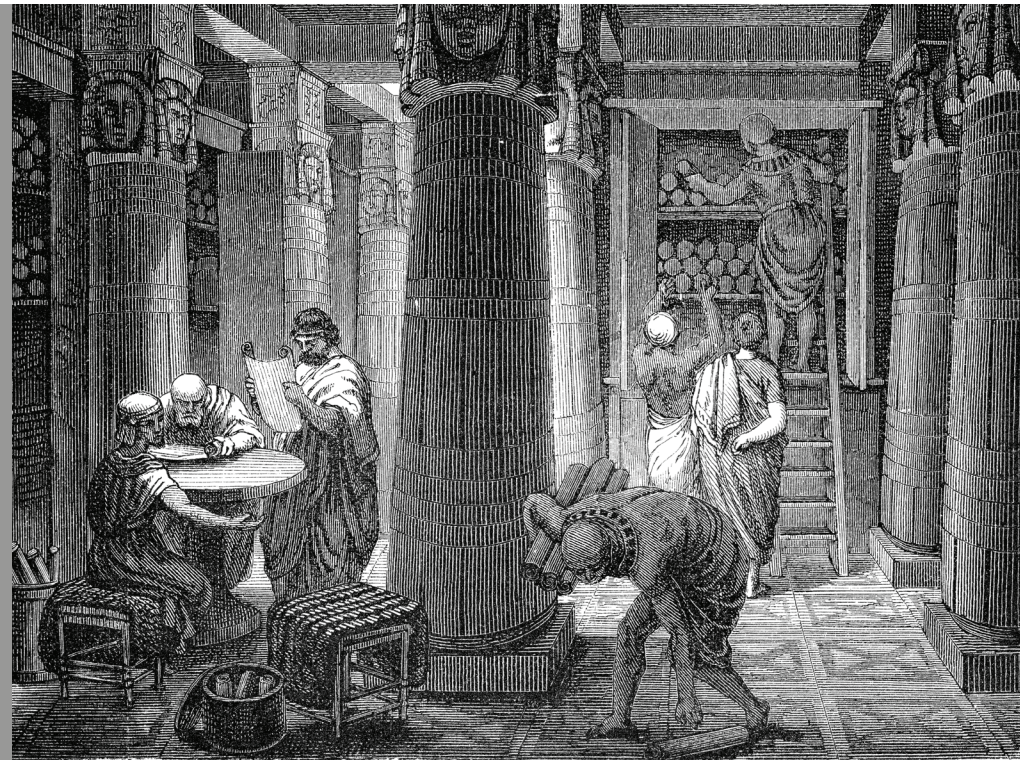


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Approaches to Knowledge



By Bob Bain, adapted by Newsela

How do people create knowledge? It starts by being puzzled, curious, or even confused about the world. There's a sense of wonder in it all.

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BIG HISTORY PROJECT

I'm writing about knowledge here in a library. I'm surrounded by books. A library is a good place to write about knowledge. Libraries hold our collective learning. That is why communities build them. The idea of collective learning is very important in the Big History course.

Libraries hold knowledge of many kinds: books, maps, movies, CDs, and of course, textbooks.

The Big History class does not have a textbook. But it's still useful to think about textbooks and the knowledge they contain.

Most of my students ask just one big question about their textbooks. "How can I get the facts out of the textbook and onto the test?" That was the same question I asked when I was a student.

Big History asks questions about knowledge

In Big History, we ask a very different question: "How did that knowledge get into the textbook?" We want to find out how people came up with the facts or ideas that are in our textbooks.

Did you ever wonder how people create knowledge? In this course you will meet many scientists who created the information that is in your textbooks.

They are excited to tell you what they have learned. But they are also excited to tell you how they learned it.

In Big History we want you to pay attention to the questions these scientists ask. Also, pay attention to the tools and evidence they use to answer their questions.

Questions, tools, and evidence

How do scholars create or discover ideas, facts, and knowledge? They use questions, tools and evidence. Most begin their investigations with questions. They are curious about the world around them.

Textbooks place questions at the end of learning. Scholars ask the questions first. They use questions to drive their learning forward.

Have you noticed that the Big History course uses big questions to begin your study?

Before investigating a question, scholars make a thoughtful guess about what they'll



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learn. We call these thoughtful guesses “conjectures” or “hypotheses.” Scholars need to gather information to answer their questions. Sometimes people create or use new tools to help them gather new information. For example, Galileo made a telescope to collect new data about the planets.

Scholars turn information into evidence to support claims

Once scholars gather information, their job is just beginning. They must organize the information and analyze it. They must see if it answers their questions. Scholars may then make claims that answer their questions. They use the information as evidence to support their claims. With strong evidence, a claim may enter a textbook, where others can learn about it.

Scholars must show how they answered their questions

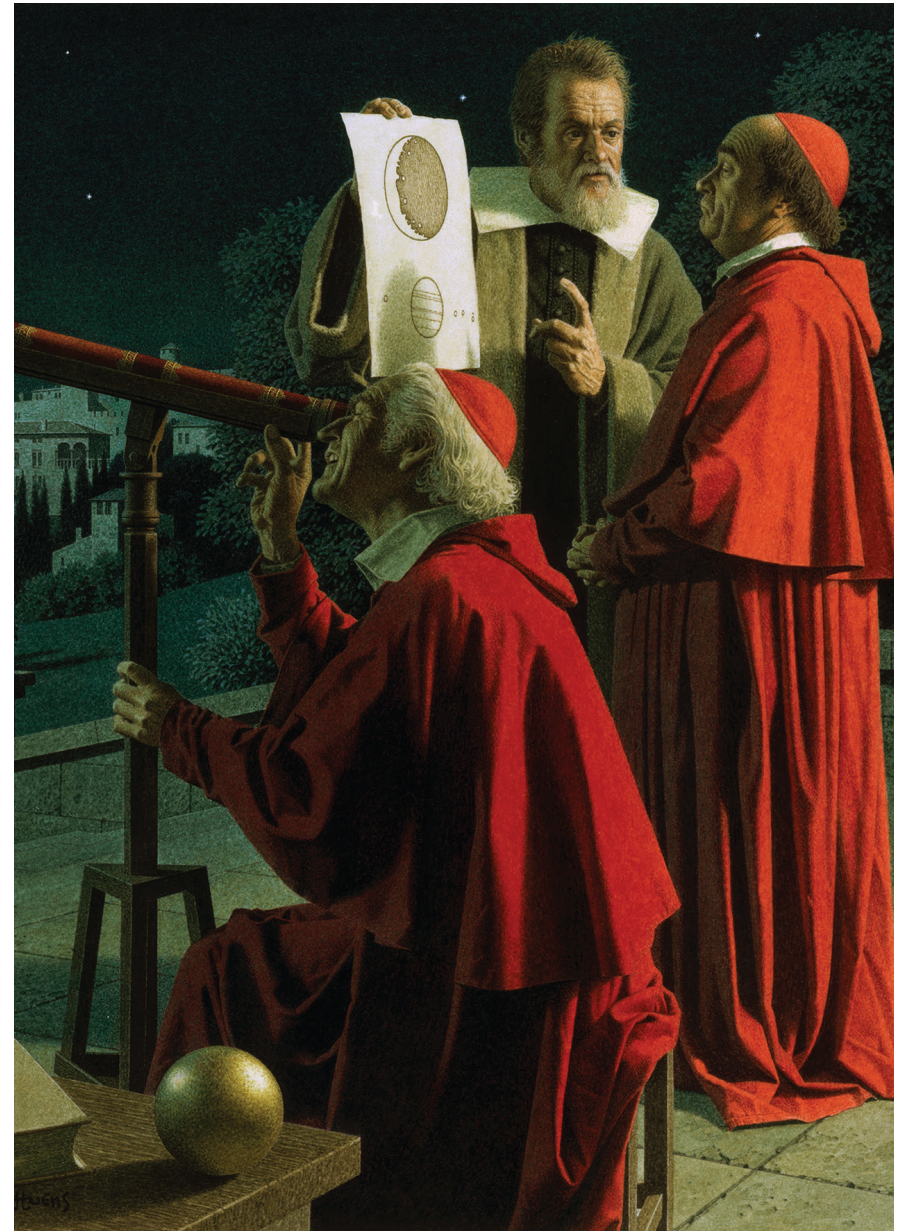
Let’s review. In this essay, I wondered how knowledge gets in textbooks. In answer to my question, I described a few steps:

- First, scholars have a question or they are curious or puzzled about something.
- Second, they make a thoughtful guess.
- Next, they gather information to answer the question, often using new tools.
- They then study the information, think about it, and perhaps use some of it to answer their question.
- Scholars use information as evidence to support their claims.
- When claims become well supported, they enter textbooks for students to learn.

But scholars must also show how they learned this new information. They must explain what questions they asked, how they answered them, what information they gathered.

Scholars want to add to our collective learning. They want people to see how they arrived at their claims and what evidence supports the claims. They do not want people to trust them just because they are scholars or scientists.

Scholars also want others to improve their claims. This might mean using new tools to gather new evidence. It might mean asking a different question entirely.



A painting of Galileo explaining observations made with his telescope

Different approaches to knowledge

All scholars ask important questions, from archaeologists to zoologists. They all begin asking questions, but they ask different questions. They all gather data, but they gather data differently.

As you meet the instructors in this course, don't just learn what they are teaching. Try to understand how they do their work. What questions do they ask? How do they answer them?

You might ask them:

- What are the big questions that have interested you?
- What were your guesses, speculations, and hypotheses?
- How did you collect your evidence?
- Where did you see the patterns in your evidence?
What did those patterns seem to show?
- What were your biggest ideas?
- How did you make your ideas public?
- Why should others believe your ideas?
- When and why have you changed your mind?

Make sure to pay attention to big questions that haven't been answered. These are questions that you and your friends might take up. Who knows? Maybe you can add to the textbooks of the future.

Big History's approach to knowledge

In Big History we ask lots of big questions. We're going to ask questions about the physical world, the living world, and the human world. We will need to use many different approaches to knowledge.

The ideas we use will come from many different places. You will meet many different people who contributed to our collective learning. In the end, we want you to ask, "How did that knowledge get into the textbook?"

Image credits

Library of Alexandria in Egypt, illustration from *Illustrierte Geschichte* 1880.
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Galileo Explaining Moon Topography to Skeptics by Jean-Leon Huens
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