The Science of Magic - Learn to Differentiate Science from Pseudoscience with Zack Frederick

What is pseudoscience? A belief in a process or product that uses science to grant legitimacy

* You are often told to find the study that is best for you
* Pseudoscience does not self-correct
* Pseudoscience interprets any event the past differently to maintain confirmation of your theory. You can therefore use any justification to confirm anything you desire.

Science is defined by some: “Our way of describing, as best one can, how something works”

1. Guess how something works
2. Compute the consequences of the guess (if guess correct, what will you learn. If not, what other guesses can explain what you are looking at?)
3. Compare guess to experiment
	1. If guess disagrees with experiment – guess is wrong
	2. If guess agrees with experiment – failed to disprove guess
4. If repeated tests fail to disprove – guess generally accepted

Consider if your guess fits context of what others are guessing

**How can you contrast Science and Pseudoscience?**

 **Science often features two key parts:**

1. **Past data predicts future state of affairs**
2. **Data used to try to disconfirm your guess**

**Pseudoscience often features two key parts:**

1. **Past data predicts present state of affairs**
2. **Data used to confirm your guess**

Critical thinking (how you can spot Pseudoscience)

* Always ask for a detailed explanation of the science. Whoever is presenting it should be able to explain it on a level you can understand if they truly grasp what they are showing.
	+ You should always be able to weigh the results against the interpretation.
	+ Don’t assume interpretation is always correct, regardless of who made the interpretation
* Always look for dispersion around means in graphs and tables. Lots of dispersion is a bad thing, inconclusive
* Listen to the presenter’s logic and determine how they are constructing their argument. Which part of the bolded section (**How can you contrast Science and Pseudoscience?**) are they following?



Zachary Frederick’s research agronomist position is funded through the Manitoba Agriculture’s CAP program and the MHPEC partners: KPPA, McCain and Simplot. Citations and sources for this presentation, as well as further applied potato research, can be found at mbpotatoresearch.ca