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| **Title** | **Forensic Science…Observation** |
| **Introduction** | With so many crime shows on television, students are interested in crime scene investigation. This lesson is designed to provide students the opportunity to become familiar with the process of observation, eyewitness accounts, and the Innocence Project. Students will explore career opportunities available in this field. |

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| **Curriculum Alignment** | **National Healthcare Foundation Standards**  Foundation Standard 2: Communications   * 1. Recognize barriers to communication.   2. Report subjective and objective information.   3. Apply speaking and active listening skills   Foundation Standard 3: Systems   * 1. Explain the impact of emerging issues in health care such as technology, epidemiology, bioethics, and socioeconomics on healthcare delivery systems.   Foundation Standard 5: Legal Responsibilities   * 1. Analyze legal responsibilities   2. Apply procedures for accurate documentation and record keeping.   Foundation Standard 6: Ethics  6.32 Demonstrate respectful and empathetic treatment of all patients/clients  Foundation Standard 8: Teamwork  8.11 Understand roles and responsibilities of team members. |
| **Learning Outcomes** | By the end of these lessons, the learner will be able to…Define observation and describe the changes that occur in the brain.Describe examples of factors influencing witness accounts of crimes.Compare the reliability of eyewitness testimony to what actually happened.Relate observation skills to their use in forensic science.Define forensic science.Practice and improve observation skills. |
| **Time Required and Location** | This lesson is designed to cover four class periods in a 90 minute block schedule. However, this may be shortened by eliminating one or more of the post-lesson activities. |

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| **Materials Needed** | Materials needed  * Power Point Presentation *Intro to Observation PowerPoint*(Attached) * Research Information Sheets for:   + *Forensic Psychologist (Activity sheet and grading rubric)*   + *Forensic Investigator (Activity sheet and grading rubric)*   + *Innocence Project (Activity sheet and grading rubric)*   + *Differentiated Learning Assignment (Key attached)*   + *Terminology Matching Activity (Key attached)*   (Word Documents Attached for the above)  **Technology resources**   * Power Point software * LCD projector * Student computers with Internet access |
| **Safety** | There are no specific safety considerations for these activities. |
| **Participant Prior Knowledge** | This lesson does not have any prerequisites or concepts and topics that should have been taught prior to teaching this course.  To stimulate student interest, you may ask students to watch one of the many popular crime series on television. Of particular interest would be episodes of *CSI –* (The original as well as ***CSI New York*** or ***CSI Miami***) as well as ***Bones*** (the story of a forensic anthropologist and an FBI agent who investigate crimes) and ***Dr. G – Medical Examiner*** (a reality show featuring the work of a forensic pathologist who is a medical examiner in Florida.). |
| **Facilitator Preparations** |  |
| **Activities** | The lessons will be divided as follows. **1. Observation**   1. Forensic investigators must have the ability to observe, interpret and report observations.    * 1. Definitions      2. The five senses 2. Humans obtain information through observations using sight, hearing, smell, taste and touch.    * 1. Brain filtering 3. Filtering is an unconscious process that helps the brain deal with incoming stimuli and avoid becoming overwhelmed.    * 1. Filling in gaps with prior knowledge   **2. Practicing good observation skills**   1. Basic tips for observation   **3. Witness and eyewitness accounts**   1. Many things influence a witness and impact their memory of a situation.    * 1. Perception      2. Factors affecting observational skills      3. The Innocence Project 2. Studies conducted by the Innocence Project have found that faulty eyewitness identifications have contributed to up to 75% of wrongful convictions.    * 1. Actual number of wrongful convictions are very low (approximately 0.5%)      2. Fact versus opinion   **4. Observation in forensic science**   1. A forensic investigator finds, examines and evaluates evidence using technology and good observation skills.    * 1. Define forensics      2. Analytical skills      3. Deductive reasoning 2. Careers in forensic science    * 1. Forensic psychologist      2. Forensic investigator |
| **Assessment** | Informal AssessmentTeacher asks: *When an investigator is using forensic science in criminal justice, what is the focus of the investigation?*Response: Possible discussion would address the importance of learning the facts and the truth. Discuss how facts would be more reliable than circumstantial evidence or the statement of witnesses. Discuss how witness testimony may frequently be flawed.Teacher asks: *What college degree program would most likely require students to take a course in forensic science?* Response: The most correct answer would be a criminal justice program. However students taking courses in all areas of science may be interested in forensic science as it relates to their particular area of interest.Teacher asks: *Name some science areas related to forensic sciences.*Response: There are many correct answers to this question including chemistry, biology, geology, physics, microbiology, botany, psychology, sociology, anatomy, anthropology, meteorology, genetics and others that students may think of.Teacher asks: *What does the term “forensic” mean?* Response: Forensic is a Latin term that means *public discussion or debate.* This may clear up some misconceptions students have regarding the course or club - also called Forensics - that features public speaking, debates and discussions. In terms of criminal investigation, forensic refers to the branch of science used in the criminal justice system to answer questions regarding legal matters. Since people may be charged with a crime that has serious consequences, it is important to allow them to debate their innocence in a court of law with a jury of their peers.Teacher asks: How does observation work?Response: We gather information using our senses – vision, hearing, touch, smell and taste. It is done without much thought and is necessary to our survival. But the constant flow of information causes our brain to “filter out” information that it does not deem critical. The brain then fills in information based on prior knowledge. (For example, your eyes see brown ice cream and your brain believes it is chocolate.)Teacher asks: *How can we improve our observation skills?* Response: Four steps are (1) Make a conscious effort to examine the environment. (2) Be aware the brain filters out some information. (3) Avoid making interpretations and (4) Document everything!Teacher asks: *What is the difference between subjective information and objective information?*Response: Subjective information is based on opinion or personal feelings. It cannot be measured or verified by another person. (Example: “My favorite color is blue.”) Objective information can be measured or verified by another person. (Example: “I am five feet tall.”) In terms of forensic investigation, subjective information would be considered opinion and objective information would be considered fact.Teacher asks: *Why are eyewitness accounts sometimes inaccurate?*Response: We already know the brain filters information or replaces information with prior knowledge. In addition, other factors may influence the way a person observes a situation. During the commission of a crime, the event may occur quickly, the person committing the crime is unknown to the witness and the witness is under stress.Teacher asks: *If eyewitness accounts can be flawed, are there many people in jail who were falsely accused of crimes?* Response: Ten years of research by three scientists determined that about 0.5 percent of persons convicted of felonies are actually innocent of the crimes of which they were convicted.Teacher asks: *What resources are available for someone who was falsely convicted?*Response: The Innocence Project was started in 1992 with a goal of exonerating wrongfully convicted persons through DNA testing.Teacher asks: *Of those exonerated, how many were wrongfully convicted based on eyewitness misidentification?* Response: The Innocence Project estimates eyewitness misidentification played a role in 75% of the convictions overturned through DNA testing.Teacher asks: *Name some skills necessary for a forensic investigator to be a good observer.*Response: Analytical skills, deductive reasoning, practiced observational skills and the ability to document accurately and completely. |

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| **Critical Vocabulary** | **Analytical skills:** The ability to identify a concept or problem, isolate its component parts, organize information for decision making, establish criteria for evaluation, and draw appropriate conclusions.  **Deductive reasoning:** Deriving consequences from facts using a series of logical steps.  **Eyewitness:** A person who has seen someone or something and can communicate these facts.  **Fact:** A statement or assertion of information that can be verified.  **Forensic:** For public discussion or debate. The application of scientific knowledge to legal questions.  **Logical**: Conclusions drawn from assumptions and known facts.  **Objective:** Based on facts rather than opinion.  **Observation:** What a person perceives using their senses.  **Opinion:** Personal belief founded on judgment rather than on direct experience or knowledge.  **Perception:** Interpreting information received from the senses.  **Subjective:** Based on opinion or personal feelings. |
| **Community Engagement** |  |
| **Extension Activities** | Students may research one of the following cases to discover the role forensic science and crime scene analysis played in the arrest and/or conviction of the accused.  1. Larry Gene Ashbrook and Wedgewood Baptist Church – Ft. Worth, Texas 2. Hyo Jung Jin, suitcase body, Yorkshire England 2001 3. O.J. Simpson charged with murder of Nicole Brown Simpson & Ronald Goldman 4. Richard Crafts and Helle Crafts (Body identification) |

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| **Modifications** | Because much of the work in this unit is done in teams or small groups, it is possible to group students who are stronger academically with students who may require additional assistance.  For students who need additional assistance, use Assignment Option One, which requires less research and less time to complete. It may also be necessary to research a specific career and print information on the career prior to the lesson to allow a student more time to work on the assignment.  For students who may need to be challenged beyond the assignments, use the *Differentiated Learning* assignment. (Word Document and grading key attached.) |
| **Supplemental Information** | **American Academy of Forensic Sciences** (Provides information on forensic techniques, educational requirements and references to other sites.) ([www.aafs.org](http://www.aafs.org))  **Careers in Forensic Medicine** (Provides information on careers in forensic medicine, suggested pre-requisites for high school students, educational programs for meeting career requirements and salary information.) ([www.explorehealthcareers.org](http://www.explorehealthcareers.org)  **Forensic psychology and forensic profiling** (Describes the use of psychology and profiling to identify suspects in a crime.) ([www.all-about-forensic-psychology.com](http://www.all-about-forensic-psychology.com))  United States Department of Labor; Bureau of Labor Statistics  <http://www.bls.gov>  Braun, K.A., Ellis, R.E. & Loftus, E.F. Make my memory: How advertising can change our memories of the past. *Psychol*. *Mark*. **19**. 1-23 (2002)  Loftus, E.F. Memory faults and fixes. *Issues Sci. Technol*. **18**. 41-50 (2002)  Loftus, Elizabeth, Our changeable memories: legal and practical implications. *Nature Reviews/Neuroscience.* **4**. 231-234 (2003)  Kavassalis, C. (2000, December). “The role of observation in the history and philosophy of science”. Online publication: <http://www.softwareimpact.com/cathy/Observation1.htm>  Kanable, Rebecca. “Honest lies? The impact of memory on criminal investigations.” *Law Enforcement Technology* 33.3 (2006): 30+. *Forensic Science Journals.* Web. 25 May 2006.  Cromett, Michael F. J.D. and Myster, Susan M. Thurston, PhD. The work of an Innocence Project. *Forensic Magazine* (<http://www.forensicmag.com>) 01/10/2005  Gross, Samuel R. and O’Brien, Barbara. Frequency and Predictors of False Conviction: Why we know so little, and new data on capital cases. *Journal of Empirical Legal Studies.* Volume 5, Issue 4, 927-962, December 2008  Huff, C.R., Ratner, A., and Sagarin, E. (1996). *Convicted but Innocent: Wrongful conviction and public policy.* Thousand Oaks, CA: Sage Publications.  Saferstein, Richard (2007), *Criminalistics: An Introduction to Forensic Science* 9th Edition. Pearson Prentice Hall, Upper Saddle River, NJ |
| **Comments** | With the popularity of crime scene programs on television, this unit of study is one that students often enjoy. They find the subject matter interesting and it shows them the importance of science and attention to detail. |
| **Author Info** | ***Jennifer C. Jones – Kenan Fellow***   * Registered nurse with experience in emergency medicine, pediatrics and psychiatric crisis intervention. * Teacher of Health Science Education at Pine Forest High School in Fayetteville North Carolina (Cumberland County Schools System) * Currently teaching Health Team Relations (grade 9); Biomedical Technology (grade 10); Health Science II (grade 12) and Nursing Fundamentals (grade 12) * 13 years classroom experience; 23 years nursing experience * Bachelor of Science in Nursing (Excelsior College); Master of Arts in Education (East Carolina University); National Board Certified Teacher (Career and Technical Education)   This lesson was developed to help capture the interest of my students. I want them to see “real world” connections to the topics that entertain them on television. It is my goal to help students see education – particularly science education – as a way to improve the quality of their lives, provide an interesting and rewarding career opportunity, and improve the lives of others.  ***David Pauly – Kenan Mentor***  My mentor for the Kenan Fellows Project is Dave Pauly. Mr. Pauly retired from the U.S. Army Criminal Investigation Command as a Special Agent-in-Charge/Commander and Forensic Science Officer. He performed law-enforcement duties in over a dozen states, frequently working with local, state, and other federal agencies. Outside the United States he performed duties in Panama, South Korea, Afghanistan, Haiti, Kuwait, Saudi Arabia, Israel, Turkey, Sinai, Egypt, Canada, Guam and Nigeria.  A graduate of the FBI National Academy (Session 195), Dave also completed advanced studies, such as the Canadian Police College Major Crimes Course, Miami-Dade Police Department Bloodstain Interpretation Course, and National Fire Academy Arson Investigation Course. As an expert, Dave frequently lectures and consults on forensic science topics around the country and at Sirchie Fingerprint Labs. He is a member or affiliate of the American Academy of Forensic Science, IAI, North Carolina Chapters of the IAI and FBINAA, IABPA, ASIS, EPIC, and Vidocq Society. He holds a Master of Forensic Science degree from The George Washington University and is currently the Director of Applied Forensic Science at Methodist University in Fayetteville, NC. |