



Forensic Autopsy Cadaver Demonstration High School

This guide is for high school students participating in the AIMS Forensic Autopsy Cadaver Demonstration. Programs will be presented by an AIMS Anatomy Specialist. The program will discuss the basic procedures of a forensic autopsy, highlighting the principles of objectivity, the scientific method and evidence gathering. During this activity, students will be exposed to the physiology and anatomic relationships of the major organ systems of the body as it relates to forensics. Students will become more familiar with the anatomical structures of the human body by observing, studying and examining human specimens. Included in this guide, you will find additional resources such as important terminology and pre/post tests for your students.

National Science Education (NSES) Content Standards

Content Standard K-12	Unifying Concepts and Processes: systems order and organization; evidence, models and explanation; form and function
Content Standard A	Science as Inquiry
Content Standard C	Life Science: matter, energy and organization of living systems
Content Standard F	Science in Personal Health and Social Perspectives: personal and community health

Show Me Standards (Science and Health/Physical Education)

Science 1	Properties and principles of matter and energy
Science 3	Characteristics and interactions of living organisms
Health/Physical Education 1	Structures of, functions of and relationships among human body systems
Health/Physical Education 2	Principles and practices of physical and mental health
Health/Physical Education 3	Diseases and methods for prevention, treatment and control
Health/Physical Education 4	Principles of movement and physical fitness
Health/Physical Education 5	Methods used to assess health, reduce risk factors, avoid high-risk behaviors

Missouri Learning Standards

Life Sciences (9-12.LS1.A.2)	Interacting systems that provide specific functions within multicellular organisms
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Lesson Objectives:

Students will participate in the use of a cadaver as a learning tool for health science and forensic education.

Students will be able to identify the proper guidelines for evidence gathering.

Students will be able to discuss the basic procedures of forensic autopsy.

Students will increase their understanding of the postmortem processes which assist in determining time and cause of death.

Students will increase their understanding of terms and procedures associated with a forensic autopsy.

Students will increase their understanding of the structures, functions and relationships among the major organs and body systems.

Preparation:

Students should be familiar with terms relating to forensics. Please review the forensic autopsy terminology/vocabulary prior to the program. Our AIMS Anatomy Specialist will take questions from students about procedures and anatomy while the program is taking place.

Materials:

Review of Terminology/Vocabulary Reference Guide

Pre/Post Test

Forensic Autopsy Cadaver Demonstration

Terminology/Vocabulary Reference Guide

Algor mortis	Term used to describe the cooling of the body after death; will vary depending on multiple factors, including original body temperature, ambient temperature, clothing and environmental conditions on site
Anthropology	A study of the origin and behavior of humans, as well as the physical, social and cultural development of humans. The forensic anthropologist studies human skeletal remains to determine the age, sex and race of the deceased, identify any illness or injury that they may have suffered and to establish time of death. Also involved extensively in identifying victims of mass disasters and those interred in mass graves.
Asphyxia	A condition caused by inadequate intake of oxygen
Autopsy	From the Greek meaning “to see for one’s self”; a postmortem assessment that consists of a thorough examination of a body to determine the cause and manner of death to evaluate any disease or injury that may be present.
Bloating	Accumulation of gasses under the skin due to the formation of gasses by bacterial action and putrefaction of the internal tissues of the abdomen and the inside of the intestines
Botany	The scientific study of plant life. The forensic botanist may examine plant fragments, pollen and soil to determine if a body has been moved or if a suspect was at a particular crime scene.
Cause of death	The disease process or injury responsible for initiating the train of events, brief or prolonged, which produces the fatal end result
Coroner	An appointed or elected position that formally requires no special medical or forensic skills
Death Certificate	A legal document signed by a physician or other designated authority that identifies the deceased, as well as declares the cause, date, time and location of death
Entomology	A branch of zoology that deals with the scientific study of insects. The forensic entomologist uses knowledge of the life cycles of flies and various other insects that feed on corpses to determine the approximate time of death, as well as determine whether or not a body has been moved from one location to another.
Exsanguination	Extensive loss of blood due to internal or external hemorrhage
Forensics	Pertains to legal matters and incorporates the science of pathology and death scene analysis to determine a cause of death
Liver mortis (hypostasis)	Process by which blood settles to the dependent portions of the body, causing a deep purple discoloration of the skin; occurs within 2-4 hours and becomes “fixed” within 8-12 hours.

Forensic Autopsy Cadaver Demonstration
Terminology/Vocabulary Reference Guide (Continued)

Manner of death	The fashion in which the cause of death came into being; these are normally classified as Natural, Accident, Homicide, Suicide or Undetermined
Marbling	A characteristic of postmortem decomposition as hemolyzed blood within the superficial veins mixes with hydrogen sulfide and turns a black color; it reveals a weblike pattern of blood vessels in the face, chest, abdomen and extremities
Mechanism of death	The physiological or biochemical derangement produced by the above cause which is incompatible with life (how the disease or injury leads to death)
Medical Examiner (ME)	A physician, licensed to practice medicine, usually trained in pathology, particularly forensic pathology
Odontology	The branch of medicine dealing with the anatomy, development and diseases of the teeth. A forensic odontologist helps to identify unknown corpses by matching dental patterns with previous X-rays, dental casts or photographs. They may also be called upon to match a suspect's teeth with bite marks on a victim or another pertinent object.
Pathology	The scientific study of the nature of disease and its causes, processes, development and consequences. The forensic pathologist is a licensed physician with specialty training in pathology, as well as subspecialty training in forensic pathology. The forensic pathologist is in charge of the body and all evidence that is obtained from its examination.
Putrefaction	The state of body decomposition
Rigor mortis	Muscular rigidity which develops in a cadaver, usually from 4-10 hours after death and lasts 3-4 days
Serology	The branch of science that deals with the measurement and characterization of antibodies, antigens and other immunological substances in bodily fluids (serum). The serologist conducts blood typing, paternity testing and DNA profiling.
Strangulation	Inordinate compression of the neck that leads to unconsciousness or death by causing an increased hypoxic state in the brain
Toxicology	The study of drugs and poisons. The forensic toxicologist can determine whether or not drugs or poisons are present in the living or the deceased in order to determine if those substances contribute to injury or death. Toxicologists also conduct tests to determine alcohol intoxication or drug abuse.

Forensic Autopsy Cadaver Demonstration
Pre/Post Test

1. This is an abnormal condition described as an accumulation of air in the chest cavity:
_____.
2. The _____ of death is described as the disease process or injury responsible for initiating the train of events, brief or prolonged, which produces the fatal end result.
3. _____ is the scientific study of the nature of disease and its causes, processes, development and consequences.
4. Under normal circumstances, the first part of the body to develop rigor is the area around the _____.
5. A bone in the neck that is frequently broken with strangulation is the _____.
6. Name the five "Manners of Death" as they are normally classified:
 - a. _____
 - b. _____
 - c. _____
 - d. _____
 - e. _____
7. Liver mortis, or the lividity that appears postmortem, will usually become "fixed" in how many hours? _____.
8. The longer the postmortem interval, the _____ precise the estimate of time of death.
9. Entomology is the scientific study of _____.
10. There are multiple factors that can affect the rate of cooling of a body postmortem. Name three of these:
 - a. _____
 - b. _____
 - c. _____
11. What type of bag is used to "bag" hands and/or feet at a crime scene?
_____.
12. The autopsy of the body is just one part of the death investigation. Name the other two parts of the so-called "diagnostic triangle":
 - a. _____
 - b. _____

Bonus: Are you interested in a career in medicine, science or healthcare?

**Forensic Autopsy Cadaver Demonstration
Pre/Post Test Answers**

1. pneumothorax
2. cause
3. pathology
4. face and neck
5. hyoid
6. Manners of Death
 - a. Natural
 - b. Accidental
 - c. Homicide
 - d. Suicide
 - e. Undetermined
7. 8-12 hours
8. less
9. insects
10. Factors that impact the rate of cooling
 - a. Ambient temperature
 - b. Clothed vs unclothed
 - c. Weight of deceased
 - d. Exposure of body to wind/breeze
 - e. Temperature of body prior to death
 - f. Exposed surface area
11. paper
12. history and scene