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APPROACHES TO KNOWLEDGE
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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.
I’m writing about knowledge here in a library, surrounded by books. A library is a good place to discuss knowledge because its purpose is to store knowledge. That’s why communities build them. Libraries are basically collections of collective learning. Collective learning is an idea that is very important in the Big History course.

In this library and others, knowledge exists in many forms: books, maps, films, videos, 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 high school and college 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?” How did people discover the facts or create the ideas that are in our textbooks?

Did you ever wonder how people create knowledge? Well, in this course you are going to meet many people who discovered or created the information that is in your textbooks. You will meet cosmologists, physicists, geologists, biologists, historians and more.

They are excited to tell you what they have learned. But they are also excited to tell you how they learned it. They are going to tell you how people in their field approach knowledge and the questions that interest them. They’ll also share with you how they used intuition, authority, logic, and evidence to support their claims.

In Big History we want you to pay attention to the questions these scientists and scholars 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 of the scholars you’ll meet in this course begin their investigations with questions. They are puzzled, curious, or even confused about the world around them.

Unlike textbooks that place questions at the end of learning, scholars ask the questions first. They use the questions to drive their learning forward.

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

Before investigating a question, scholars make a thoughtful guess about what they’ll learn. We often call these thoughtful guesses “conjectures” or “hypotheses.” But a question or a hypothesis isn’t knowledge yet. Scholars need to gather information to answer their questions. As you’ll learn in later units, sometimes people create or use new tools to help them gather new information. For example, Galileo made his own telescope to collect new data about the heavens and the planets.

Scholars turn information into evidence to support claims

Gathering information does not automatically answer scholars’ questions. The information must also be organized and analyzed. It must be evaluated to see if it answers the driving questions that were asked at the beginning.

Scholars may then make claims that answer their questions, and use the information as evidence to support their claims. The stronger the evidence, the better the support for the claim. A better-supported claim is more likely to enter a textbook, for others to learn about it.

A painting of Galileo explaining observations made with his telescope
Scholars must show how they answered their questions

Let’s review. In this essay, I wondered how knowledge gets in textbooks and, 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 conjecture — a thoughtful guess or hypothesis.
• Next, they gather information to answer the question, often using new tools.
• They then analyze 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 the scholars’ work is still not finished. They must also show how they learned this new information. Why do they have to show how they learned it? Isn’t simply telling what they learned enough? Why must they also explain how they conducted their investigation, how they analyzed their information, and how they supported their claims?

Scholars want to contribute to 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 simply trust their claims based only on intuition, logic, or authority.

Scholars also want others to improve their claims. This might mean using new tools or new methods to gather new evidence to support or challenge the claims. Or it might mean asking a different question entirely.

Different approaches to knowledge

All scholars ask important questions whether they are archaeologists, anthropologists, biologists, or other scientists. They all begin asking questions, but they ask different questions. They all have ways to gather data, but they often have different ways to gather data.

As you meet the instructors in this course, do more than just learn what they are teaching. Try to understand how they do their work, what questions they ask, and how they answer their questions. You might ask each of them:

• What are the big questions that have interested you and driven you to personally search for the answers?
• 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. One of the most exciting things about Big History is that we will use ideas that come from many different places. That is why you’re going to meet many different people who have contributed to our collective learning.

We want you to ask, “How did that knowledge get into the textbook?”