

the
Teachers' Guide
to
Cranky Uncle

I PREFER
OLD SCHOOL!



JOHN COOK

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The Cranky Uncle game was developed by [Autonomy Co-op](https://autonomyco-op.com/).

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Introduction to Cranky Uncle

The **Cranky Uncle game** builds resilience against misinformation and strengthens players' critical thinking. It achieves this through inoculation—explaining the rhetorical techniques used to mislead. The denial techniques in the game are built on the five techniques of science denial outlined in the **FLICC framework**.



TECHNIQUE	DEFINITION
Fake Experts	Presenting an unqualified person or institution as a source of credible information.
Logical Fallacies	Arguments where the conclusion doesn't logically follow from the premises. Also known as a non sequitur.
Impossible Expectations	Demanding unrealistic standards of certainty before acting on the science.
Cherry Picking	Carefully selecting data that appear to confirm one position while ignoring other data that contradicts that position.
Conspiracy Theory	Proposing that a secret plan exists to implement a nefarious scheme such as hiding a truth.

The game features explanations and quizzes. First, Cranky Uncle explains denial techniques, then players practise spotting these denial techniques in quizzes. As players get further into the game, they build up cranky points and their mood gets crankier. More importantly, the more they play, the more resilience they develop against misinformation.



Why we can't ignore misinformation

Misinformation damages in a number of ways. It causes people to believe wrong things. It polarizes the public. It reduces trust in important institutions like scientific organizations.

One of the most insidious and dangerous aspects of misinformation is it can cancel out accurate information. When people are presented with fact and myth but don't know how to resolve the conflict between the two, the risk is they disengage and believe neither.



By reducing trust or belief in facts, misinformation achieves its goal. This means merely teaching the facts is not enough as facts can be cancelled out by misinformation. We need to protect our facts as we send them out into the world.

The solution to misinformation is to help people resolve the conflict between fact and myth. We achieve this by explaining the techniques used to mislead. In other words, inoculate the public against the misleading rhetorical techniques of misinformation. Then when presented with fact and myth, they can resolve the conflict by identifying the rhetorical technique the myth uses to distort the facts.



A game that teaches you to outsmart boomers.

Student



A vaccine against misinformation

The Cranky Uncle game is informed by [inoculation theory](#), a branch of psychological research that applies the concept of vaccination to knowledge. Just as exposing people to a weakened form of a virus builds immunity to the real virus, similarly, exposing people to a weakened form of misinformation builds immunity to the actual misinformation.

How do you deliver misinformation in weakened form? There are two elements to an inoculating message. First, warn of the threat of being misinformed. Second, explain how the misinformation is wrong. Two inoculation techniques are:

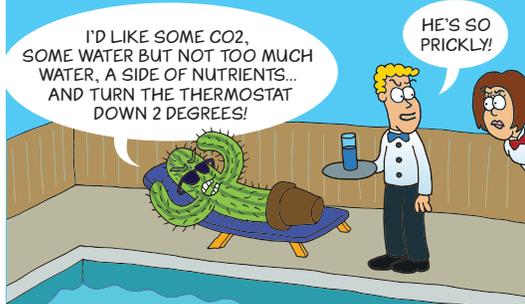
Fact-based inoculations show how the misinformation is wrong by explaining the facts. While it's always an educators' goal to explain facts and increase students' science literacy, this approach has limitations: a fact-based inoculation typically only works against a single myth.

Logic-based inoculations explain the rhetorical techniques or logical fallacies used to mislead. The advantage of this approach is it works across topics. Inoculating against a misleading technique in one topic builds resilience against the same technique in other topics. The Cranky Uncle game applies logic-based inoculation.

FACT-BASED INOCULATION

Debunking the myth "CO₂ is plant food"

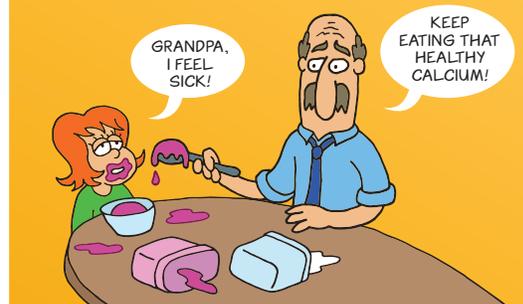
Climate change caused by CO₂ results in heat waves and increased flooding. While plants do use CO₂ to grow, CO₂ emissions ultimately harm plant growth. Plants are fussy—they need a comfortable temperature range and the right amount of water to flourish.



LOGIC-BASED INOCULATION

Debunking the myth "CO₂ is plant food"

Climate change caused by CO₂ disrupts the environment, with heat stress and increased flooding harming plant growth. This myth is an oversimplification—it's like saying humans need calcium so all we need to eat is ice cream.



“

Humor made it enjoyable to learn. It's crazy that people think like this.

Student

”



Critical thinking: a universal vaccine

Logic-based inoculation has been shown to counter misinformation across topics. In [one experiment](#), when participants were inoculated against a rhetorical technique used by the tobacco industry, they were no longer misled by the same technique used in climate misinformation.

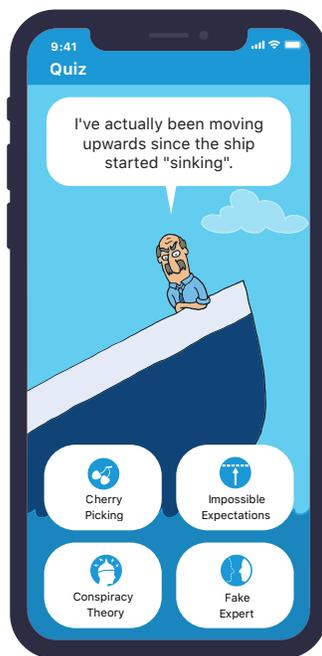


Fake experts technique by tobacco industry.



Fake experts technique by climate deniers.

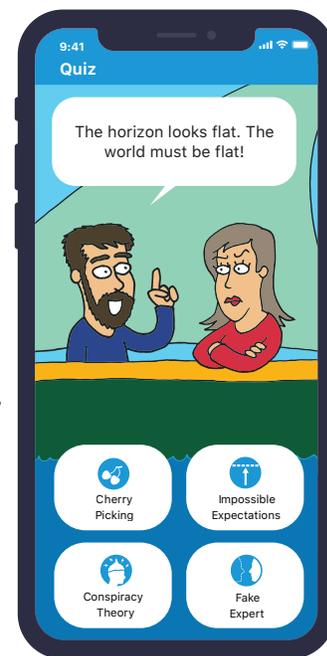
This means that logic-based inoculation are effective across topics. As science denial techniques are used in many areas of science, it's possible to inoculate against misinformation across different topics with a single inoculation. Researchers call this the "umbrella of protection" although to avoid mixing metaphors, it might be more fitting to say that logic-based inoculation is like a universal vaccine against misinformation.



Fallacies can appear in many contexts and across different topics.

General situations can be used to illustrate the silliness of a fallacy

They can also be applied to specific topics such as flat-Earthism

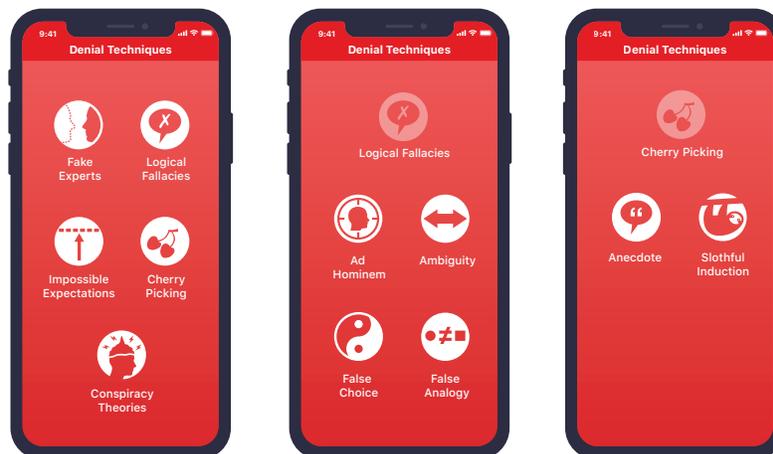


Giving misinformation the FLICC

In 2007, [Mark Hoofnagle suggested](#) that science denialists all employed the same five rhetorical tactics to sow confusion: fake experts, logical fallacies, impossible expectations, cherry picking, and conspiracy theories. Since then, I have continued to develop this framework into a more detailed taxonomy, summarizing the five denial techniques with the acronym FLICC. Familiarity with denial techniques is key to logic-based inoculation—learning each rhetorical technique equips people to spot these misleading tactics in misinformation. The following simplified version of the [FLICC taxonomy](#) is the one used in the Cranky Uncle game:



The purpose of the [Cranky Uncle game](#) is to familiarize players with the denial techniques in the [FLICC taxonomy](#). The game begins with players able to access the first five techniques: fake experts, logical fallacies, impossible expectations, cherry picking, and conspiracy theories. Once they have completed all five explanations, they unlock higher levels: the two types of cherry picking and seven types of logical fallacies (with seven conspiratorial traits to be added).



Gamification and active inoculation

A fundamental challenge in building resilience against misinformation is that critical thinking is hard! This is because most thinking is effortless, fast thinking (e.g., mental shortcuts or heuristics) rather than effortful, slow thinking (e.g., critically assessing the logical validity of misinformation). However, there is a third type of thinking—expert heuristics. The more experienced or practiced we get at a difficult task, the quicker and easier it gets. This is why experienced surgeons can survey a complex situation in an instant and make snap decisions.

Games incentivize players to complete tasks over and over. With the [Cranky Uncle game](#), the task is critical thinking—the difficult job of assessing arguments to identify reasoning fallacies. Through repetitive practice, players turn a difficult, slow thinking task into an expert heuristic. The best way to fight a bad heuristic is with a good heuristic.



“ One student summed it up perfectly when she said that it’s “helpful to know when you’re being lied to.” And that’s the point... Learning how not to be fooled is empowering.

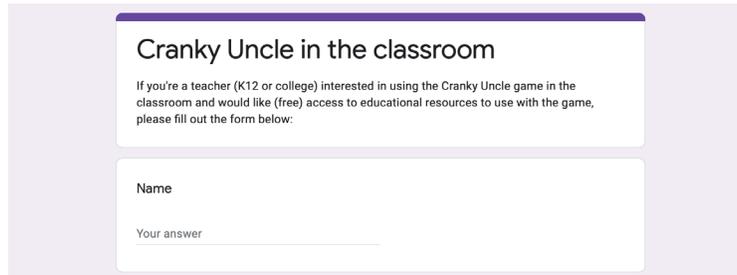
Melanie Trecek-King, Massasoit Community College



Getting set up for the classroom

Step 1: Register for group code

Visit the [Class Registration Form](#) to sign up. Providing details about your classes will help us provide the group codes needed for your students to access the game.

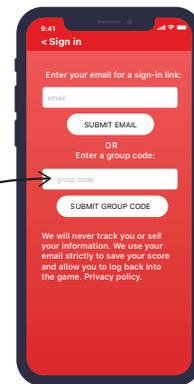


Step 2: Download the game

Students can access the game in three ways:

- iPhone: <https://sks.to/crankyiphone>
- Android: <https://sks.to/crankyandroid>
- Browser: <https://app.crankyuncle.info>

Students enter group code here for instant access to game



Step 3: Distribute group code

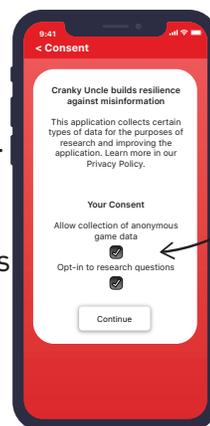
Once you receive the group code/s by email, you can give the code to students. Once they enter the group code into the game, they will have instant access to the game. Students don't have to enter any identifying details to access the game.

Step 4: Research

We're conducting research to assess the effectiveness of the game in increasing critical thinking. To participate, players need to consent at the start of the game in two steps, shown here. For students under 18 years, an [Information Sheet](#) is provided for parents.

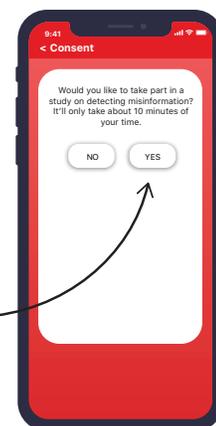
They will fill out a 10-question research quiz at the start of the game then another 10-question quiz after they've completed all denial techniques.

Participation is voluntary and completely anonymous—no identifying details are collected. Students can opt-out of the research at any time by changing their consent via the About screen in the game.



To participate in research, players check both boxes...

...and select YES



How the game works

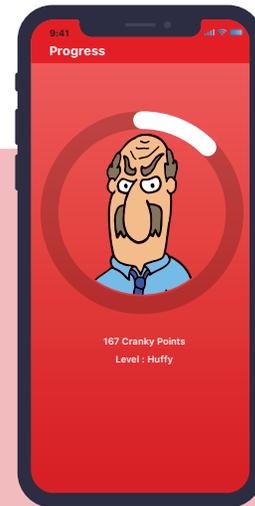
Players can play the game to different levels of completion. Ideally, players should complete the explanations of all the denial techniques – on the Denial screen, each technique features a tick once it's completed.

Players can also practise spotting fallacies in quiz questions. They get the option to do quizzes at the end of each denial technique explanation. They can also choose to "Take a Quiz!" from the home screen.

As they complete explanations and quiz questions, players collect "cranky points" and each time they progress to a new level, their mood gets crankier.

EXTRA CREDIT IDEA

For my class (CLIM759 at George Mason University), students could earn up to 5% of their assessment by playing the game. For each 100 cranky points, they earned 1% of their assessment. Students submitted proof of gameplay by emailing or uploading a screenshot of the game's progress screen. (FYI, every student scored just over 500 points to get the full 5%)



Completing all the denial techniques takes around 30 minutes. Players can take longer depending on how many quiz questions they answer.

Age restrictions

The game is written for ages 10 and up. There is no profanity or violent language. To date, the game has been played in classes from grade 6 to grad school at university.

“ I used the app in a teaching session for intensive care trainees and it was well received. We did it via zoom as usual and I shared the screen of the app from an iPad but also used a laptop and polling to get the top voted answer. Linking it to the debunkings and fallacies in your COVID Vaccine Communication Handbook is seamless. The fact that the app includes vaccine denial makes it a no-brainer for training health professionals to make sense of anti-vaccine misinformation.

Dr Mark John Hayden, Great Ormond Street Hospital



Teacher concerns/questions

I'm worried about offending students

Presenting a topic associated with a particular ideology, such as political affiliation, may offend a student and cause them to reject any facts or evidence presented. How do we avoid this? Luckily, early adopters of the [Cranky Uncle game](#) in the classroom have found success by first developing trust within the classroom. Explaining that we're all vulnerable to being misled and every one of us has fallen victim to misinformation sets up a foundation of unity among the students, regardless of ideology. It helps if students have already developed a sense of trust and belonging as a member of the class. It's also important to distinguish between creators of disinformation and those who fall for and perpetuate the misinformation. Show students that the purpose of the activity is to empower them against misinformation. To give them a tool that they can use to avoid being fooled in the future.

I don't feel confident in my own background knowledge

The focus of the [Cranky Uncle game](#) is critical thinking—it takes a logic-based approach so it is more important to establish a grounding in the basics of argumentation. Here are some recommended resources:

- [How to spot and tag misinformation](#): 14-minute video walking through the deconstruction method (with excerpts of the [Critical Thinking Cafe](#) video).
- [How to debunk misinformation](#): 10-minute video on the psychology of debunking, explaining the fact-myth-fallacy structure.
- [Deconstructing climate misinformation to identify reasoning errors](#): a scholarly paper outlining a step-by-step approach to deconstructing and analysing misinformation. It features examples of dozens of climate myths in the supplementary material.
- And of course, it's highly recommended you play the whole [Cranky Uncle game](#)! Answering as many quizzes as possible builds familiarity with fallacies.

How do I learn more about denialist techniques?

- [23 ways to mislead](#): 41-minute video going into detail on different fallacies in the FLICC taxonomy with many climate examples.
- [History of FLICC](#): blog post introducing the entire FLICC taxonomy including definitions and examples. This post is a living document, regularly updated as the FLICC taxonomy expands to include more fallacies.



Classroom activities

The following are a range of suggested classroom activities to accompany playing of the [Cranky Uncle game](#) (either in or out of class).

ACTIVITY 1: Introduction to FLICC

Introduce the techniques of denial in the FLICC taxonomy. The [FLICC Powerpoint](#) features definitions of the denial techniques featured in the game as well as cartoon examples of each fallacy. An interactive exercise can show cartoon examples with the class discussing each example before the “answer” is given. If students struggle to remember the names of the fallacies, discussion allows students the chance to first explain why the example is fallacious.

Resources

- [History of FLICC](#): The full FLICC taxonomy with definitions and text examples.
- [FLICC Powerpoint](#): Slideshow featuring definitions and cartoon examples.
- [Climate myth examples](#): Google sheet of examples of climate myth fallacies, including quote text and link to video excerpt.

ACTIVITY 2: Walk-through game

One approach appropriate for younger classes—particularly with online classes—is to have a student or the teacher play the game while sharing their screen. The teacher can stop regularly through the game and facilitate group discussion. For example, stop at a quiz question and have students discuss which answer they prefer and why.

“ It was a pretty informal online class. One student had the game on her iPad. She screen-shared and read the questions. Then the group talked about the answers and voted. There were only five of us so it didn’t need to be too structured. For bigger groups, it’d be cool to use a poll feature (either through zoom or through Socrative) so that everyone could vote anonymously, but then see how others voted.

Park Guthrie, Schools for Climate Action

”



Classroom activities

ACTIVITY 3: Roleplaying

This is an “active inoculation” exercise where students break up into small groups and one student plays a cranky uncle and another student/s try to convince the uncle of the reality of human-caused global warming. The cranky uncle uses fallacies from the game and the others try to identify the fallacies and respond.

Resources

- [Drunk Critical Thinking](#): Blog post about cranky uncle roleplaying, featuring a 2:41 minute video of John Cook roleplaying cranky uncle with climate scientist Natalie Burls (warning: drinking not recommended in the classroom!)

DEFINITIONS

Active inoculation: A more interactive form of inoculation where recipients develop resistance to misleading techniques by actively generating the techniques themselves (e.g., by role playing being a misinformer).

ACTIVITY 4: Create misinformation

This is another “active inoculation” exercise where students write a short article arguing a specific point using at least several fallacies from the Cranky Uncle game. The article can take the form of spoken speech, op-ed, advertisement, meme, etc. Other students can respond by attempting to identify fallacies in each assignment.

Example: Why I shouldn't fail this class

By Melanie Trecek-King, Massasoit Community College

Assignment for students:

1. Imagine you're failing this class because you didn't do the vast majority of the work, such as watching lectures or completing assignments. Write an email to your professor arguing why you should pass the course, using at least four fallacies from the Cranky Uncle game.
2. Read your classmates posts carefully and reply to at least two of your classmates. Identify and name the fallacies the other student used in their argument, and explain why it's fallacious.



Classroom activities

ACTIVITY 5: Create new questions

Students write quiz questions for the Cranky Uncle game by finding real-world examples of the fallacies from the game, or creating parallel arguments from existing misinformation. This activity encourages students to apply what they've learned to help inoculate others. Students will likely recognize that fallacious reasoning is (unfortunately) ubiquitous.

Potential applications

- Use Padlet for compiling questions. Have students search social media and/or media/articles for examples of logical fallacies. Students collectively post their suggested questions to Padlet. Can post as website/video link, meme, or text.
- Students' fallacy examples can be presented in the form of multiple choice questions and shown back to students as an interactive exercise.

ACTIVITY 6: Apply FLICC to other types of denial

Students test the FLICC framework by evaluating claims across different topics such as evolution, GMOs, vaccines, etc. The purpose of this exercise is to reinforce that FLICC denial techniques can be found in misinformation across any topic.

Potential applications

- Instruct students to go through their social media accounts, looking for misinformation and identifying possible fallacies.

ACTIVITY 7: Debunking misinformation

Watch [How to debunk misinformation](#) to learn how to structure a debunking. Then have them play the [Cranky Uncle game](#) to build familiarity with denialist techniques. Then assign examples of misinformation for them to write a debunking according to communication guidelines (e.g., fact-myth-fallacy structure). Debunking can be submitted in written/infographic form or as an oral presentation.

Resources

- [How to debunk misinformation](#): 10-minute video outlining best-practices for debunking misinformation.
- [Debunking Handbook 2020](#): A concise and practical summary of research into effective debunking.
- [CLIM759 Syllabus](#) includes a rubric for grading rebuttals according to structure, sticky science, inoculation, and convinceness (see Appendix 4).



Classroom activities

ACTIVITY 8: Deconstructing misinformation

This activity is fairly advanced (both for students and the instructor). However, the benefit is equipping the students with tools to be able to identify fallacies in misinformation as well as an appreciation for the difficulties of critical thinking.

This activity is divided into three stages: explanation of the deconstruction method, an activity where students deconstruct examples of misinformation, and a reflection section where students report back on what they learnt from their deconstruction exercise.

1. Explaining the deconstruction method

This activity is based on the paper [Deconstructing climate misinformation to identify reasoning errors](#). See Appendix 3 for a brief introduction. Students should be encouraged to read or view background material (see below).

2. Deconstruction activity

Explain to the class that you're going to divide the class into small groups, and have each group deconstruct an example of misinformation. In a small group, the entire class can deconstruct the myth together.

3. Reflecting on deconstruction exercise

Reassemble the students and have each group report back to the class on how they deconstructed their myth as well as which denial techniques they identified, as well as any difficulties they encountered in the task.

Suggested background material

- [Critical Thinking Cafe](#): basic, light-hearted 3-minute video introduction to the deconstruction method—appropriate for middle school.
- [How to spot and tag misinformation](#): intermediate, 14-minute video with a more detailed treatment of the deconstruction method—appropriate for high school.
- [Deconstructing climate misinformation to identify reasoning errors](#): advanced scholarly paper explaining the full deconstruction method—appropriate for university.



Appendix 1: FLICC definitions

TECHNIQUE	DEFINITION	EXAMPLE
Ad Hominem	Attacking a person/group instead of addressing their arguments.	"Climate science can't be trusted because climate scientists are biased."
Ambiguity	Using ambiguous language in order to lead to a misleading conclusion.	"Thermometer readings have uncertainty which means we don't know whether global warming is happening."
Anecdote	Using personal experience or isolated examples instead of sound arguments or compelling evidence.	"The weather is cold today – what happened to global warming?"
Cherry Picking	Carefully selecting data that appear to confirm one position while ignoring other data that contradicts that position.	"Global warming stopped in 1998."
Conspiracy Theory	Proposing that a secret plan exists to implement a nefarious scheme such as hiding a truth.	"The climategate emails prove that climate scientists have engaged in a conspiracy to deceive the public."
Fake Experts	Presenting an unqualified person or institution as a source of credible information.	"A retired physicist argues against the climate consensus, claiming the current weather change is just a natural occurrence."
False Analogy	Assuming that because two things are alike in some ways, they are alike in some other respect.	"Climate skeptics are like Galileo who overturned the scientific consensus about geocentrism."
False Choice	Presenting two options as the only possibilities, when other possibilities exist.	"CO ₂ lags temperature in the ice core record, proving that temperature drives CO ₂ , not the other way around."
Impossible Expectations	Demanding unrealistic standards of certainty before acting on the science.	"Scientists can't even predict the weather next week. How can they predict the climate in 100 years?"
Logical Fallacies	Arguments where the conclusion doesn't logically follow from the premises. Also known as a non sequitur.	"Climate has changed naturally in the past so what's happening now must be natural."



Appendix 1: FLICC definitions

TECHNIQUE	DEFINITION	EXAMPLE
Red Herring	Deliberately diverting attention to an irrelevant point to distract from a more important point.	"CO ₂ is a trace gas so it's warming effect is minimal."
Single Cause	Assuming a single cause or reason when there might be multiple causes or reasons.	"Climate has changed naturally in the past so what's happening now must be natural."
Slothful Induction	Ignoring relevant evidence when coming to a conclusion.	"There is no empirical evidence that humans are causing global warming."
Straw Man	Misrepresenting or exaggerating an opponent's position to make it easier to attack.	"In the 1970s, climate scientists were predicting an ice age."

More resources on FLICC and denial techniques:

- [23 ways to mislead](#): 41-minute video going into detail on different fallacies in the FLICC taxonomy with many climate examples.
- [History of FLICC](#): blog post introducing the entire FLICC taxonomy including definitions and examples. This post is a living document, regularly updated as the FLICC taxonomy expands to include more fallacies.
- [Deconstructing Climate Science Denial](#): scholarly book chapter outlining the full FLICC taxonomy (a scholarly version of the [History of FLICC](#) blog post).



Appendix 2: Debunking climate myths

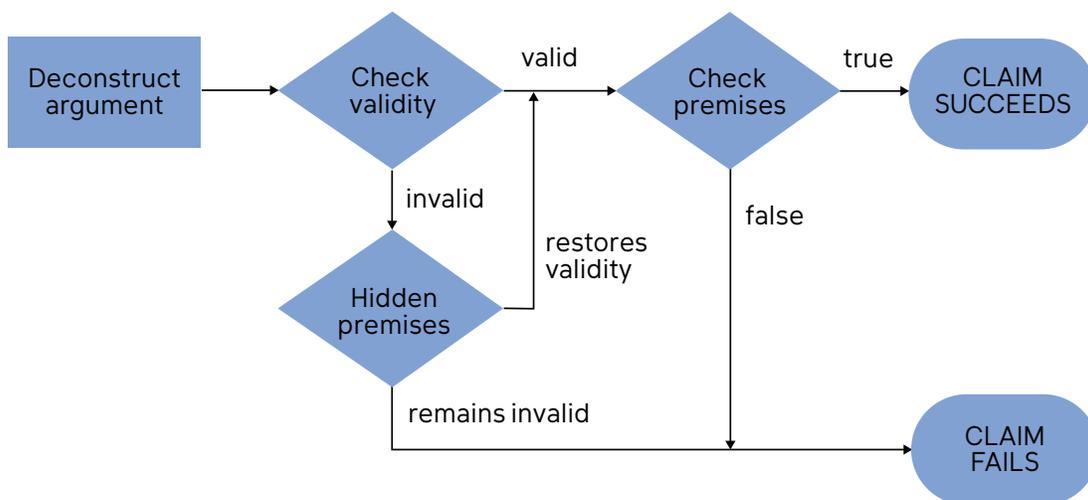
FACT	MYTH	FALLACY
Global warming is like rigging the weather dice, making it more likely to get hot days.	"It's cold outside, so global warming must have stopped."	Impossible Expectations: Global warming doesn't mean no more cold weather, just fewer cold days compared to hot days.
For thousands of years, our atmosphere has been in balance. Humans have upset the balance.	"Human CO ₂ emissions are tiny compared to natural CO ₂ emissions so our influence is negligible."	Over-simplification: Considers only natural CO ₂ emissions and ignores natural CO ₂ sinks.
Emitting more CO ₂ means more heat is being trapped high up in the atmosphere where the air is thinner.	"The greenhouse effect is saturated so adding more CO ₂ won't affect it."	Over-simplification: Considers atmosphere as a single layer when it's multiple layers.
Ice cores tell us warming causes the ocean to emit more CO ₂ . Combined with greenhouse effect, this is a reinforcing feedback.	"CO ₂ lagging temperature means greenhouse effect is minimal."	False dichotomy: It's not one or the other but both. CO ₂ causes warming and warming causes CO ₂ to rise.
Satellites measure the warming effect from CO ₂ . The increased greenhouse effect is an observed reality.	"CO ₂ is a trace gas so its warming effect is minimal."	Red herring: Trace amounts of substances can have a strong effect and this is irrelevant to the warming potential of CO ₂ .
Changing patterns in the yearly and daily cycle confirm human-caused global warming, rule out the sun.	"The sun is causing global warming."	Cherry picking: Ignores human fingerprints and recent period where sun and climate move in opposite directions.
Past climate change tells us climate is sensitive to the warming effect of CO ₂ .	"Natural climate change in the past implies current climate change is also natural."	Single cause: Just because nature caused climate change before doesn't necessarily mean it's the cause now.
Models have made a number of successful predictions based on fundamental physical principles.	"Models predictions have failed, making them unreliable."	Impossible Expectations: Climate models have had great success at predicting long-term effects like greenhouse warming.
Climate models simulate climate which is weather averaged over time.	"Scientists can't even predict weather."	Red herring: Confuses weather with climate. Short-term predictions are irrelevant to long-term climate predictions.



Appendix 3: Deconstructing claims

You can identify fallacies in misinformation via the following 3-step process:

1. **Deconstruct claim.** All claims can be deconstructed to an argument structure, involving premises (starting assumptions) and a conclusion.
2. **Assess logical validity.** Once an argument structure is established, the argument can be checked for logical validity. If the premises are all true, does it follow that the conclusion must be true also.
 - 2a. **Identify hidden premises.** If the argument is logically invalid, that usually means there is a hidden, unstated assumption. Add the hidden premise that makes the argument logically valid.
3. **Assess premises.** Once the argument is logically valid, scrutinize the premises to see if they're all true. This typically is when reasoning fallacies are identified.



Here is an example of the deconstruction method on a common climate myth:

MYTH "The reason why the climate is changing now is climate has always been changing."

P1 Climate has changed naturally in the past.

P2 The climate is currently changing.

P3 Past drivers of climate change must be the same as current drivers of climate change.

CONCLUSION

Current climate change is naturally-caused.



SINGLE CAUSE FALLACY

Assumes that only one factor drives climate change (natural causes) when other factors (human activity) can also drive climate change.



Appendix 4: Rubric for debunking

The following rubric was originally conceived for the [Denial101x MOOC](#) then further developed for the [CLIM749/COMM640 grad class](#) at George Mason University. It is a useful framework for assessing debunking structure and content. It can be used with Activity 7.

Resources

- [How to debunk misinformation](#): 10-minute video delving into the psychology of debunking and explaining the fact-myth-fallacy structure.
- [Six ways to make your science sticky](#): 35-minute video outlining six traits of sticky science with many examples and communication case studies.
- [23 ways to mislead](#): 41-minute video explaining 23 denial techniques found in climate misinformation, with examples. Complements [Cranky Uncle game](#).

1. Structure

How well does the rebuttal follow the Fact-Myth-Fallacy structure. Does the rebuttal clearly mention the fact first, address the myth (while giving a warning cue before the myth) and finally explain the fallacy by which the myth distorts the science.

- **Excellent:** Clearly followed the Fact-Myth-Fallacy structure throughout the assignment with logical and effective transitions between elements.
- **Good:** Adequately followed the Fact-Myth-Fallacy structure.
- **Needs Improvement:** Hasn't followed the Fact-Myth-Fallacy structure consistently.

2. Sticky Science

How well does the rebuttal provide a factual replacement to the myth in a sticky and fallacy-free manner. Does it include facts and evidence to support the points made throughout the writing. Look for simple, credible and concrete explanations.

- **Excellent:** includes a factual replacement to the myth. The fact is sticky (contains one or more of the following: Simple, Unexpected, Credible, Concrete, Emotional, Stories) and does not contain fallacies.
- **Good:** Includes a factual replacement to the myth. The fact may be missing the qualities of stickiness (Simple, Unexpected, Credible, Concrete, Emotional, Stories) but is fallacy-free.
- **Needs Improvement:** Doesn't include a factual replacement or the factual replacement is missing the qualities of stickiness and may include a fallacy.



Appendix 4: Rubric for debunking

3. Inoculation

How well does the rebuttal provide a factual alternative to the myth in a sticky and fallacy-free manner. Does it include facts and evidence to support the points made throughout the writing. Look for simple, credible and concrete explanations.

- **Excellent:** Correctly identified why the myth is incorrect and clearly explained the fallacy (e.g., used analogy/parallel argument to reinforce explanation).
- **Good:** Correctly identified why the myth is incorrect and adequately explained the fallacy.
- **Needs Improvement:** Incorrectly identified why the myth is incorrect or not sufficiently explained the fallacy.

4. Convincing argument

Is the rebuttal convincing? Do all of the elements worked together to develop a cohesive and complete response.

- **Excellent:** Is convincing and fallacy-free, containing a clearly written and complete argument.
- **Good:** Is convincing and fallacy-free.
- **Needs Improvement:** Somewhat convincing or containing fallacies.

