

12 Concepts in the Science Literacy Concept Inventory (SLCI)

As developed by multi-disciplinary team at California State University-Channel Islands

The Science Literacy Concept Inventory was designed to evaluate students' progress toward 12 key science concepts that apply across disciplines. *Examples of student performance follow.*

1. Science explains physical phenomena based upon *testable* information about the physical world.
Student can articulate in her/his own words a reasonable definition for what constitutes science.
2. In modern life, science *literacy* is important to both personal and collective decisions that involve science content and reasoning.
Student can describe, using at least two specific examples, how science literacy is important in everyday life to an educated person.
3. *Doubt* plays necessary roles in advancing science.
Student can explain why the attribute of doubt has value in science.
4. Scientists use *evidence-based reasoning* to select which among several competing working hypotheses best explains a physical phenomenon.
Student can explain how scientists select which among several competing working hypotheses best explains a physical phenomenon.
5. A *theory* in science is a unifying explanation for observations that result from testing several hypotheses.
Student can explain how "theory" as used and understood in science differs from "theory" as commonly used and understood by the general public.
6. *Peer review* generally leads to better understanding of physical phenomena than can the unquestioned conclusions of involved investigators.
Student can explain why peer review generally improves our quality of knowing within science.
7. Science can test certain kinds of hypotheses through controlled *experiments*.
Student can explain how science employs the method of reproducible experiments to understand and explain the physical world.
8. All science rests on fundamental assumptions about the *physical world*.
Student can name one assumption that underlies all science.
9. Science differs from *technology*.
Student can provide two examples of science and two of technology and use these to explain a central concept by which one can distinguish between science and technology.
10. Scientific knowledge is *discovered*, and some discoveries require an important history.
Student can cite a single major theory from one of the science disciplines and explain its historical development.
11. Science employs *modeling* as a method for understanding the physical world.
Student can explain and provide an example of modeling as used in science.
12. Scientific knowledge imparts power that must be used *ethically*.
Student can explain why awareness of ethics becomes increasingly important to a society becoming increasingly advanced in science.