

## 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.*