

Myth vs. science

Which of the following are true, which are myths (or urban legends), and which are controversial? How could you test these claims?

1. You only use 10% of your brain.
2. A person's intelligence can be accurately measured by an IQ test.
3. Subliminal messages can lead people to purchase products or alter their behavior.
4. Playing classical music to babies can boost their intelligence.
5. Human memory works like a video camera, and accurately records what we've experienced.
6. Hypnosis can help people recover forgotten memories.
7. People with amnesia forget all details of their past lives.
8. Dreams possess symbolic meaning.
9. Stomach ulcers are caused primarily by stress.
10. We are romantically attracted to those who are completely different from us - "opposites attract."
11. Full moons affect behavior. During a full moon, there is a higher incidence of people being admitted to hospitals, being admitted to psychiatric hospitals, giving birth, committing crimes, or such.
12. Pluto is no longer considered a planet.
13. There are many other universes besides our own, forming a multiverse of universes.
14. People have been abducted by aliens.
15. Dropping a small coin from a tall building could kill a person on the ground below.
16. Cracking / popping your knuckles can cause arthritis.
17. Antibiotics can kill viruses.
18. A theory is the same as a conjecture, guess, or hypothesis (e.g., the theory of evolution).
19. The four seasons are caused by the earth's distance from the sun.
20. Diamonds are produced from coal by intense heat and pressures in the earth.
21. The Large Hadron Collider in Cern, Switzerland could produce a black hole that would destroy the earth.
22. The 5 Second Rule: If you drop food on the ground, it's okay to pick up and eat within five seconds, before bacteria get on it.
23. People are either left-brained or right-brained. The left half does language, math, and logical thinking; the right half does art, music, visual skills, intuitive thinking, and creative thinking.

Theories, laws, hypotheses...

In science, what do the following mean? How do they differ from normal parlance (normal conversational meaning & usage)? Discuss some examples that are important to your field.

- theory
- law
- hypothesis
- model

How do we prove or confirm them? What are some famous theories or laws that have been disconfirmed?

What are the key components of the following theories? What are some other important theories for people in your field? What (for example) are some hypotheses that they lead to?

1. Theory of relativity
2. Theories in quantum physics, e.g., the standard model, string theory
3. Theories in cosmology, e.g., inflation theory
4. Theory of evolution

Talking about your major

Imagine how you would explain your major to someone who knows nothing about it. Think of how you would explain the following (focusing especially on your specialization).

1. What your field is about – the general field, and your subfield or area of specialization.
2. How is it different from the pure sciences? How is it related to the pure sciences?
3. Why it is important for society / the world? Why should the average person care about what you do?
4. What do people in the field want to find out or accomplish? What do they care about? What questions or problems do they focus on? What are their ultimate goals? (Also: Are there some things that they might not be interested in, though people in the general public might associate it with your field?)
5. Why do you personally want to study it – your motivation, your goals, and why you find it interesting? How did you develop an interest in your particular field?
6. What are the most basic theories and concepts that guide your field – things that anyone in the field needs to thoroughly understand?
7. What are the biggest discoveries or revolutions that have shaped your field and made it what it is today?
8. How do people in the field do research? Does research follow the traditional scientific method, or something similar? Why is research done in that way? How do people report them, and how do people make use of others' research? (Give some examples.)

How would you explain about your field to the following people, if they are not familiar with your field – particularly if their background is in a completely different area?

- Your parents, siblings, and relatives
- Your significant other (boyfriend/girlfriend, spouse)
- Your (future) children (when you explain to them what you do)

Part 2

How you and others in the field view themselves and their field constitutes what we call a worldview, or a paradigm.

Next, ask your seniors about their thoughts on the above questions. How do their responses differ from yours? Describe these responses here.