



Standard #: SC.912.N.2.5

This document was generated on CPALMS - www.cpalms.org

Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.

General Information

Subject Area: Science

Grade: 912

Body of Knowledge: Nature of Science

Idea: Level 3: Strategic Thinking & Complex Reasoning

Standard: [The Characteristics of Scientific Knowledge](#) -

Date Adopted or Revised: 02/08

A: Scientific knowledge is based on empirical evidence, and is appropriate for understanding the natural world, but it provides only a limited understanding of the supernatural, aesthetic, or other ways of knowing, such as art, philosophy, or religion.

B: Scientific knowledge is durable and robust, but open to change.

C: Because science is based on empirical evidence it strives for objectivity, but as it is a human endeavor the processes, methods, and knowledge of science include subjectivity, as well as creativity and discovery.

Content Complexity Rating: [Level 3: Strategic Thinking & Complex Reasoning](#) - [More Information](#)

Date of Last Rating: 05/08

Status: State Board Approved

Related Courses

Course Number	Course Title
2001350:	Astronomy Solar/Galactic (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2020910:	Astronomy Solar/Galactic Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2000330:	Biology 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 - 2022 (current), 2022 and beyond)
2003340:	Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003350:	Chemistry 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003360:	Chemistry 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2001310:	Earth/Space Science (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2001320:	Earth/Space Science Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2000380:	Ecology (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002410:	Integrated Science 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002420:	Integrated Science 2 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002440:	Integrated Science 3 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002450:	Integrated Science 3 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2000390:	Limnology (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated))
2002500:	Marine Science 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002510:	Marine Science 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002520:	Marine Science 2 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002530:	Marine Science 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003400:	Nuclear Radiation (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated))
2020710:	Nuclear Radiation Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003310:	Physical Science (Specifically in versions: 2015 - 2022 (current), 2022 and beyond)
2003320:	Physical Science Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003380:	Physics 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003390:	Physics 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003410:	Physics 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003600:	Principles of Technology 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003610:	Principles of Technology 2 (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated))
2002540:	Solar Energy Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002550:	Solar Energy 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated))

2002330:	Space Technology and Engineering (Specifically in versions: 2014 - 2015, 2015 - 2018 (course terminated))
2003800:	Florida's Preinternational Baccalaureate Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002340:	Experimental Science 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002350:	Experimental Science 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002360:	Experimental Science 3 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002370:	Experimental Science 4 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
7920011:	Access Chemistry 1 (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 and beyond (current))
7920020:	Access Earth/Space Science (Specifically in versions: 2014 - 2015, 2015 - 2018, 2018 and beyond (current))
2000500:	Bioscience 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2000510:	Bioscience 2 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2000520:	Bioscience 3 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2002425:	Integrated Science 2 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2020 (course terminated))
2002445:	Integrated Science 3 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2020 (course terminated))
2003345:	Chemistry 1 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003385:	Physics 1 for Credit Recovery (Specifically in versions: 2014 - 2015, 2015 - 2020 (course terminated))
2003500:	Renewable Energy 1 Honors (Specifically in versions: 2014 - 2015, 2015 - 2022 (current), 2022 and beyond)
2003836:	Florida's Preinternational Baccalaureate Physics 1 (Specifically in versions: 2015 - 2022 (current), 2022 and beyond)
2003838:	Florida's Preinternational Baccalaureate Physics 2 (Specifically in versions: 2015 and beyond (current))
7920022:	Access Physical Science (Specifically in versions: 2016 - 2018, 2018 and beyond (current))
2001330:	Meteorology Honors (Specifically in versions: 2016 - 2019, 2019 - 2022 (current), 2022 and beyond)

Related Access Points

Access Points Number	Access Points Title
SC.912.N.2.Pa.1:	Recognize an example of work by scientists.
SC.912.N.2.In.4:	Identify major contributions of scientists.
SC.912.N.2.Su.3:	Recognize major contributions of scientists.

Related Resources

Lesson Plans

Name	Description
Languages: Barriers to Global Science?:	In this lesson, students will analyze an informational text intended to support reading in the content area. The research article discusses different languages as barriers to the transfer of knowledge within the scientific community and then provides potential resolutions to aid in the reduction of language barriers. This lesson includes a note-taking guide, text-dependent questions, a writing prompt, answer keys, and a writing rubric.
Cleaning Up Your Act:	Cleaning Up Your Act Model Eliciting Activity (MEA) provides students with a real world engineering problem in which they must work as a team to design a procedure to select the best material for cleaning up an oil spill. The main focus of this MEA is to recognize the consequences of a catastrophic event, and understand the environmental and economical impact based on data analysis. Students will conduct individual and team investigations in order to arrive at a scientifically sound solution to the problem.
Profile: Judah Folkman Cancer Research:	This PBS/NOVA lesson combines a discussion of the Nature of Science using a renowned Cancer researcher (and supported by the profiles of several other renowned scientists in the activities) to study concepts of creativity and tentativeness in the Nature of Science with a study of the biological characteristics of cells in disease (cancer).
T Rex Blood?:	A PBS Nova Podcast/Video with accompanying activities that introduce and explore paleontology and the geologic timescale through analysis of fossil bones.

Perspectives Video: Expert

Name	Description
Birdsong Series: STEM Team Collaboration :	Researchers Frank Johnson, Richard Bertram, Wei Wu, and Rick Hyson explore the necessity of scientific and mathematical collaboration in modern neuroscience, as it relates to their NSF research on birdsong.
	Download the CPALMS Perspectives video student note taking guide .

Teaching Ideas

Name	Description
CERN:	This PBS/NOVA presentation tells the story of the CERN and the Large Hadron Collider project - an amazing ongoing investigation in search of an answer to the mysteries that still exist in particle physics. Recommended discussions and activities before and after the video are provided.
Island of Stability:	A video and supporting activities about the Periodic Table. The context is man's quest to create elements. The focus is atomic structure and atomic theory.

Text Resources

Name	Description
	This informational text resource is intended to support reading in the content area. The article describes a Google

Languages Are Still a Major Barrier to Global Science:	Scholar survey, focusing on environmental issues, as the basis for presenting an argument that language is a barrier to global communication in the scientific community. The recognized barriers are two-fold: the limitation of knowledge transfer and the inability of local policy makers to make decisions based on existing knowledge. The article provides possible solutions to the problem, including the "multilingualization" of texts through changes in journal requirements.
The Weird, Wild World of Citizen Science is Already Here:	This informational text resource is intended to support reading in the content area. This article describes the collision course between citizens and scientists as "makers" and "hobbyists" begin aiding and supplementing the scientific community more and more. The article gives many examples of amateurs helping out on active projects, especially when science cannot dedicate the hours or money necessary to complete them.
Errors in the Movie "Jurassic Park":	This informational text resource is intended to support reading in the content area. A group of teachers asked for scientific comments on the film Jurassic Park. The article is an edited compilation of these responses--the paleontological, ecological, and biological "errors" found in the movie. The article attempts to correct many inaccuracies and misconceptions and demonstrates how scientists' backgrounds influence their interpretations.
The Story of Serendipity:	The article explains how some famous scientific discoveries that happened "by accident" more accurately resulted from scientific habits of mind, which allowed researchers to take full advantage of these serendipitous moments.
The Structure of DNA: Cooperation and Competition:	The insight, innovation, and persistence of James Watson, Rosalind Franklin, Francis Crick, and Maurice Wilkins led to a detailed understanding of the structure of DNA, the stuff that genes are made of. This discovery brought together information from many disciplines and many researchers to answer one of the most fundamental questions in life science: How do living things pass on traits to their offspring?

Unit/Lesson Sequence

Name	Description
Modeling for Understanding Natural Selection:	This series of lessons introduces students to evolutionary reasoning and to the explanatory power of the Darwinian model of natural selection. Students read three evolutionary scientists' (Paley, Lamarck and Darwin) original work and compare their thinking, proposed mechanism of evolution, use of evidence, and explanatory power of their theory. They apply the three scientists thinking to another scenario to refine their understanding of the explanations.