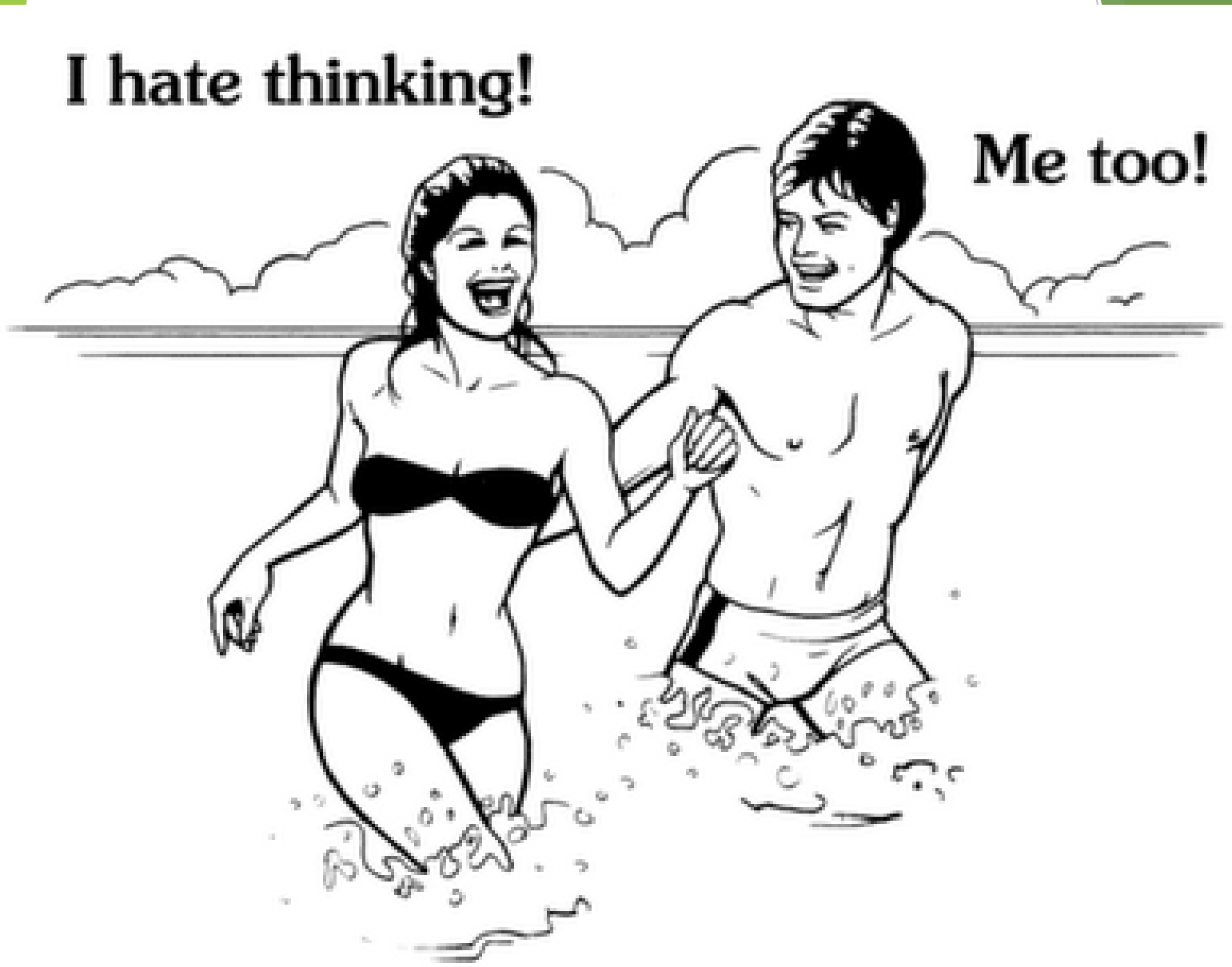
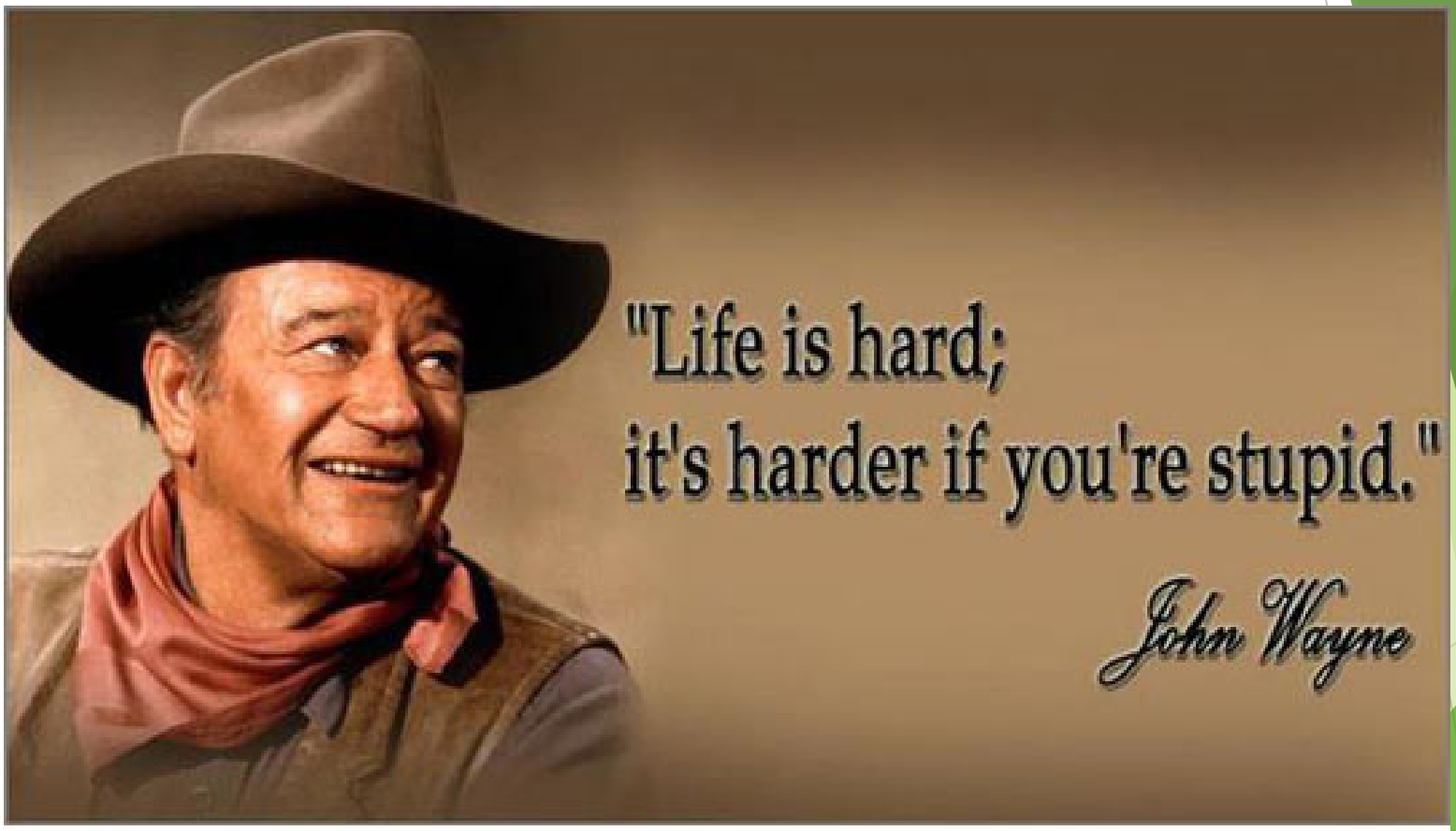

I hate thinking!
Me too!

My justification…



The Explicit Approach

- Basic Assumption: We are all teaching critical thinking (CT) and imparting CT skills – at least in an implicit way
- Problem: the students don't know it
- My approach: Tell them they are expected to be critical thinkers and use the class time to reinforce this focus

Three Prongs of CT

- **Blooms Taxonomy** - this is used solely to inform and make explicit the expectation for the students. It serves as a reference point.

- **Analyzing assumptions** – this is the best way to introduce the process of *meta-cognition*.

- **Holding two opposing ideas in opposition** – this is how students are challenged to defend the basis of their thought patterns AND those with whom they may disagree. Developing this skill can be the basis for developing respect and empathy for others and providing a basis for ethical behavior.

The role of content

- Content is used to provoke critical thinking
- Critical thinking takes time to develop, and time must be spent IN THE CLASSROOM to guide and model the process
- To do this, you have to develop a different classroom experience: flipping the classroom is one alternative

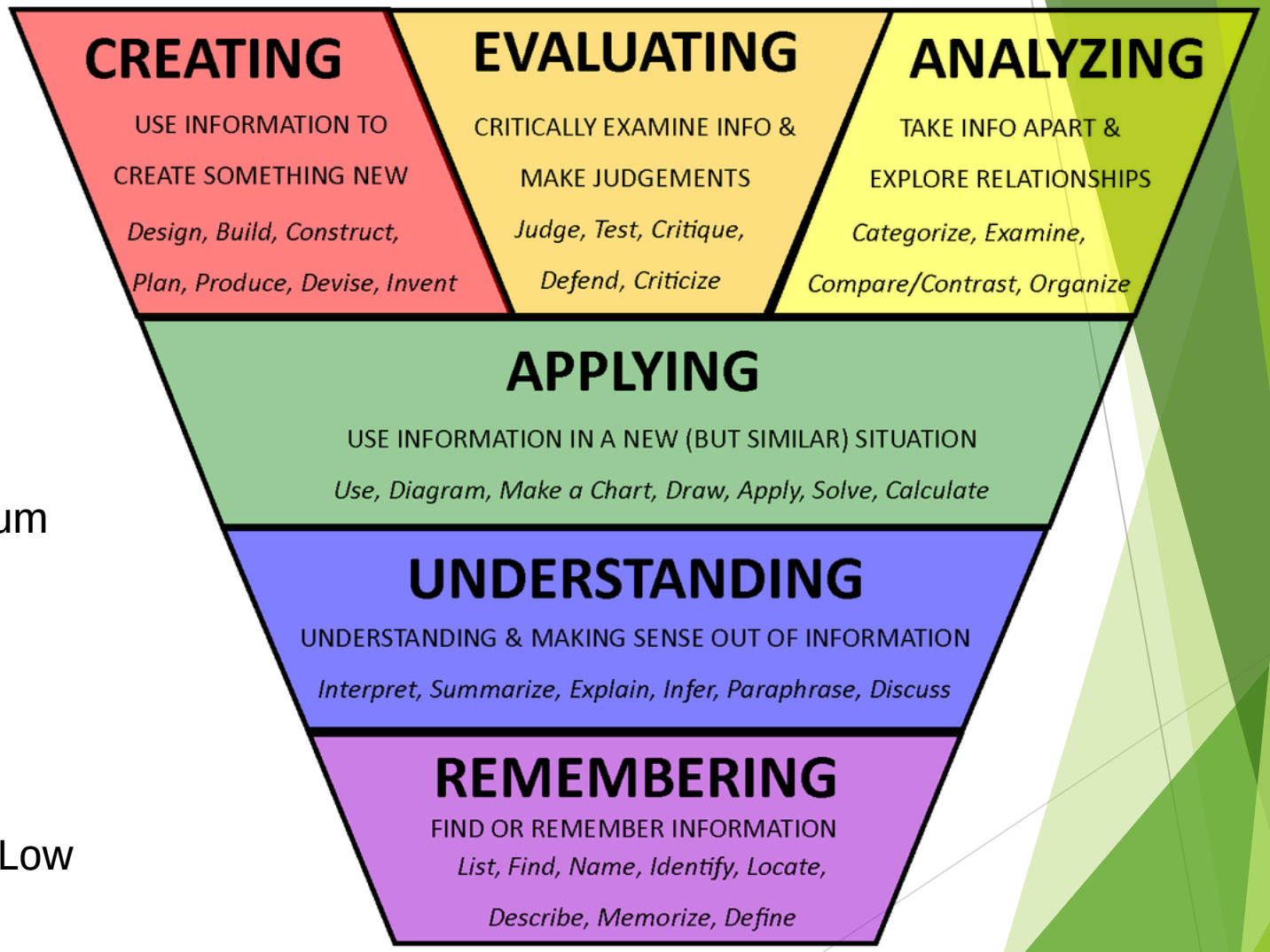
The role of Blooms (Creating = Synthesis)

Outcome Order

High

Medium

Low



CRITICAL THINKING SKILLS

1 Knowledge

Identification and recall of information

define	label	name	state
fill in the blank	locate	recall	tell
list	match	spell	underline
identify	memorize		

Who _____?
What _____?
Where_____?
When _____?

How _____?
Describe _____.
What is _____?

2 Comprehension

Organization and selection of facts and ideas

convert	interpret	restate	summarize
describe	paraphrase	retell in your own words	trace
explain	put in order	rewrite	translate

Re-tell _____ in your own words.
What is the main idea of _____?

What differences exist between _____?
Can you write a brief outline?

3 Application

Use of facts, rules, and principles

apply	demonstrate	give an example	show
compute	determine	illustrate	solve
conclude	draw	make	state a rule or principle
construct	find out	operate	use

How is _____ an example of _____?
How is _____ related to _____?
Why is _____ significant?

Do you know of another instance where _____?
Could this have happened in _____?

4 Analysis

Separating a whole into component parts

analyze	contrast	diagram	examine
categorize	debate	differentiate	infer
classify	deduct	dissect	specify
compare	determine the factors	distinguish	

What are the parts or features of _____?
Classify _____ according to _____.
Outline/diagram/web/map _____.

How does ____ compare/contrast with ___?
What evidence can you present for _____?

5 Synthesis

Combining ideas to form a new whole

change	find an unusual way	predict	revise
combine	formulate	pretend	suggest
compose	generate	produce	suppose
construct	invent	rearrange	visualize
create	originate	reconstruct	write
design	plan	reorganize	

What would you predict/infer from _____?
What ideas can you add to _____?
How would you create/design a new _____?

What solutions would you suggest for ____?
What might happen if you combined _____ with _____?

6 Evaluation

Developing opinions, judgements, or decisions

appraise	decide	judge	rate
choose	defend	justify	select
compare	evaluate	prioritize	support
conclude	give your opinion	rank	value

Do you agree that _____? Explain.
What do you think about _____?
What is most important?

Prioritize _____ according to _____?
How would you decide about _____?
What criteria would you use to assess ____?

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How I do it

- Every class has a specific goal. For example, one class may be devoted to differentiating between Remembering and Understanding. We use the content (assigned reading for that class) as the basis for that differentiation.

- Frequent in-class small group breakups that then present their findings on the board

- Weekly (unscheduled) in-class “Activities”

The in-class “Activities”

- Two goals:

- Reinforce the concept that we should be consciously analyzing our thought processes in an explicit manner in order to improve them

- Reinforce the important concepts that compliment the CT process

Example

The Effect of the Internet on Our Minds

- If you ask a group of students to list the advantages of using the internet, they will generally rank efficiency as the greatest benefit. In general, they view the internet as a useful tool that does not change how they think or how they act. While the effects of the internet on our minds are still being assessed by the scientific community, two distinct viewpoints on its potential effects have emerged.
- In his article *Is Google Making Us Stupid*, Nicholas Carr writes that he is not thinking the same way he used to think. He experiences this sensation most profoundly when he is reading. He finds that after reading a few pages he feels his concentration drifting. His ability to focus on a specific topic for long periods has been diminished. He believes that the internet is to blame because it encourages skimming and power browsing. Carr is complaining that his ability to "read deeply" is being eroded. He believes that the ability to read deeply is directly related to your ability to think deeply.
- In contrast James Zimmer, author of *How Google Is Making Us Smarter*, believes that the internet is allowing us to more efficiently make the world an extension of our minds. He argues that our minds are constantly seeking to merge with tools and the internet is simply another tool in this ongoing natural process. The extended mind theory contends that expanded access to information is allowing us to maximize our intellect and potential. Zimmer believes that there is nothing wrong with our brains being altered by new technologies.

CT questions

1. Which is the lowest order outcome?

(a) The internet is interfering with my ability to read long passages.

(b) The internet is redefining what it means to be smart.

(c) Through merging our minds with the internet, we can solve society's problems.

(d) Given the rapidly changing nature of the internet, the impact on our brains will always be elusive.

CT questions

2. Which is the highest order outcome?

(a) The internet is redefining how to be successful in business.

(b) The internet may be changing the way I think.

(c) The internet makes me more efficient in my life.

(d) The internet has made me a power browser of information.

CT questions

3. Which of the following are typical assumptions made by students about their use of the internet *before* they are exposed to the articles by Carr and Zimmer?

(a) The internet makes me more efficient and does not affect the way I think.

(b) The internet negatively influences the way I think and act.

(c) The internet makes me more efficient but shortchanges my intellect.

(d) The positive benefits of using the internet are overshadowed by its drawbacks.

CT questions

4. Which of the following statements offers both a balanced and insightful view of this issue?

(a) Only by understanding both the potential negative and positive aspects of the internet can we ensure that we use it in a beneficial manner.

(b) Our use of the internet will ultimately lead to a dumbing down of society followed by social upheaval and increased economic disparities.

(c) Because the internet makes my life so much easier, I don't care about the negative effects.

(d) The internet has the potential for both negative and positive outcomes and there is really nothing we can do to change that.

Instructor Guide to Critical Thinking Questions

Before administering the critical thinking questions, it is helpful if you have gone over Bloom's taxonomy with your students and explained the reasoning behind the ordering of the outcomes. The first two quiz questions are designed to coach the student to recognize different levels of thought in the context of Bloom's. The expectation is being made that the students know where they are in the spectrum of outcomes.

A brief discussion about the nature of assumptions will assist the students in answering the rest of the questions. This discussion would involve asking the students how they make decisions and what they believe counts for knowledge, as in how do they know what is the truth. Beliefs are based on (1) their personal experiences (experiential knowledge), (2) what they have been told is true or not true (authoritarian knowledge), and (3) their application of logic. What is important is that they understand that their beliefs, reactions, and perceptions are based on assumptions that they may or may not know they hold. The goal is to make them aware of the multiple assumptions that define their worldview.

Question 1 asks the student to simply remember what they have read in the passage, thus it represents the lowest order outcome which is remembering. Answers (b) -(d) represent higher order outcomes such as application and analysis.

Question 2 is similar but now the student is asked to pick the choice that is not stated in the passage. This correct answer requires analysis and possibly synthesis. Being successful in business is not mentioned in the passage, but the students assume that they are expected to become proficient with the internet since it is a valuable tool for both their personal and professional lives.

Question 3 asks the student to examine their assumptions about the internet. The wording of the question is important as it requires the student to consider the "typical" assumptions made by a user of the internet. Some of the students may already be aware that there are negative aspects of their internet use, but they are being asked to gauge the underlying assumption made by most users.

Question 4 involves using comparative analysis to analyze the pros and cons of their internet use and to recognize that responsible behavior is tied to knowledge. Students are encouraged to form defensible beliefs about both sides of this issue and use those insights to improve their life.