

**Metadisciplinary Outcomes for Science Literacy**  
**(Can Assess Now by Standardized Concept Inventory)**

**STUDENTS SHOULD BE ABLE TO...**

1. Define the domain of science and determine whether a statement constitutes a hypothesis that can be resolved within that domain.
2. Describe through example how science literacy is important in everyday life to an educated person.
3. Explain why the attribute of doubt has value in science.
4. Explain how scientists select which among several competing working hypotheses best explains a physical phenomenon.
5. Explain how "theory" as used and understood in science differs from "theory" as commonly used and understood by the general public.
6. Explain why peer review generally improves our quality of knowing within science.
7. Explain how science employs the method of reproducible experiments to understand and explain the physical world.
8. Articulate how science's way of knowing rests on some assumptions.
9. Distinguish between science and technology by examples of how these are different frameworks of reasoning.
10. Cite a single major theory from one of the science disciplines and explain its historical development.
11. Explain and provide an example of how modeling is used in science.
12. Explain why ethical decision-making becomes increasingly important to a society as it becomes increasingly advanced in science.

## DRAFT: Metadisciplinary Outcomes for the Arts

Students should be able to...

1. Explain the significance of creative expression within the human experience.
2. Discern objective vs. subjective scholarship, criticism, and analysis of the Arts.
3. Communicate ideas and emotions through the practice and/or study of the Arts.
4. Recognize and describe creative expression from different cultural and historical perspectives.
5. Articulate the process of reasoning used in the creation of art (also referred to as the “Creative Process” or “Creative Problem Solving”).
6. Describe, using at least two specific examples, how art can impact everyday life.

## DRAFT: Metadisciplinary Outcomes for Social Science

Students should be able to...

1. explain the development of social and historical issues and problems.
2. critically analyze texts dealing with historical and contemporary problems and issues.
3. access sources and materials applicable to their own research within their discipline.
4. utilize appropriate sources to conduct their own analysis of social, historical, political, economic issues.
5. communicate effectively in written and oral form with regard to social and historical issues.
6. incorporate a consideration of culture and individual differences (including positions of privilege and power) in shaping social and historical experiences.
7. explain major theories that have shaped the interpretation of social and historical problems.

## DRAFT: Metadisciplinary Outcomes for Humanities

Students should be able to...

1. Communicate issues orally and in writing through providing the relevant information needed for clear understanding to an intended audience.
2. Construct a clear analysis or synthesis of an argument based on conflicting evidence furnished by high quality information sources.
3. Present an evidence-based argument that shows recognition of the relevance of context in making a decision.
4. Present an evidence-based argument that shows recognition of the validity of multiple conflicted viewpoints.
5. Render conclusions and decisions based on consideration of multiple perspectives and prioritization of available evidence.
6. Render conclusions/decisions to appropriate problems by applying the major concepts of an ethical framework of reasoning.
7. Explain the value to self that arises from acquiring the ability to use the frameworks of logic and ethical reasoning developed in the humanities.

## **DRAFT: Metadisciplinary Outcomes for Quantitative Literacy**

"A quantitatively literate college graduate should be able to...

- 1. Interpret mathematical models such as formulas, graphs, tables, and schematics, and draw inferences from them.**
- 2. Represent mathematical information symbolically, visually, numerically, and verbally.**
- 3. Use arithmetical, algebraic, geometric and statistical methods to solve problems.**
- 4. Estimate and check answers to mathematical problems in order to determine reasonableness, identify alternatives, and select optimal results.**
- 5. Recognize that mathematical and statistical methods have limits.**

(From

<http://www.maa.org/programs/faculty-and-departments/curriculum-department-guidelines-recommendations/quantitative-literacy/quantitative-reasoning-college-graduates#Part2>, 1994. Used - with minor modifications in subsequent national discussions about quantitative reasoning.) .

## DRAFT: Metadisciplinary Concepts for Technology

### **Students will be able to...**

1. Provide case examples of creative and critical thinking as employed in an actual application of the technological framework of reasoning.
2. Explain the role of ethics in the practice of technology's professions.
3. Explain some approaches that technology experts can employ to increase successful communication with their clients and with laypersons.
4. Explain how technology's framework of reasoning differs from that of science or the arts.
5. Explain why development of professional competency in the technology professions commonly requires extended periods of mentoring.
6. Explain how expert practitioners of technology develop “informed affective domains” that enable effective utilization of knowledge and skills guided by nonverbal intuition.