

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[1] <https://staging.explorables.com/purpose-of-research>

[2] <https://staging.explorables.com/en>

[3] <https://staging.explorables.com/hypothesis-testing>

[4] <https://staging.explorables.com/observational-study>

[5] <https://staging.explorables.com/significance-test>

[6] <https://staging.explorables.com/what-is-research>

[7] <https://staging.explorables.com/research-hypothesis>

[8] <https://staging.explorables.com/truth-and-theory>