Scientific Literacy Defined



Definition of Scientific Literacy

- Scientific literacy is a malleable phrase
 - > Different definitions for different sub-populations
- For general population defined as:
 - the knowledge and understanding of scientific concepts and processes required for personal decision-making
 - the ability to ask or find answers to questions, read with understanding articles about science in the popular press, and express positions that are scientifically and technologically informed



Definition of Scientific Literacy

for Pre/Early Freshmen STEM Majors & High School Students Interested in a STEM Major

Scientific Literacy is defined as:

- 1. the knowledge and understanding of the nature and development of science and scientific research
- 2. the knowledge of the interdisciplinary nature of STEM
- 3. possessing the ability to analyze and evaluate scientific evidence and explanations 🥚 🔴
- 4. having the ability to participate productively in scientific discourse through practice
- 5. demonstrating improve aptitude for <u>quantitative literacy</u>/reasoning, scientific reasoning and <u>critical and</u> <u>creative thinking</u>
- 6. possessing a relevant knowledge of STEM disciplines and career opportunities in STEM
- 7. the ability to operate effectively in team learning and discovery
- 8. <u>possessing a scientist identity</u> and STEM self-efficacy, as well as other relevant attitudes and intellectual behaviors for success in STEM
 - ** Scientific Literacy happens when students think for themselves (Rissing, 2007)
 - ** Color Coded for Bloom's Taxonomy

Scientific Literacy, Intellectual Behavior & Bloom's Taxonomy

Benjamin Bloom, an educational psychologists, developed a classification of levels of intellectual behavior important in learning. Bloom found that over 95% of the test questions students encounter require them to think only at the lowest possible level...the recall of information. Bloom identified six levels within the cognitive domain, from the simple recall or recognition of facts (knowledge), as the lowest level, through increasingly more complex and abstract mental levels.

- 1. Knowledge: memorize, name, identify, recite
- 2. Understand: describe, classify, explain, discuss
- 3. Apply: apply, employ, choose, practice, operate
- 4. Analyze: compare, contrast, calculate, test
- 5. Evaluation: argue, assess, defend, judge
- 6. Create: construct, design, develop, formulate, plan, propose



Based on an APA adaptation of Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001)



Scientific Literacy Activities Build Intellectual Behavior



You must first know, remember and understand the details of a particular field of science, before you can apply, analyze, evaluate and create in that field.

Intellectual Behavior Examples



MOREHOUSE SCIENTIFIC LITERACY CENTER

Beyond Scientific Literacy: Ph.D. (Doctor of Philosophy)





Definition of Doctorate

• Highest academic degree in a given field of study

Definition of Philosophy

- Love and <u>pursuit of wisdom</u> by intellectual means and self-discipline.
- <u>Investigation</u> of the nature, causes, or principles of <u>reality</u>, knowledge, or values, based on logical <u>reasoning</u>
- <u>A system of thought based on or involving such</u> inquiry
- The <u>critical analysis</u> of fundamental assumptions or beliefs
- The disciplines presented in university curriculums of <u>science and the liberal arts</u>, except medicine, law, and theology