



Navigating Science:

Do Scientists Change Their Minds?

Engage with this episode of "Dr. B in 3" as we illuminate the path of the scientific process and the ongoing revelation of truth through evidence.



Watch the show!



<https://www.youtube.com/watch?v=I3L0pnljcoU>

Quick Questions

1. Have you ever looked for evidence to answer a question? When?
2. Have you ever changed or grown your understanding of something because of new evidence?
3. Do you know of any topics that scientists have developed a new understanding of in recent years?
4. Have you or anyone you know ever wondered why scientists seemed to change their mind on a specific topic?



Deep Dives

1. Think of one thing that you believed when you were a young child based on the evidence in front of you, but that you now know is wrong. Name at least one piece of new evidence that helped you to re-evaluate your understanding.
2. An important part of science is being open to new evidence that may challenge our understanding of different concepts. Astronomer Carl Sagan once said, "Extraordinary claims require extraordinary evidence." In other words, if you make a claim that goes against centuries of scientific research, you must have a large amount of very compelling evidence for that claim. What is a scientific concept you feel is very well understood and unlikely to change significantly? Why do you feel like it is unlikely to change? What is an example of "extraordinary evidence" that would be required to change our understanding?
3. Sometimes, organizations or individuals mistakenly provide incorrect, misleading, or unscientific information – this is called misinformation. Other times, however, they intentionally provide incorrect, misleading, or unscientific information because it is beneficial to them or advances their agenda – this is called disinformation. How can you tell the difference? Is it important to know the difference? Why or why not?
4. Imagine you were alive at a time when it was widely believed that the Earth was flat. You are very observant and, as explained in the video, you start to notice evidence that makes you suspect that the Earth is not flat at all. What would you do? Would you tell someone? What sorts of dangers might there have been for people sharing their evidence and new theories? What sorts of benefits might there have been? Would those be different for different people? Why?
5. Changing your understanding of something based on new evidence can feel really uncomfortable for some people. That discomfort can lead some to avoid seeking or accepting new or contradictory evidence. Where do you think this discomfort comes from? Have you or someone you know ever felt this way? Explain. What might you say to someone, including yourself, to help alleviate this discomfort?

Engaging in Science Discussions



Recommended Grade Level: Middle and High School

Objective: To engage in open-ended discussions about critical science topics. While leading these discussions, it is important to ensure that everyone is heard, and everyone is treating one another with respect. There is no “right answer” during these discussions, and it’s okay to respectfully disagree.

Additional Notes: We recommend having these discussions multiple times with the same group of participants. This provides the opportunity to explore different topics and improve one’s abilities to have successful conversations about STEM topics. Quick Questions are optional and are recommended to be used as warm-up questions.

Materials: TV or projector Paper and writing utensils

TIMELINE (30 – 40 MINUTES)

5 min	10 min	5 min	10 min	10 min <i>(optional)</i>
Intro + prompts	Watch segment	Think/write time	Share with partner	Small groups

Intro (5 min) Before starting, select one Deep Dive question. Tell the group you will be asking them a question that has no right or wrong answer. After they watch the clip, they will have time to think about and write their response. They will share their response with a partner or small group. Now share the question you selected.

If participants are new to these sorts of discussions, you may want to review the following concepts:

- When you are sharing your responses, provide reasoning and evidence. Reasoning is your own thinking behind your answer. Evidence is facts that support your answer, such as historical facts or scientific facts. You may also have experiences from your own life that support your answer.
- When listening to your classmates, ask questions. The purpose of questions is to better understand their thought process, not to challenge them. Some ways to frame questions are: “I didn’t understand X.” “Could you explain Y again?” “What do you mean by Z?”
- If someone asks you questions, provide clarification. Explain your reasoning and evidence. Remember that there are no right or wrong answers.

Watch the segment (10 minutes)

Think/write time (5 minutes): Participants write down their answers

Share with a partner (10 minutes): Pair up participants. Each person has 5 minutes to share their response and answer questions from their partner. Then switch so each partner gets a turn.

(Optional) Small groups (10 minutes): Put participants in groups of 4 for share-outs and conversations.

(Optional) Homework prompts: Expand your response into a report, picture, poem, essay, short story, song, or performance. Or, write your own discussion question for the group.