

# What is Scientific Inquiry?

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- Science is based on two assumptions.
  1. The natural world behaves in a consistent and predictable manner.
  2. Through careful, systematic study, we can understand and explain the natural world's behavior.
- With this knowledge and knowing how oil deposits are formed, geologists can predict where oil can be found.
- Skepticism is a willingness to question an idea unless that idea is supported with firm evidence.

# A Hypothesis

- **Hypothesis**, a tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation.
- Once data have been gathered, scientists try to explain how or why things happen in the manner observed.
- Before a hypothesis can be accepted by the scientific community, it must be tested and analyzed.
- If a hypothesis can't be tested, it is not scientifically useful.
- If a hypothesis fails a rigorous testing, it is discarded.

# A Theory

- If a hypothesis survived extensive testing and competing hypothesis have been eliminated, it may become a scientific theory.
- A scientific theory is well tested and widely accepted by the scientific community and best explains certain observable facts.
- A theory is still open for scrutiny. It is possible that someone will find evidence that disproves it.
- Scientific **laws** are different from theories. Laws are generalizations about how the natural world behaves under certain conditions. Law of gravity.
- Humans don't create the laws: they discover them. Theories grow from laws, they become laws after further testing and are proven true.

# Scientific Method

1. A collection of facts through observation and measurement.
2. Development of one or more hypotheses to explain facts.
3. Development of experiments to test hypotheses.
4. Collect and analyze data.
5. Draw conclusions and accept or reject hypotheses based on extensive testing.