

SCIENCE 2007*

Science

SCIENTIFIC LITERACY: A goal for Alabama's K-12 Science Education Program.

Scientific literacy for all Alabama students is the goal of Alabama's K-12 science education program. The "Alabama Course of Study: Science (Bulletin 2005, No 20)" defines the minimum required content that students need to achieve this goal.

The "National Education Standards" produced by the National Research Council (NRC) has established scientific literacy as a national goal of science education, and it continues to be a goal for Alabama students. Scientific literacy enables students to use scientific principles and processes in everyday life to make informed decisions. A solid foundation in science helps to develop and strengthen many of the skills that students use daily such as solving problems creatively, thinking critically, working cooperatively in teams, practicing stewardship of natural resources, and using technology effectively. The scientifically literate person is more likely to face with confidence the challenges of an ever-changing global society. Moreover, the economic productivity of Alabama is linked to the scientific and technological skills of the workforce.

To help students achieve scientific literacy and make sound decisions, THE K-12 SCIENCE PROGRAM PLACES A RENEWED EMPHASIS ON THE IMPORTANCE OF TEACHING SCIENCE EVERY DAY TO EVERY STUDENT IN EVERY GRADE.

Scientific literacy is best achieved through a K-12 science program that is inquiry-based and incorporates scientific knowledge, skills, and opportunities to apply both in practical ways. The high school curriculum is the last experience with formal education instruction for some students. To enable all students to become scientifically literate, the science curriculum in grades 9-12 must provide students with knowledge and skills necessary for the twenty-first century. All science courses grades 9-12 are laboratory based courses.

Forensic Science

This lab-based course will focus on crime scene analysis, DNA evidence, blood evidence, fiber evidence, forensic dentistry, serology, theory, and laboratory skills of modern DNA forensics. Topics will include, but not be limited to, genetics and immunology.

Process and Applications Skills

Science & Technology & Society P

The learner will be able to demonstrate an understanding of the relationships among science, technology, and society past and present. Examples: explaining how scientists use technology in scientific research, recognizing the importance of science and technology to many careers, demonstrating and discovering how DNA finger printing is used to solve a crime. P149/48 & P153/48.

Safety: Materials, Organisms...X

The learner will be able to identify safe laboratory procedures when handling chemicals, using Bunsen burners, and using laboratory glassware. AHSGE/I-1C.

Sci. Investigation: Design/Conduct X

The learner will be able to analyze the methods of science to identify and solve problems. COS; AHSGE/I-1.

Sci. Investigation: Sorting...X

The learner will be able to order the proper sequence of steps within the scientific process. AHSGE/I-1F.

Sci. Investigation: VariablesX

The learner will be able to identify and distinguish between controls and variables in a scientific investigation. AHSGE/I-1B.

Sci. Investigation: Hypotheses X

The learner will be able to define and identify examples of hypotheses. AHSGE/I-1E.

Sci. Investigation: Models, Tables..X

The learner will be able to use process skills to interpret data from graphs, tables, and charts. AHSGE/I-1A.

Sci. Investigation: Measuring X

The learner will be able to select appropriate laboratory glassware, balances, time measuring equipment, and optical instruments to conduct an investigation. AHSGE/I-1G.

Measurements: Systeme International (SI)X

The learner will be able to identify and use appropriate Systeme International (SI) units for measuring dimensions, volume, and mass. AHSGE/I-1D.

Forensic Science

Crime Scene Investigation Personnel C1

The learner will be able to describe responsibilities of various personnel involved in crime scene investigations. Examples: police, detectives, laboratory specialists, medical examiners. COS, Page 56, #1.

Crime Scene Data C1a

The learner will be able to explain how to search, sketch, and record data from a crime scene. COS, Page 56, #1a.

Crime Scene & Evidence Preservation C2

The learner will be able to explain ways to collect and preserve evidence from a crime scene. COS, Page 56, #2.

Physical Evidence & Witness Evidence C2a

The learner will be able to distinguish between physical evidence and witness evidence. COS, Page 56, #2a.

Fingerprint Patterns C2b

The learner will be able to compare the three main pattern types that combine to form an individual's unique fingerprint. COS, Page 56, #2b.

Latent Fingerprint Development C2c

The learner will be able to explain different methods of latent fingerprint development. COS, Page 56, #2c.

Origins of Impressions C2d

The learner will be able to identify origins of impressions, including footwear and tire treads. COS, Page 56, #2d.

Evidence: Hair, Fiber & Blood C2e

The learner will be able to describe ways to identify hair, fiber, and blood evidence. COS, Page 56, #2e.

Firearms: Distinguish C3

The learner will be able to distinguish between class and individual characteristics of firearms. Examples: toolmark, caliber, scatter pattern. COS, Page 56, #3.

Presumptive & Confirmatory Tests C4

The learner will be able to describe presumptive and confirmatory tests. Examples: blood type comparison, DNA testing. COS, Page 56, #4.

Genetic Information & Forensics C5

The learner will be able to describe the importance of genetic information to forensics. COS, Page 56, #5.

DNA Patterns & Gel Electrophoresis C5a

The learner will be able to use the process of gel electrophoresis to identify patterns in DNA. COS, Page 56, #5a.

Decomposition Process C6

The learner will be able to describe the decomposition process. COS, Page 57, #6.

Rigor Mortis & Corpse Position C6a

The learner will be able to use rigor mortis to determine corpse position. COS, Page 57, #6a.

Decomposition By-Products: Death...C6b

The learner will be able to identify decomposition by-products to determine cause of death. COS, Page 57, #6b.

Entomological Life Cycles & Death

The learner will be able to use entomological life cycles to determine time of death. COS, Page 57, #6c.

Skeletal Remains & Forensics C7

The learner will be able to identify the importance of skeletal remains in forensics. COS, Page 57, #7.

Bones & Skull: Age, Sex & Race C7a

The learner will be able to compare bones and skulls based on age, sex, and race. COS, Page 57, #7a.

Forensic Dentistry & Identity C7b

The learner will be able to use forensic dentistry to establish identify. COS, Page 57, #7b.

Effects of Drugs & Poisons C8

The learner will be able to describe general categories of drugs and poisons and their effects on humans COS Page 57 #8.

Poisons Detected at Autopsy C8a

The learner will be able to explain ways poisons are detected at autopsy. COS, Page 57, #8a.

Forensic Evidence & Laws of Physics C9

The learner will be able to use laws of physics to explain forensic evidence. COS, Page 57, #9.

Blood Spatter Patterns C9a

The learner will be able to analyze blood splatter patterns in relation to speed, height, and direction. COS, Page 57 # 9a.

Tracking Trajectories C9b

The learner will be able to tracking trajectories of collected evidence. COS, Page 57, #9b.

Validity of Documents C10

The learner will be able to describe techniques used to determine the validity of documents. Examples: fiber and handwriting analyses, ink chromatography. COS, Page 57, #10.

Solving a Crime Scene

The learner will be able to synthesize and use all of the above objectives to solve a crime scene at the termination of the course.