



# Organization and planning of scientific research

Lecture 2

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# Lecture 2

Science. Its features and structure

# What is science?

## The Short Answer:

Science consists of observing the world by watching, listening, observing, and recording. Science is curiosity in thoughtful action about the world and how it behaves.

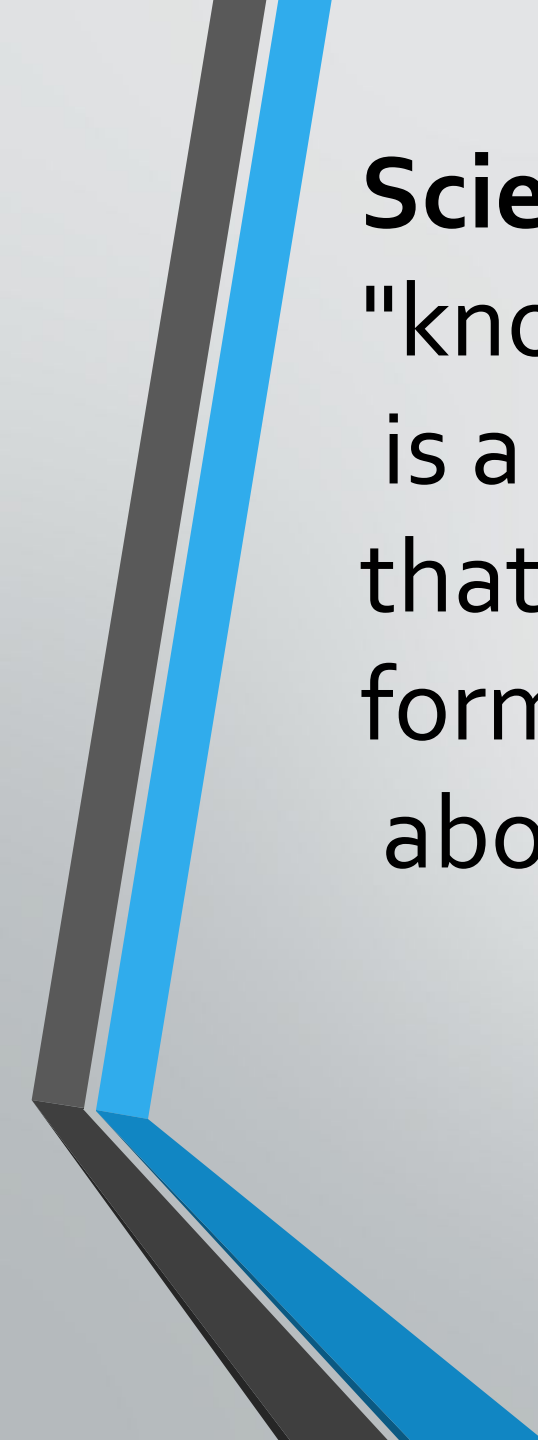
## Science is . . .

- Observing the world.
- Watching and listening
- Observing and recording.

Science is **curiosity in thoughtful action** about the world and how it behaves.

Anyone can think like a scientist.



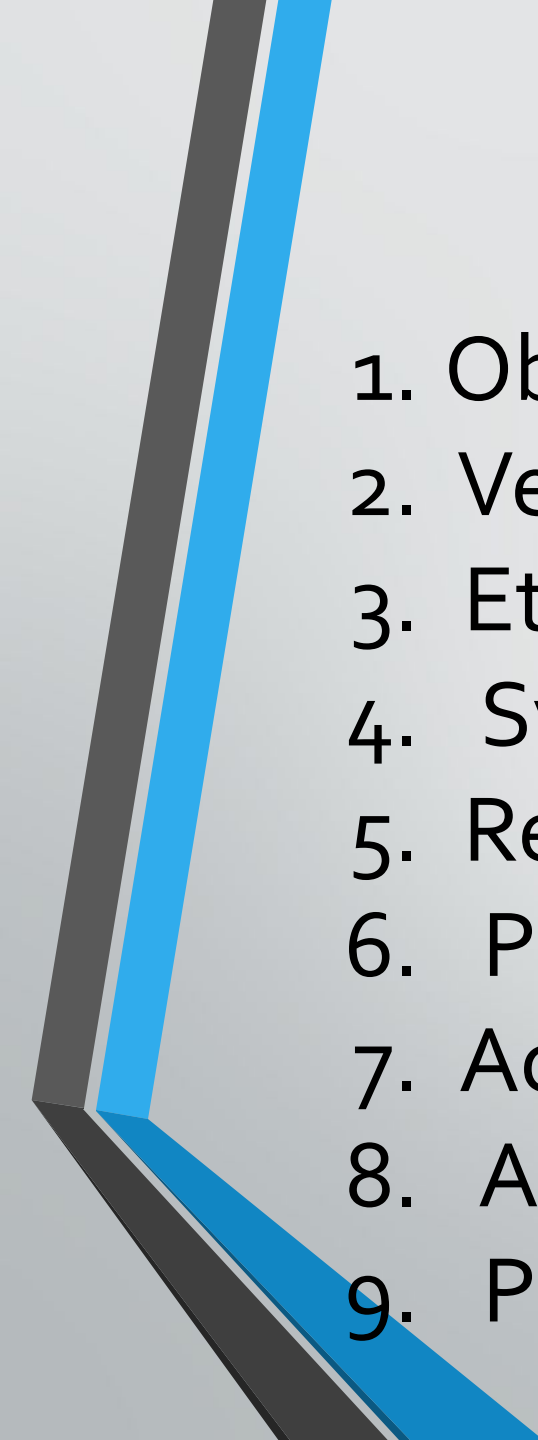


**Science** (from the Latin word *scientia*, meaning "knowledge")

is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe

# Structure of science

	Science		
	Empirical sciences		Formal science
	Natural science	Social science	
Basic	Physics, chemistry, biology, earth science, and space science	Anthropology, economics, political science, sociology, human geography, and psychology	Logic, mathematics, and statistics
Applied	Engineering, agricultural science, medicine, and materials science	Business administration, public policy, marketing, law, pedagogy, and international development	Computer science



# Features of science

1. Objectivity
2. Verifiability
3. Ethical Neutrality
4. Systematic Exploration
5. Reliability
6. Precision
7. Accuracy
8. Abstractness
9. Predictability.



## Science assumes that

- A) natural processes are universal.
- B) each process is particular to the individual system being observed.

## Key Concepts

- Science consists of a body of knowledge and the process by which that knowledge is developed.
- The core of the process of science is generating testable explanations, and the methods and approaches to generating knowledge are shared publicly so that they can be evaluated by the community of scientists.
- Scientists build on the work of others to create scientific knowledge.
- Scientific knowledge is subject to revision and refinement as new data, or new ways to interpret existing data, are found.







Logical thinking is \_\_\_\_\_ part of the creative thinking.

- A) always part of
- B) unrelated to



Creative scientists are able to

- A) make up stories to explain everything.
- B) imagine multiple ways to investigate a question .

## Key Concepts

- Some of the most important questions in science are either too large or too complex to answer directly, so scientists break them down into smaller, solvable questions.
- Many times, the questions that scientists research involve the simplest cases.
- Scientists use creativity to determine which smaller questions are likely to yield results, imagine possible answers to their questions, and devise ways to test those answers.
- To be creative, scientists need background knowledge, which they gain by learning about past scientific work, talking to colleagues, and tapping their own experience.



# Questions:

1. What is science?
2. What are main characteristics of science?