

Study Guide For Meaningful Science



Science is a **systematic** approach to learning about **how the natural world works**.
Science comes from the Latin word, *scientia*, which means “**knowledge**.”

The Limitations of Science

Science is a powerful tool, but there are limits to what it can be used for.

Science *cannot*:

- ✓ **Define** Science. (This is a task for philosophy.)
- ✓ Provide the **motivations** to do science. (Here at UDJ we do science to satisfy our curiosity, to develop technology that benefits the creation, and to glorify God.)
- ✓ Tell us how we **ought** to use the knowledge and technology we gain from science.
- ✓ Explain many of the most important things that exist in our lives, such as love, logic, math, good and evil, and many other **non-material things**.

The Scientific Method

1. Observe a **problem**.
2. Form a **hypothesis** attempting to answer the problem.
3. **Test** your hypothesis with a controlled experiment.
4. Make **observations** and collect **data**.
5. **Analyze** observations and perform **calculations**.
6. Form **conclusions** about your hypothesis.

The Characteristics of Science

Ideally an experiment is concerned with what is:

- ✓ **Empirical** (Can be observed with the 5 senses.)
- ✓ **Testable/Falsifiable** (Can be theoretically proven false using the scientific method.)
- ✓ **Tentative** (Conclusions are subject to change with new observations.)
- ✓ **Mathematical** (Can be described using mathematical natural laws.)

The Assumptions of Science

To make **empirical** observations you must assume:

- ✓ Nature is real.
- ✓ Your senses are reliable.
- ✓ You can choose what to observe and what to ignore.

To be **falsifiable and tentative** you must assume:

- ✓ You can't simply predict the order in nature, but rather you must go out and see for yourself. (In other words, we need to experiment!)
- ✓ We are limited in our abilities to observe and understand how nature works.

To be **mathematical** you must assume:

- ✓ Nature is orderly, so orderly that you can describe it with simple, elegant formulas.
- ✓ We can discover and understand the order in nature.
- ✓ The order we observe here and now applies to other times and places. (Uniformitarianism)
- ✓ Nature is not divine. It doesn't have a mind or will of its own that changes over time.
- ✓ Nature is not under the rule of many gods, each with their own domains.

The Christian Heritage of Modern Science

It was no accident that modern science was born out of a culture which was saturated with the Christian worldview. Christianity perfectly provides the motivations and philosophical assumptions listed above.

Motivations

- ✓ **Knowledge:** We believe that any knowledge gained will never go to waste. You are not merely a little blip in time that will soon be forgotten. What you learn now can effect eternity.
- ✓ **Technology that benefits creation:** God commanded Adam to “be fruitful and multiply,” to “subdue the earth” and to have dominion over land, sea and sky. God also commanded Adam to name the animals (zoology) and to care for the garden (botany).
- ✓ **The Glory of God:** The Bible is filled with phrases like, “The heavens declare the glory of God...” Psalm 19:1 Not only that, but many if not most of the greatest minds in modern science have been men and women seeking to “think God’s thoughts after Him” and to read “the book of God’s works.” (See below.)

Assumptions

To make **empirical** observations you must assume:

- ✓ Nature is real.
- ✓ Your senses are reliable.
- ✓ You can choose what to observe and what to ignore.

The Bible says humans are created in the image of God with the ability to think, to reason, to question, and to know right from wrong. (See Genesis 1:27)

To be **falsifiable and tentative** you must assume:

- ✓ You can’t simply predict the order in nature, but rather you must go out and see for yourself. (In other words, we need to experiment!)
- ✓ We are limited in our abilities to observe and understand how nature works.

The Bible says God created the Universe *ex nihilo*, out of nothing. (See Hebrews 11:3 and Revelation 4:11) He could have created nature any way He pleased. He didn’t have to create the Universe at all, let alone in a particular way. So we must go out and see how He actually did it. Additionally, the Bible acknowledges that humans are limited in their ability to observe and understand how nature works. “For my thoughts are not your thoughts, neither are your ways my ways, says the Lord. For as the heavens are higher than the earth, so are my ways higher than your ways, and my thoughts than your thoughts.” (Isaiah 55:8-9)

To be **mathematical** you must assume:

- ✓ Nature is orderly, so orderly that you can describe it with simple, elegant formulas.
- ✓ We can discover and understand the order in nature.
- ✓ The order we observe here and now applies to other times and places. (Uniformitarianism)
- ✓ Nature is not divine. It doesn’t have a mind or will of its own that changes over time.
- ✓ Nature is not under the rule of many gods, each with their own domains.

The Bible says there is one God who made all things and who sustains it at every moment. God is a mind, all-knowing and all-powerful.

God is not nature, He is supernatural. He existed from all eternity and then chose to bring the Universe into existence out of nothing.