

<b>Grade &amp; Course:</b> 11th/12th Forensic Science	<b>Topic:</b> Unit 8 Toxicology	<b>Duration:</b> 3 weeks
<b>Teachers:</b> Forensic PLC Teachers		
<b>Georgia Standards and Content:</b> SFS3. Obtain, evaluate, and communicate information relating to biological evidence in forensic investigations. a. Ask questions to investigate types of toxins, poisons, and drugs and their effects on the body. b. Analyze and interpret data to investigate the effects of blood alcohol content on the body.		
<b>Narrative / Background Information</b>		
<b>Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT)</b> At this point in the curriculum students know how to collect evidence found at a crime scene and what chromatography and spectrometry are. They have knowledge of processing hair, fiber, soil, glass, fingerprints & footwear, tool marks, and biological evidence such as blood and DNA.		
<b>Year-Long Anchoring Phenomena: (LEARNING PROCESS)</b> An unidentified body was found in the back seat of a wrecked vehicle where the driver had fled the scene and the passenger was injured.		
<b>Unit Phenomena (LEARNING PROCESS)</b> Cory Monteith, a star from <i>Glee</i> , was found dead of a drug overdose in 2013. Death was classified as a suicide, even though Cory was very happy in life.		
<b>Inquiry Statement:</b> Investigators rely on forensic toxicologists to make reliable conclusions about the impact a specific amount of substance would have on a specific individual.		
<b>Global Context:</b> Scientific and Technical Innovation		
<b>Science &amp; Engineering Practices:</b> <ul style="list-style-type: none"> <li>Asking Questions</li> <li>Carrying out investigations</li> <li>Analyze and Interpret Data</li> </ul>	<b>Disciplinary Core Ideas: (KNOWLEDGE &amp; SKILLS)</b> <ul style="list-style-type: none"> <li>History of Forensic toxicology</li> <li>Characteristics of Poisons, Toxins, and Drugs</li> <li>Collecting toxicological evidence</li> <li>Forensic analysis of poisons , toxins, and drugs</li> </ul>	<b>Crosscutting Concepts: (KNOWLEDGE &amp; SKILLS)</b> <ul style="list-style-type: none"> <li>Cause and Effect</li> </ul> <hr/> <b>Key and Related Concepts:</b> <ul style="list-style-type: none"> <li>Change</li> <li>Consequences</li> </ul>
<b>Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)</b> Misconception- Controlled substances are not dangerous Preconception- Most overdoses are credited to opioids. <b>Key Vocabulary: (KNOWLEDGE &amp; SKILLS)</b> <ul style="list-style-type: none"> <li>Acute Poisoning</li> <li>Addiction</li> <li>chronic poisoning</li> <li>controlled substance</li> <li>Controlled Substances Act</li> <li>dependency</li> <li>depressant</li> <li>First Step Act</li> <li>hallucinogen</li> <li>illegal (illicit) drug</li> </ul>		

- metabolite
- narcotic
- neurotransmitter
- poison
- blood alcohol content (BAC)
- stimulant
- tolerance
- toxicity
- toxicologist
- toxicology
- toxin
- withdrawal

#### **Inquiry Questions:**

Factual -

- What are over-the-counter drugs?
- What are illegal drugs?
- What are heavy metals?
- What are the five categories of controlled/illegal drugs?
- What do toxicologists test for in urine?

Conceptual –

- How can over the counter drugs be dangerous?
- What effect do drugs have on the body?
- How do we test for over-the-counter drugs?
- How do we test for illegal drugs?
- What effects do heavy metals have on the body?
- How do we test for heavy metals?
- How does a breathalyzer test different from a blood test when testing for blood alcohol levels?
- What effect does alcohol have on the body?

Debatable -

- Should over-the-counter drugs require more documentation to purchase? Why or why not?

### **Summative assessments**

#### **Unit Objectives:**

<b>Learning Activities and Experiences</b>	<b>Inquiry &amp; Obtain: (LEARNING PROCESS)</b>	<b>Evaluate: (LEARNING PROCESS)</b>	<b>Communicate: (LEARNING PROCESS)</b>
<b>Week 1:</b>	<ul style="list-style-type: none"> <li>• <b>Phenomenon: Cory Monteith, a star from <i>Glee</i>, was found dead of a drug overdose in 2013. Death was classified as a suicide, even though Cory was very happy in life.</b></li> <li>• <i>Drug Analysis Unit Overview</i> <ul style="list-style-type: none"> <li>• <i>Over the counter drugs</i></li> <li>• <i>illegal drugs</i></li> <li>• <i>heavy metals</i></li> <li>• <i>urinalysis</i></li> </ul> </li> </ul>	<p>Day 2 Notes: Illegal Drugs</p> <p>Lab 2: Identification of Illegal Drugs &amp; Optional Urinalysis</p> <p>(Optional Urinalysis portion of this lab taken from end of chapter activities in Bertino textbook, 2nd edition.)</p>	<p>Day 3- Debate: Should over-the-counter drugs require more documentation to purchase? Provide evidence for your reasoning.</p>

	<ul style="list-style-type: none"><li>• <i>blood alcohol</i> (Separate out types of drugs, characteristics, effects on body, and forensic testing with lab for each. At end of unit have review and unit test.)</li></ul> <p>Day 1: Over the counter drugs Notes Lab 1: Identification of Over-the-Counter Drugs</p> <p>(Note: Labs 1, 2, &amp; 3 use the Forensic Drug and Poison Analysis: Chemistry and Toxicology Kit from Aldon Corporation. Catalog # IS9016)</p>		
Week 2:	<p>Day 4 Notes: Heavy Metals (Use poisoner’s handbook activity, revised to include lead and mercury poisoning)</p> <p>Lab 3: Identification of Heavy Metals (2 lab activities- includes Urinalysis)</p>	Day 5: Blood Alcohol Content Simulation Activity (with Tutorial)	
Week 3:	Day 6: Review & Closer Lab Quiz		
<b>Resources (hyperlink to model lessons and/or resources):</b> <ul style="list-style-type: none"><li>• Textbook Forensic Science Bertino &amp; Bertino, 3rd Edition</li><li>• Forensic Science Schoology Course</li><li>• Additional resources can be found in the common Schoology group under the Unit 8 folder.</li></ul>			
<b>Reflection: Considering the planning, process and impact of the inquiry</b>			
Prior to teaching the unit	During teaching	After teaching the unit	