

Critical Thinking

Critical thinking is the product of a combination of a set of interdependent cognitive skills, and a firm commitment to a group of governing attitudes that enables individuals to use a variety of information and methods to make logical and objective decisions. The following model of critical thinking skills and attitudes were developed to help students become aware of the nature of this process and to value it, practice it, and exhibit it during their college experience.

This information was taken from a college psychology class website but all the principals apply in AP Biology.

Skills and Attitudes

The skills and attitudes of a critical thinker include:

Retention

The ability:

- To remember specific information
- To acquire and retain specific psychological terms, definitions, facts, principles, and sequences
- To answer who, what, where, and when questions about psychology
- To remember facts, principles, and steps in sequence

Sample question: What is the definition of psychology?

Comprehension

The ability:

- To grasp the meaning of material
- To understand basic psychological principles, concepts, methods, and theories
- To answer how and why questions about psychology
- To explain, translate, or interpret to a new form or symbol system

Sample question: Why is Wilhelm Wundt known as the founder of empirical psychology?

Application

The ability:

- To use learned material to solve "real-life" problems
- To use psychological principles and methods to change behaviors and mental processes
- To perform psychological research and report the findings in a professional manner
- To use concepts, principles, and theories to find solutions to problems

Sample question: How can parents use extinction to decrease tantrums in children?

Analysis

The ability:

- To study a complicated whole by examining its parts and organizational structure
- To break down complex psychological principles, theories, and methods into their component parts
- To investigate the relationships that exist among the components of complex psychological phenomena
- To determine distinguishing characteristics and show the relationship among parts

Sample question: Compare and contrast the humanistic and psychodynamic approaches to the explanation of personality.

Synthesis

The ability:

- To put parts together to form new and creative wholes
- To put together parts in order to form new wholes
- To produce unique and creative psychological ideas, solutions, hypotheses, and theories
- To combine previously learned material to produce new products (i.e., hypotheses)

Sample question: Use the results of empirical research to answer the question: "Does watching violent television cause children to behave more aggressively?"

Evaluation

The ability:

- To judge the value of material for a given purpose
- To distinguish between fact and fiction, education and propaganda, relevant and irrelevant information, and rational and irrational thoughts and beliefs about psychology
- To identify and use valid criteria and methods during the processes of assessment, diagnosis, and research in psychology
- To make value judgments, rate ideas, and accept or reject materials based on valid criteria

Sample question: Use the criteria discussed in class to assess the validity of Freud's theory.

Attitudes

- Critical thinking is hard work requiring courage to begin and persistence to complete.
- Careful and systematic planning is a prerequisite for any complex intellectual undertaking.
- Errors provide valuable feedback, and knowledge of their causes is foundation for future success.
- For every major issue, there are many different points of view, and all sides of an issue should be investigated thoroughly before a conclusion is reached. To be perceived as

intellectually responsible, individuals must make every effort to understand the perspective of those with whom they disagree.

- An attitude of healthy skepticism is a valuable tool, especially when confronted with slanted, selective, prejudiced, or self-justifying information.
- The assumptions of a theory, tradition, or belief must be analyzed carefully and understood completely before it can be either accepted or rejected.
- It is perfectly acceptable, and often desirable, for individuals to change their beliefs, values, or behaviors if presented with sufficient empirical evidence or logical justification to do so.
- Those with whom we agree are not always right and those with whom we disagree are not always wrong. When disagreeing, it is best to do so in an agreeable manner--disagreements should produce constructive discussion, not arguments.
- There are no simplistic, dogmatic explanations of complex phenomena. It is often necessary to look beyond obvious, common sense, or traditional answers to discover valid relationships.
- Many theories can be used to explain behavior. The theory an individual chooses to embrace is dependent upon that person's unique set of academic, cultural, spiritual, methodological, professional, and personal values.
- Many methods can be used to study behavior. The appropriateness of a particular method is determined by a careful determination of its purpose and the individuals, situations, and ethical principles involved.
- Learning is a life-long process that can occur in the absence of any formal educational process. Critical thinkers learn from their teachers, but they can also learn by themselves long after their formal education has ceased.

Critical Thinking Questions

In the field of psychology, several critical thinking questions should regularly be exercised:

1. What is the quality of the evidence to support the claim? *In general, the evidence is very weak if the person has only testimonial or anecdotal evidence or no evidence at all; the evidence is quite strong if the person's findings have been published in a respectable scientific journal and other researchers have replicated the findings.*
2. Could the event or relationship have occurred by chance? *For example, you just happened to have a car accident on the day that a psychic predicted your car would be damaged.*
3. Is there a control or comparison group against which to assess the performance of the experimental group?
4. Is the person concluding that there is a causal relationship on the basis of correlational data?
5. Are there confounding variables that might account for the findings? *For example, participants selecting themselves into groups, experimenter expectancies, demand*

characteristics, or some other variable that varies systematically with the independent variable.

6. Is the person trying to generalize the findings to a larger group based on a biased or unrepresentative sample?
7. Did the person ask questions of participants in a biased manner? *For example, asking leading questions, loaded or emotional wording, or confusing wording.*
8. Has the person made it impossible to falsify his/her theory or hypothesis? Does he/she consider positive evidence as support of the theory, but negative evidence as not being relative? Does he/she claim that the phenomenon disappears once you try to test it?
9. Is the person claiming to have found **the** cause of some behavior or phenomenon?
Remember that most complex behaviors have multiple causes.

Adapted from: Appleby, D. (1997). *The Handbook of Psychology*. New York: Longman; as well as from (1999). *The Journal for the Teaching of Psychology*, 26 (3), 209