



What is Scientific Research & Why It Matters

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Introduction

- What comes to your mind when you hear the word “research”?
- *Have you ever Googled your symptoms before going to a doctor?*
- Used in daily life



What is Scientific Research?

- **Definition:**

Scientific research is a **systematic, organized process** used to investigate problems and generate new knowledge.



What is Scientific Research?

➤ Core Elements:

- Observation
- Questioning
- Experimentation
- Analysis
- Conclusion

➤ Simple Example:

“Does studying with music improve focus?”

Research is not
guessing—it's
**evidence-based
thinking.**



Characteristics of Scientific Research

1. Systematic (step-by-step process)
2. Objective (unbiased)
3. Empirical (based on data)
4. Reproducible (others can verify results)



Scientific Method



IDENTIFY A PROBLEM



FORM A HYPOTHESIS



CONDUCT EXPERIMENTS



ANALYZE DATA



DRAW CONCLUSIONS



THE METHOD
ENSURES **ACCURACY**
AND CREDIBILITY.

Why Scientific Research Matters

1. Advances Knowledge

Expands what we know about the world

2. Drives Innovation

Technology, AI, medicine, engineering

3. Improves Healthcare

Vaccines, treatments, disease prevention

4. Solves Real-World Problems

Climate change 

Energy 

Food security 

5. Supports Decision-Making

Governments use research for policies

Businesses use data for strategy

Example:

COVID-19 vaccines → result of scientific research

Real-Life Applications

Examples:

- Smartphones 
- Internet 
- Medical imaging (X-rays, MRI)
- Self-driving cars 
-  **Message:**
“You are surrounded by research outcomes every day.”

Challenges in Scientific Research



TIME-CONSUMING



EXPENSIVE



REQUIRES
ACCURACY AND
ETHICS



MANAGING
COMPLEX DATA

Types of Research



Basic / Fundamental

Driven by curiosity.
Expands theoretical knowledge without immediate application.
e.g. Why do black holes emit radiation?



Applied Research

Solves specific real-world problems using existing knowledge.
e.g. Developing a cheaper solar panel



Quantitative

Deals with numbers, statistics, and measurable data.
e.g. Survey of 500 students on study habits



Qualitative

Explores meanings, experiences, and perspectives in-depth.
e.g. Interviews about student anxiety



Mixed Methods

Combines quantitative and qualitative approaches for richer insight.
e.g. Survey + focus groups on learning

Research in Numbers

2.9M

Research papers
published every year

\$2.4T

Global annual investment
in research & development

80%

Of modern medicines
originated from basic
research

≈100

Years from
discovery to smartphone



The internet, GPS, touchscreens, and vaccines all began as someone asking a question nobody had answered before.

— History of Science

Who Can Do Research?



*Research has no
age limit, nationality,
or background.*

Myth vs Reality

✗ Only professors do research

✗ You need a lab to do research

✗ Research is only for STEM

✗ You must be a genius

✓ Students at every level can and do conduct research

✓ Research can be done with surveys, interviews, or data analysis

✓ History, literature, law, and art all have active research fields

✓ Curiosity + method matters far more than raw intelligence

Ethics

Honesty

Integrity

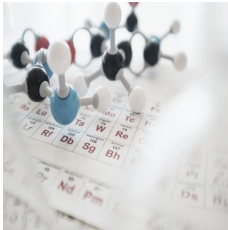
Objectivity

Respect for
Participants

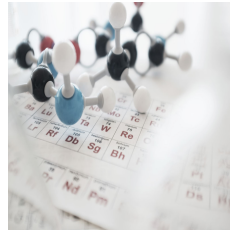
Avoid Harm

Proper
Acknowledgment

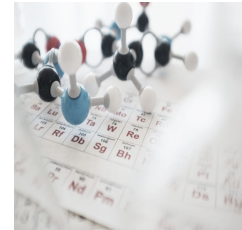
Impact



Medicine

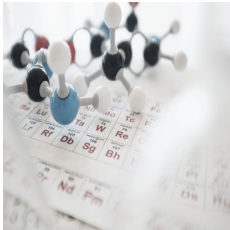


Environment

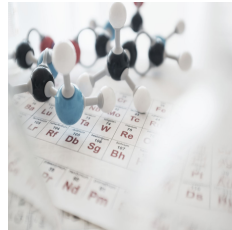


Education

Innovation



Smartphones

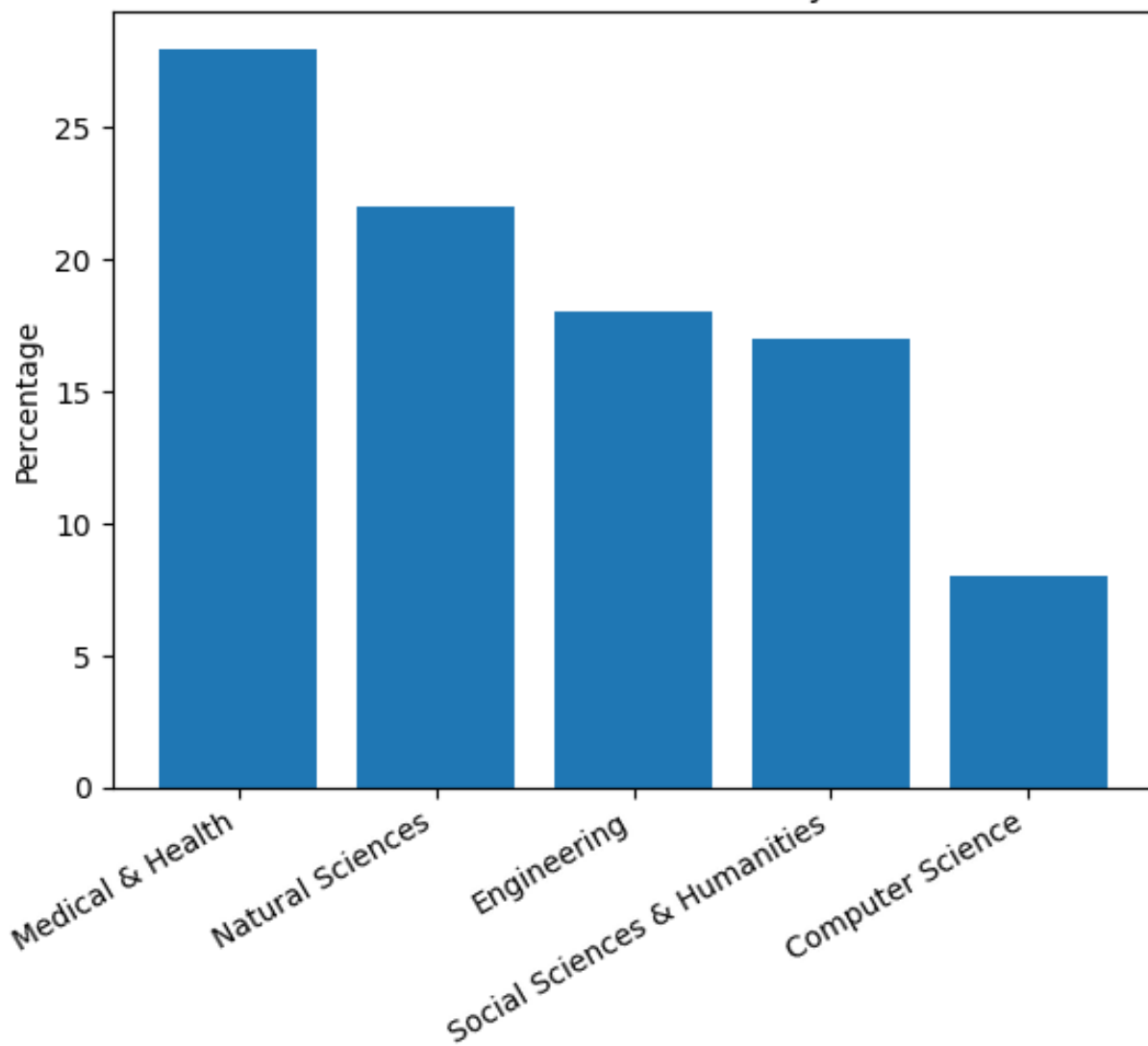


Internet



Energy

Global Research Distribution by Field (%)



Conclusion



Scientific research is the **engine of progress**



It helps us **understand, innovate, and solve problems**



“Every major advancement in human history started with a question—and the courage to investigate it.”



THANK YOU



QUESTIONS