

- STUDY GUIDE -

STEVE TRASH SCIENCE - LIVE - AFTERSCHOOL - SHOW

GENERAL SHOW OBJECTIVES -

Objective #1 – Understand the difference between Magic and Science.

Objective #2 - Understand exactly what science is and why it has value.

Objective #3 - Understand the scientific method and its usefulness.

Objective #4 - Understand that everyone needs to be science-literate.

STUDENTS WILL LEARN -

Science and Magic Tricks look remarkably similar. But they are very different. In this show Steve focuses on making STEAM - SCIENCE TECHNOLOGY ENGINEERING ART & MATH - fun by illustrating the difference between science and magic. He actually has a passion for both! Students will understand the difference between them AND get to explore how the scientific method makes us better thinkers and problem solvers as well.

VOCABULARY -

Magic - creating the **illusion** that you can defy the laws of nature.

Science - the study of how the natural world works.

Natural Resource - Something that is found in nature and can be used by people. Earth's natural resources include light, air, water, plants, animals, soil, stone, minerals, and fossil fuels. People need some natural resources to live. They use others to make their lives better.

The Scientific Method - a process or method of research. A problem is identified, information about the problem is gathered, a hypothesis or question is formulated from the information, and the hypothesis is put to test with an experiment to prove or disprove its validity. That information is then shared.



Scientifically Literate - a person that is curious about the world around them, can ask insightful questions, is able to find credible information, and use that information to form opinions that are scientifically informed.

IDEAS FOR DISCUSSION -

Please review these concepts and vocabulary words with your students. They cover ideas that are directly and indirectly addressed in the **STEVE TRASH SCIENCE - LIVE - SHOW**.

- How can we use The Scientific Method in our daily lives to solve problems?
- Of all the planets in our solar system, which planets can support carbon-based lifeforms?
- How is recycling household waste similar to the way our environment recycles water, dirt, and air?
- What is a hypothesis?
- What are some of the differences between science and magic? How does magic APPEAR to violate natural laws?
- Why does good scientific work require both observation and experimentation?

TRUE - FALSE - 9 POST-SHOW DISCUSSION QUESTIONS -

1. TRUE or FALSE – Science is creating the illusion that you can defy the laws of nature.

FALSE. *Science is actually the study of how the natural world works. Science is a powerful way of discovering the secrets of the universe, and everyone can use it to understand how the world works...it's not just for scientists. Magic, on the other hand, is not science. Magic is creating the illusion that you can defy the laws of nature.*

2. TRUE or FALSE – Science is fake.

FALSE. *This is totally false. Science is not fake at all. Without science, we wouldn't have cell phones, Velcro, the internet, or even games like Fortnite and Minecraft. Science is very true and very valuable to humans. Science is real and makes our lives better. Scientists (and you and I) can use verifiable steps, starting with a hypothesis and going to a conclusion to prove or disprove a theory. Science helps us better understand nature and the world around us.*

3. TRUE or FALSE – Sodium Polyacrylate is a polymer used in baby diapers.

TRUE. *Sodium Polyacrylate is non-toxic, biodegradable, polymer that's used to absorb very large amounts of liquid. That property is why it's used in diapers. Remember how Steve pretended to pour water into a cup and make it disappear? It didn't really disappear — he just pretended that it did. It was actually absorbed by sodium*

polyacrylate, transforming it into a gel that wouldn't fall out of the cup. Magic is cool, but science is just as cool. Magic is for fun, but science is for real.

4. TRUE or FALSE – Magic is for FUN, but Science is for REAL.

***TRUE.** Magic is creating the illusion that you can defy the laws of nature. No one can defy the laws of nature. Science is about discovering the laws of nature and how they work and understanding them better. Scientists, and you and I, can do this through experimentation and using the scientific method.*

5. TRUE or FALSE – This is the Scientific Method: Step 1 is to just make something up. Step 2 is to pretend that it's true because I want it to be true. Step 3 is to tell others that they are stupid and call them names because they don't believe in my version of science.

***FALSE.** The Scientific Method is about having an idea and supporting that idea with evidence that others can see, understand, and verify. There are different versions of the Scientific Method. Here's one of them with an example.*

STEP 1. Make an observation. For example, pretend Steve's computer won't start.

STEP 2. Ask a question. "I wonder why Steve's computer won't start?"

STEP 3. Create a hypothesis or an educated guess as to why this happened. "I think it won't start because the power strip is off."

STEP 4. Create an experiment to determine whether your guess is accurate or not. "I'm going to plug Steve's computer into a power strip that I know is turned on."

STEP 5. Draw a conclusion. "Steve's computer started when it was plugged it into a power strip that was turned on, so his power strip must have been turned off."

STEP 6. Determine whether the outcome supports your hypothesis or not. "It does!"

6. TRUE or FALSE – Science is just something that smart people use to make everyone else feel stupid.

***FALSE.** Science is for everyone. Science is a way of looking at the world and using verifiable fact-based questions about the natural world. Science is a better way to understand the physical world. Everyone can use science, and this includes you and me.*

7. TRUE or FALSE – Cell phones, YouTube, and [Minecraft](#) could not exist without science.

***TRUE.** The technology that makes these wonderful things possible was brought to us by engineers, scientists, programmers, and game creators. They all used science and the scientific method to make these wonders possible.*

8. TRUE or FALSE – The Scientific Method is a series of steps that includes making an observation, asking a question, creating a hypothesis (educated guess), designing an experiment, coming to a conclusion, and determining if your results do or do not support your hypothesis.

***TRUE.** There are different versions of the scientific method, but they are all a way of gaining knowledge through a step by step process that bases its conclusions on experiments and evidence. The steps are observe, question, hypothesize, experiment, make a conclusion, and examine your results.*

9. TRUE or FALSE – The magician is seeking to entertain, **and** the scientist is working – using the scientific method – to discover and share how the natural world works.

TRUE - A magician uses the holes in our perception (the assumptions we make and the way we see things) to create false impressions. They pretend to defy the laws of nature. The scientist works to use all the facts regarding questions (without ignoring facts that contradict their hypothesis) to draw an accurate conclusion.

MORE TEACHER RESOURCES -

Steve Trash has lots of cool resources that teachers (grades 1-5) can use in the classroom on his website. www.stevetrash.com

STEVE TRASH - PBS TV STAR + ROCKIN' ECO HERO

Steve Trash is the star of his own nationwide - PBS kids science show - **STEVE TRASH SCIENCE**. Want to watch? Go to official PBS site. <https://www.pbs.org/show/steve-trash-science/> and check it out or check your local PBS listings.

He was recently honored with the **EAEA'S - BEST ENVIRONMENTAL EDUCATION PROGRAM OF THE YEAR AWARD** and has also won the **OUTSTANDING RC&D PROGRAM** award and **BEST ENVIRONMENTAL SCIENCE CURRICULUM**.

He's appeared on many national and international **TV** shows including - **CBS THIS MORNING, ESPN OUTDOORS, VH1 TOP 20 COUNTDOWN** and was recently interviewed on Levar Burton's **READING RAINBOW**.

He's been featured in the **NEW YORK TIMES, the LOS ANGELES TIMES, FAST COMPANY MAGAZINE**, and he's even been on the cover of the kids' magazine, **THE WEEKLY READER**.

Always attempting to "walk the talk", Steve lives in an energy-efficient, earth-bermed home with a 21-panel solar PV array, in beautiful downtown Frog Pond, Alabama. Here's a link to a story about our home.

<https://www.stevetrash.com/bio>

PBS – STEVE TRASH SCIENCE - <https://www.pbs.org/show/steve-trash-science/>

Steve Trash - Rockin' Eco Hero www.stevetrash.com 5192024