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| **TEXAS CTE LESSON PLAN**[www.txcte.org](http://www.txcte.org) |
| **Lesson Identification and TEKS Addressed** |
| **Career Cluster** | Law, Public Safety, Corrections, & Security |
| **Course Name** | Forensic Science  |
| **Lesson/Unit Title** | Role of Forensic Pathologists and Anthropologists |
| **TEKS Student Expectations** | **130.339. (c) Knowledge and Skills**(5) The student explores the history, legal aspects, and career options within forensic science.(D) The student is expected to identify and illustrate roles, functions, and responsibilities of professionals in the criminal justice system, including crime scene investigators, criminalists, attorneys, and medical examiners(6) The student recognizes the procedures of evidence collection while maintaining the integrity of a crime scene.1. The student is expected to compare and contrast the roles of forensic scientists and crime scene investigators
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| **Basic Direct Teach Lesson**(Includes Special Education Modifications/Accommodations and one English Language Proficiency Standards (ELPS) Strategy) |
| **Instructional Objectives** | The student will be able to:1. Analyze the role of forensic pathologists in investigations.2. Analyze the role of forensic anthropologists in investigations.3. Identify career-related information for forensics pathologists and anthropologists that is relative to making career decisions. |
| **Rationale** | Forensic Anthropology and Forensic Pathology can be essential in criminal investigations, especially in homicides. They play an important role in being able to identify human remains and cause of death. These expert findings can be crucial for an investigation and in the courtroom. |
| **Duration of Lesson** | 4-5 hours |
| **Word Wall/Key Vocabulary***(ELPS c1a,c,f; c2b; c3a,b,d; c4c; c5b) PDAS II(5)* | Refer the direct instructions section below. |
| **Materials/Specialized Equipment Needed** | * Computers with Internet access and/or books for research of careers Paper or cardstock and markers or computers with desktop publishing software
* Forensic Career Sign-up Sheet
* Forensic Career Brochure Handout
* Venn Diagram
* Pathologists and Anthropologists Worksheets
* Pathologists and Anthropologists Worksheets 2
* Presentation Rubric
* Individual Work Rubric
* Discussion Rubric
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| **Anticipatory Set**(May include pre-assessment for prior knowledge) | Give a brief description of the career for a forensic pathologist and forensic anthropologist to the class without giving the actual name of the career. Have students work in pairs to brainstorm as many TV shows that they can think of that have characters playing the description of that career. Have the pairs share their lists. An extension could be to discuss how the careers in these shows relate to the careers in real life. Use the Discussion Rubric for assessment. |
| **Direct Instruction \*** | 1. Forensic Pathologist
	1. Definition (Pathologist versus Forensic Pathologist)
		1. Pathologist – a physician who examines and analyzes tissue samples to identify irregularities and diagnose diseases
		2. Forensic Pathologist – a specialist who determines the cause and manner of death of the deceased
	2. History
		1. The Middle Ages
			1. Autopsies were
				1. Performed to establish cause of death in humans
				2. Well documented
				3. Studied to help doctors discover more about human anatomy
		2. The mid-1800’s
			1. Rudolf Virchow
				1. Was a German physician
				2. Known as the father of modern pathology
				3. Explained how disease arose in the individual cells and its effects on tissues and organ systems
		3. 1955
			1. G.S.W. de Saram
				1. Published detailed measurements of body temperature decrease in executed prisoners
				2. Used these temperatures to establish time of death
	3. Roles and Responsibilities
		1. Usually work for a governing body that assists law enforcement agencies; they are brought in to examine unexpected, sudden, or violent deaths
		2. Primary Role is to determine the cause, mechanism, and manner of death
			1. Cause of Death (COD)
				1. Is the underlying disease, injury, abnormality, or poisoning that results in a person’s dying
				2. Examples of CODs

Gunshot wound, skull fracture, heart attack, arsenic poisoning, etc.* + - * 1. If COD cannot be determined by initial observation, an autopsy is performed

An autopsy is a medical external and internal examination of a body to help determine the COD* + - 1. Mechanism of Death
				1. Is the physiological reason that a person dies
				2. Examples of Mechanisms of Death

A gunshot wound to the chest is the COD, but the mechanism of death is exsanguination (bleeding to death)Drug overdose is the COD, but the mechanism of death could be heart failure* + - 1. Manner of Death
				1. There are five categories into which the manner of death can fall

NaturalAccidentalSuicideHomicideUndetermined* + 1. Other responsibilities
			1. Perform autopsies externally and internally
			2. Collect evidence externally on the body (done by the forensic pathologists and/or the medical examiner’s office)
				1. Examples: clothing, blood, hair, fibers
			3. Issue death certificates
			4. Assist with the identification of the deceased
			5. Establish time and date of death
			6. Possibly notify the next of kin
			7. Act as an expert witness in civil and/or criminal courts
				1. Establish credibility through experience
				2. Explain findings to a jury or court
		2. Other Titles
			1. Usually holds other titles like medical examiner, coroner, or medico-legal death investigator
				1. People who hold these titles are usually appointed to the position of forensic pathologist
				2. The term, “medico-legal,” is used when applying medicine science to law
			2. However, people who hold these titles do not have to be forensic pathologists
		3. Education
			1. After graduating high school
				1. Attend a university
				2. Obtain a bachelor’s degree

Complete all of the required prerequisites for medical schoolThe major a person chooses does not matter* + - 1. After receiving a bachelor’s degree
				1. Attend a 4-year medical school
				2. Obtain a medical degree (MD) or Doctor of Osteopathic Medicine (DO) degree
			2. After completing medical school
				1. Complete a 5-year residency/training in clinical and/or anatomic pathology and forensic pathology
			3. This is not a career that can be entered lightheartedly because it takes 13 years of education to prepare for
		1. Certifications and Licenses
			1. Get a license to practice medicine
			2. Become board certified
				1. Need to pass an exam given by the American Board of Pathology
				2. In some places this is not required but is highly recommended
		2. Other Requirements
			1. Have a keen eye for detail
			2. Work well under pressure
			3. Be able to accept that they hold a great deal of responsibility
			4. Communicate well with others
			5. Be able to keep calm and patient
			6. Be thorough in every investigation and confident in their findings
		3. Where they work
			1. State governments
			2. City or county governments
			3. Colleges, universities, or medical schools
			4. The military
			5. The federal government
			6. Private groups or practices
			7. Hospitals
		4. Salary and Benefits
			1. Annual salary anywhere between $151,000–$308,000 (in the year 2012)
			2. Benefits usually include the following
				1. Paid vacation
				2. Health, disability, and life insurance
				3. Retirement or pension plans
			3. Usually work a 40-hour week, but can be called in at any time if there is a death emergency
		5. Outlook for career
			1. Growing faster than average
			2. With the population increasing, that means more deaths which leads to needing more forensic pathologists to determine the cause and manner of death
1. Forensic Anthropology
	1. Definition (Anthropologist versus Forensic Anthropologist)
		1. Anthropologist – a person who holds at least a master’s degree and studies humanity. They study humans’ physical, social, and language development, and the cultures that they establish
		2. Forensic Anthropologist – an anthropologist who examines the skeletal or decomposed remains in unexplained deaths
	2. History
		1. 1878
			1. Thomas Dwight
				1. Known as the Father of Forensic Anthropology
				2. Published an essay that uses parts of skeletal remains that can establish age, sex, or height
		2. 1939
			1. W.M. Krogman
				1. Published the book The Human Skeleton in Forensic Medicine
				2. Although the term forensic anthropology is not used in the textbook it is used as a guide for many years
		3. 1957
			1. Thomas Mocker and T. Dale Stewart
				1. Identified the growth stages of skeletal bones
				2. Formed the basis of forensic anthropology
		4. 1971
			1. Dr. William Bass starts the first “Body Farm” at the University of Tennessee
	3. Roles and Responsibilities
		1. Most work at universities or museums and are brought in on cases where they will help to identify a body or possible cause of death
		2. Primary Role
			1. Identifying someone from the body’s skeletal, decomposed, or charred remains
			2. The skeletal remains can tell an anthropologist a large amount of information to help aid in his or her process. The following are examples
				1. If the remains are human or not
				2. Age (by bone development)
				3. Sex (by bone weight and size)
				4. Height (length of bones)
				5. Race (nose and eye socket structures)
				6. Any possible skeletal injuries
		3. Other responsibilities
			1. May assist pathologists with autopsies to help establish cause of death
			2. Some may perform facial reconstruction of a skull to attempt to recreate what a person’s face may have looked like
			3. Help search areas for human remains and recover those remains
			4. Called in to help during mass disasters to identify victims, for example
				1. A plane crash
				2. Natural disasters
				3. Terrorist attacks
			5. Act as an expert witness in civil and/or criminal courts
				1. Establish credibility through experience
				2. Explain findings to a jury or a court
	4. Career Information
		1. Education
			1. After receiving a high school diploma
				1. Obtain a bachelor’s degree in anthropology, anatomy, or osteology
				2. Osteology is the scientific study of bones
			2. Complete graduate work in anthropology or forensic anthropology
				1. It is important to pick a graduate program where you would like to work
				2. Because most graduates in this field of study receive their first job at their university
			3. Complete a doctorate (optional)
				1. Needed to join the faculty at a college or university
				2. Most places may hire people with a master’s degree on a temporary basis, but they usually need to be working on their doctorate
		2. Certificates and Licenses
			1. Complete certification through the American Board of Forensic Anthropology
				1. Have a PhD
				2. Show experience in the field of study
				3. Pass a practical exam and a written exam
		3. Other requirements
			1. Work well with a team (may be working with pathologists, odontologists, and investigators)
			2. Have a desire for knowledge due to continued research in the field
			3. Communicate well with others
			4. Have good writing skills
			5. Be able to train and teach others
		4. Where they work
			1. Colleges or universities (most of them work here and are brought in on cases)
			2. Research institutions
			3. Medical examiner’s offices
			4. Law enforcement agencies
			5. Military
			6. Most are employed as independent consultants that are brought on during certain cases
		5. Salary and Benefits
			1. The U.S. Department of Labor does not provide salary information for Forensic Anthropologists since they usually work at colleges and universities and are independent consultants for cases
				1. Anthropologists at colleges and universities make anywhere between $32,000–117,000 depending on the institution (in the year 2012)
				2. Forensic Anthropologists typically earn $100–200 an hour as consultants
			2. Benefits usually include
				1. Vacation and sick time
				2. Health and life insurance
				3. Pension or 401K plans
		6. Outlook for career
			1. Growing more slowly than average
				1. Because the forensic anthropology field is so small and the turnover is low
				2. The number of applicants is larger than the number of positions available
2. Forensic Pathologist versus Forensic Anthropologists
	1. Differences between the two
		1. Concentration
			1. Forensic pathologists mostly focus on fleshed bodies and collect information from the soft tissue
			2. Forensic anthropologists mostly focus on the skeletal remains and the hard tissue
		2. Primary concerns
			1. A forensic pathologist’s primary concern is the cause and manner of death of the victim
			2. A forensic anthropologist’s primary concern is the identity of the victim
		3. Legal Authority
			1. Forensic pathologists
				1. Have the authority to perform autopsies and state the cause and manner of death
				2. Issue death certificates
			2. Forensic anthropologists
				1. Analyze skeletal remains
				2. Present their opinion but not a legal statement
	2. Similarities between the two
		1. These careers overlap since decomposition is a continuous process
			1. A pathologist is helpful when mummified tissues exist
			2. An anthropologist is helpful when decomposition is more advanced
		2. Both careers work to
			1. Determine time since death
			2. Look for any evidence on the deceased
			3. Collect said evidence
	3. Working together
		1. At times, forensic pathologists and forensic anthropologists work together on cases with the investigators assigned
		2. Both are a part of the medico-legal system when needed for certain types of cases such as
			1. Non-natural deaths
			2. Sudden deaths, not in a doctor’s care, of people under the age of 50
			3. Deaths in prisons or other state-run institutions
			4. Deaths of children that are less than 1 year old
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| **Guided Practice \*** |  |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Create a career brochure. Have students sign up for a Forensic Science related career on the Forensic Career Sign-up Sheet and then create a brochure about that career using the Forensic Career Brochure Checklist. The brochures should be similar to one that may be found at a job fair which outlines the basics known for the career. Have students present their career and brochure to the class. Use the Forensic Career Brochure Checklist and the Presentation Rubric for assessment. |
| **Lesson Closure** |  |
| **Summative/End of Lesson Assessment \***  | * Role of Forensic Pathologists and Anthropologists Quiz and Key
* Forensic Career Brochure Checklist
* Discussion Rubric
* Individual Work Rubric
* Presentation Rubric
* Summary Rubric

**Accommodations for Learning Differences:** For reinforcement, students will create a Venn diagram comparing the roles of pathologists and anthropologists. Use the blank Venn Diagram for the activity and the Individual Work Rubric for assessment. |
| **References/Resources/****Teacher Preparation** | * Saferstein, Richard. *Criminalistics: An Introduction to Forensic Science*. Upper Saddle River, NJ: Prentice Hall, 2004.
* Deslich, Barbara, and John Funkhouser. *Forensic Science for High School*. Dubuque, IA: Kendall/Hunt, 2006.
* *Careers in Focus.* New York: Ferguson, 2010.
* [http://thename.org](http://thename.org/)
* [http://www.theabfa.org](http://www.theabfa.org/)
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| **Additional Required Components** |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** | English/Language Arts Standards1. Speaking

B. Develop effective speaking styles for both group and one-on-one situations.* + 1. Participate actively and effectively in one-on-one oral communication situations.
		2. Participate actively and effectively in group discussions.
		3. Plan and deliver focused and coherent presentations that convey clear and distinct perspectives and demonstrate solid reasoning.
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| **Recommended Strategies** |
| **Reading Strategies** |  |
| **Quotes** |  |
| **Multimedia/Visual Strategy****Presentation Slides + One Additional Technology Connection** |  |
| **Graphic Organizers/Handout** |  |
| **Writing Strategies****Journal Entries + 1 Additional Writing Strategy** |  |
| **Communication****90 Second Speech Topics** |  |
| **Other Essential Lesson Components** |
| **Enrichment Activity**(e.g., homework assignment) | For enrichment, students will interview a Forensic Pathologist or Anthropologist to learn more about their careers and roles. The students will summarize the experience in a brief paper. Use the Summary Rubric for assessment. |
| **Family/Community Connection** |  |
| **CTSO connection(s)** | SkillsUSA |
| **Service Learning Projects** |  |
| **Lesson Notes** |  |

1. Visit the Texas College and Career Readiness Standards at <http://www.thecb.state.tx.us/collegereadiness/CRS.pdf>, Texas Higher Education Coordinating Board (THECB), 2009. [↑](#footnote-ref-1)