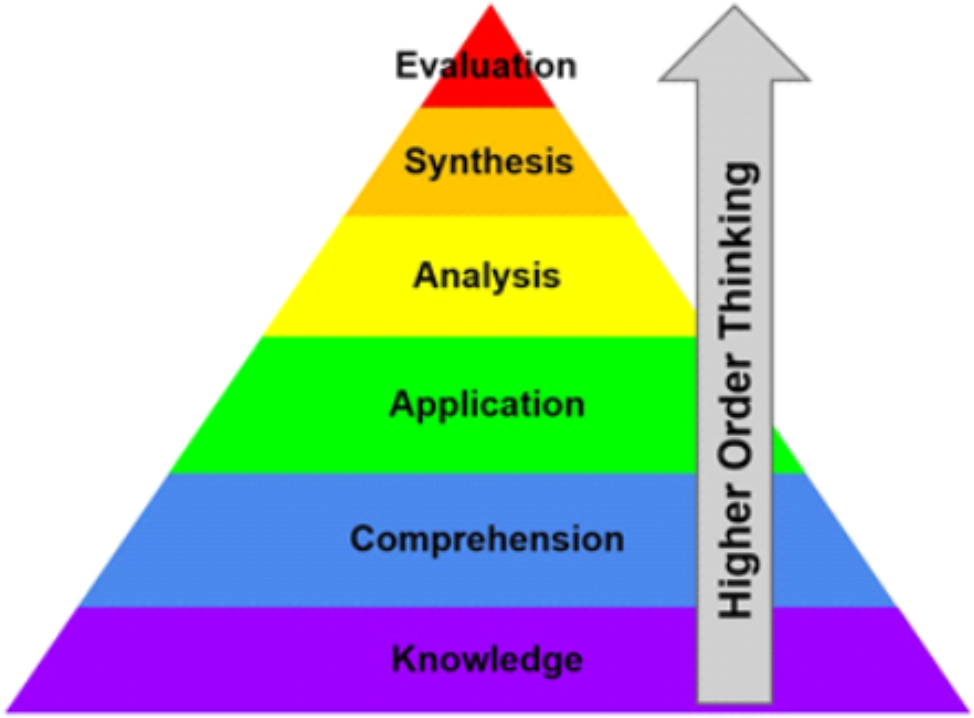
Critical Thinking

"The careful, deliberate determination of whether one should accept, reject, or suspend judgment about a claim and the degree of confidence with which one accepts or rejects it."

(*Critical Thinking*. B. Moore and R. Parker, 2007)



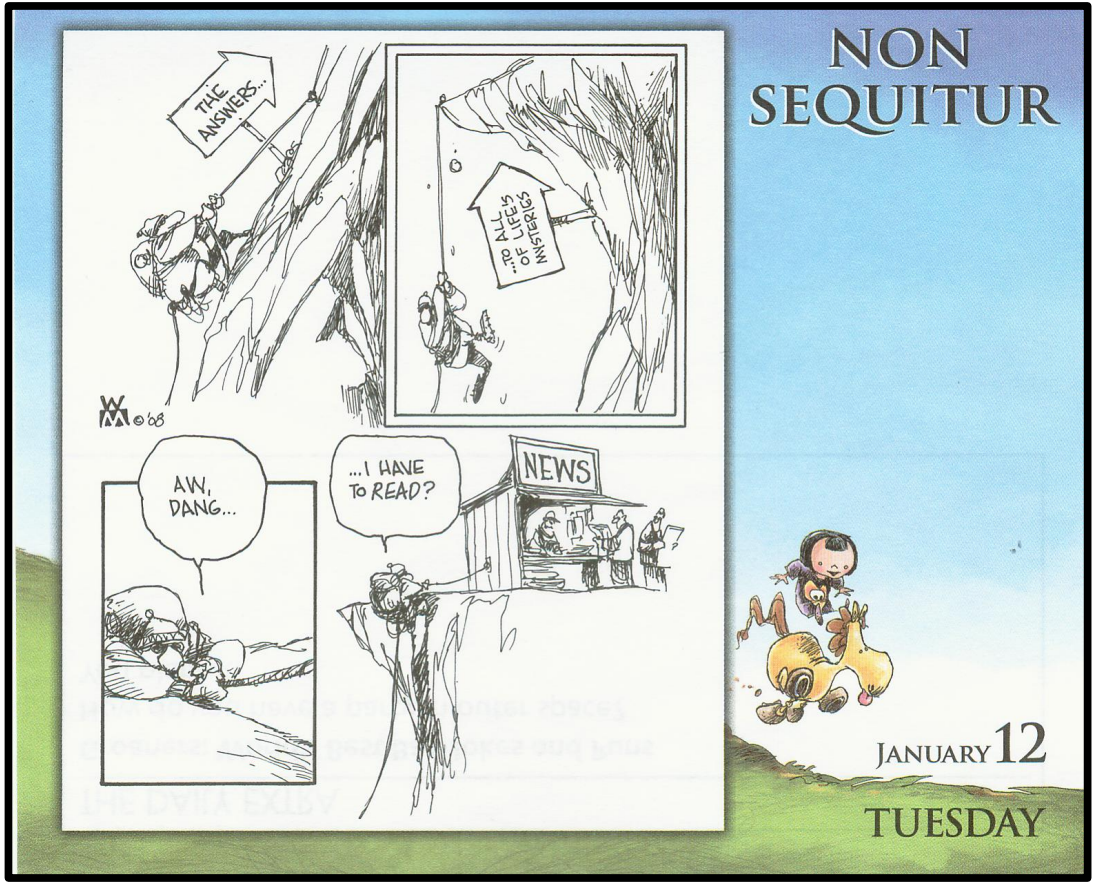
Bloom's Taxonomy
Cognitive Domain

What are examples of higher order thinking?

Examples of using Critical Thinking

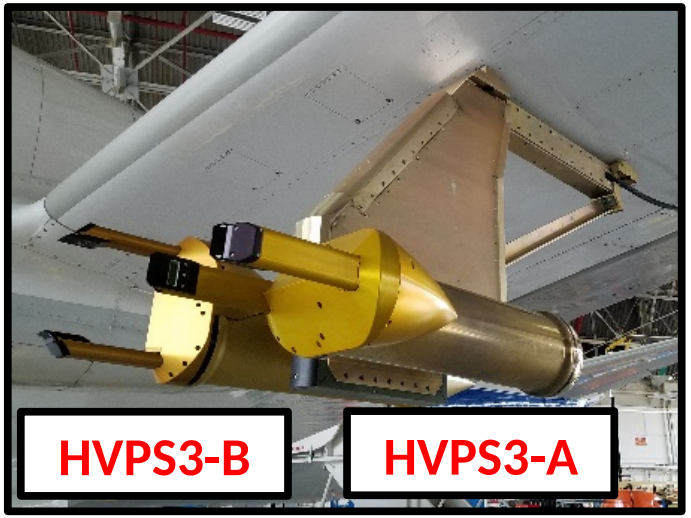
- Approaching Questions
- Solving Problems
- Taking Action

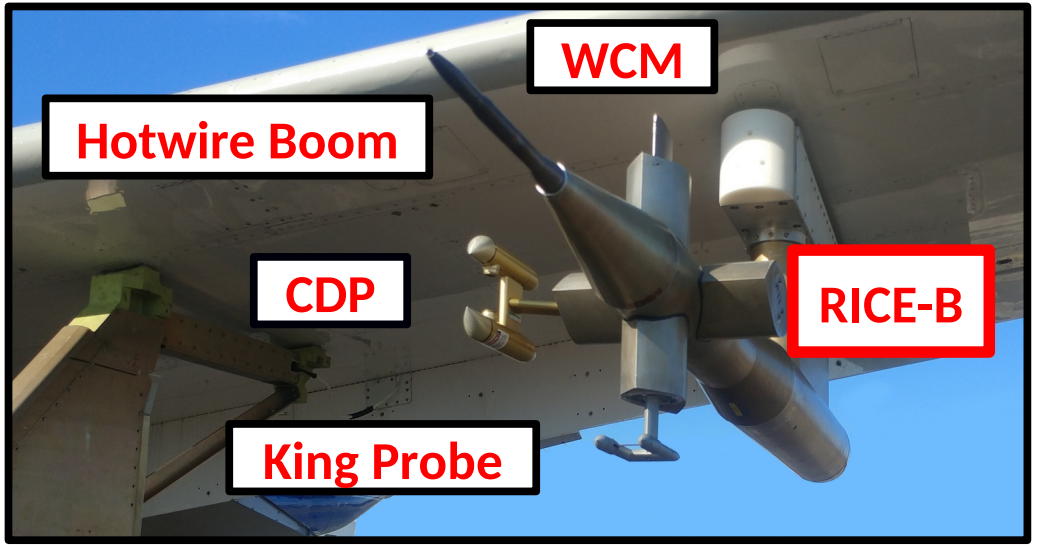
Requires active thinking, the use of reason, and an open mind.



What is an example of how you used critical thinking?

As we Discuss Critical Thinking: How Does it Apply?





Application of Critical Thinking

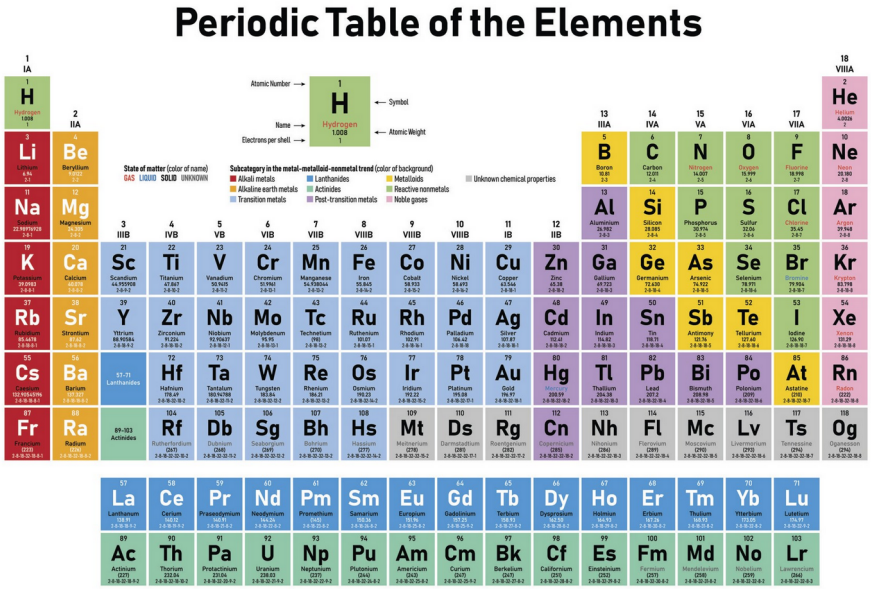
Critical thinking should be applied to:

- Expressing your own thoughts, beliefs, and opinions.
- Reading or listening to the thoughts, beliefs, opinions of others.

How can you apply critical thinking to class lectures?

Elements of Thought and Reasoning

- It has a purpose.
- It is trying to figure something out.
- It is based on assumptions.
- It is done from some point of view.
- It is based on information.
- It is expressed through concepts & theories.
- It contains interpretation of data and observations.
- It has implications and consequences.



Questions Using Elements of Thought

- Purpose
  - What am I trying to accomplish?
- Questions
  - What question am I raising or addressing?
  - Am I considering the complexities?
- Information
  - What information or experience am I using?
  - What information do I need?
- Inferences/Conclusions
  - How did I reach this conclusion?
  - Is there another interpretation?

Questions Using Elements of Thought

- Concepts
  - What is the main idea?
  - Can I explain it?
- Assumptions
  - What am I taking for granted?
  - What have I assumed?
- Implications/Consequences
  - What am I implying?
- Points of View
  - What point of view am I using?
  - Is there another point of view to consider?

Intellectual Standards

- Clarity – Further elaboration, examples
- Accuracy – Verify, check out
- Precision – More specific, further details
- Relevance – Relate to question
- Depth – Complexities and difficulties
- Breadth – Another perspective, other point of view
- Logic – Makes sense, conclusions follow evidence
- Significance – Central idea, most important facts
- Fairness – Vested interest in the issue

Standards and Elements

- Intellectual Standards should be applied to Elements of Thought.
- This approach can be used to:
  - Analyze contents of an article.
  - Analyze and assess research.
  - Help you formulate your own conclusions.
  - Help you take a reasoned stand on an issue.
- This leads to developing Intellectual Traits.

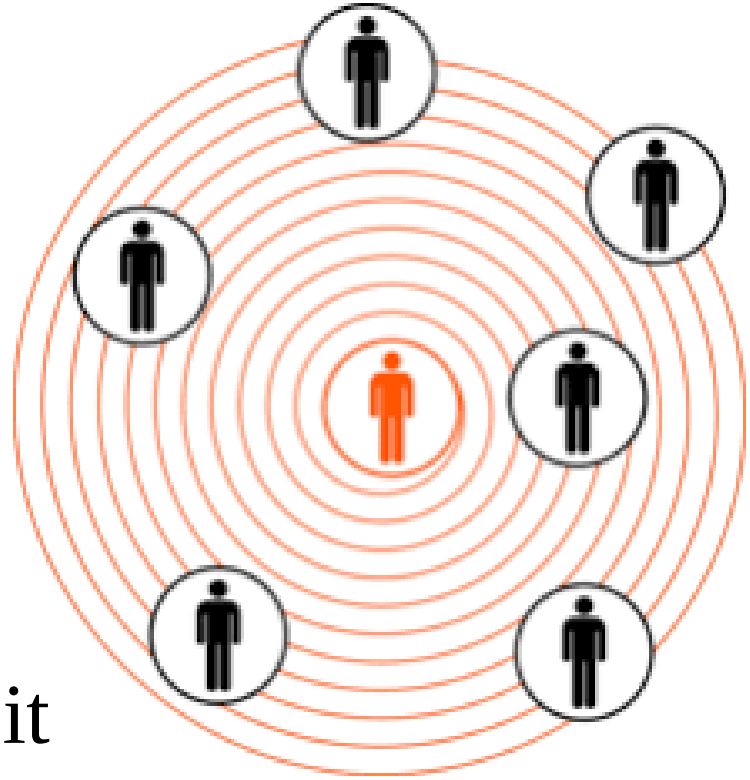
Intellectual Traits

- Intellectual Humility - Realize limits of own knowledge
- Intellectual Courage - Ideas/beliefs/views that counter our own
- Intellectual Empathy - See the other side
- Intellectual Autonomy - Think for yourself
- Intellectual Integrity - Hold yourself to consistent, high standards
- Intellectual Perseverance -Work through confusion
- Confidence in Reason - Believe that high standards will win out
- Fair-mindedness - Treat all viewpoints alike

Egocentric Thinking

It’s true because:

- I believe it
- We believe it
- I want to believe it
- I have always believed it
- It is in my own interest to believe it



Apply Critical Thinking to Weather Modification

- Approaching Questions
- Solving Problems
- Taking Action

Requires active thinking, the use of reason, and an open mind.

Image from cloud seeding in North Dakota on July 2, 2012. Credit: David Delene