

Wilson Area School District Planned Course Guide

Title of Planned Course: Forensic Science

Subject Area: Science

Grade Level: 12 and transfer students

Course Description: This course surveys key topics in forensic science, including the application of the scientific process to forensic analysis, procedures, and principles of crime scene investigation, physical and trace evidence, and the law and courtroom procedures from the perspective of the forensic scientist. Through online lessons, virtual and hands-on labs, and analysis of fictional crime scenarios, students learn about forensic tools, technical resources, forming and testing hypotheses, proper data collection, and reliable conclusions.

Time/Credit for this Course: 1 semester; 0.5 credit

Curriculum Writing Committee: Isaac Ruhf

Curriculum Map

<u>August / January:</u>	History of Forensic Science
<u>September / February:</u>	Scientific Principles of Crime Scene Investigation
<u>October / March:</u>	Physical Evidence
<u>November / April:</u>	Biological Evidence
<u>December / May:</u>	Chemical Evidence
<u>January / June:</u>	Forensics in the Legal System

Wilson Area School District Planned Course Materials

Course Title: Forensic Science

Teacher Resources:

- <https://www.fbi.gov/services/laboratory/forensic-response>
- <https://www.fbi.gov/services/laboratory>
- <https://www.psp.pa.gov/contact/Pages/Bureau-of-Forensic-Services.aspx>
- <https://www.phillypolice.com/units/forensics/index.html>
- <https://www.justice.gov/olp/forensic-science>
- <https://www.nist.gov/forensic-science>
- <https://www.crime-scene-investigator.net/csi-resources.html>
- <http://www.istl.org/03-spring/internet.html>

Curriculum Scope & Sequence

Planned Course: Forensic Science

Unit: History of Forensic Science

Time frame: 2 weeks

State Standards: 3.5.9-12.F, 3.5.9-12.KK, 3.5.9-12.II, 3.5.9-12.HH.

Essential content/objectives: At the end of the unit, students will be able to:

- Discuss the origins of forensic science
- Describe the changes that have occurred since the beginning of forensic science
- Distinguish what investigation techniques have been discredited and which remain valid today

Core Activities: Students will complete/participate in the following:

- Fact or Fiction: Distinguishing current vs. discredited methods
- Deep Dive: Research paper on an aspect of forensic science from history
- Sherlock Holmes: Becoming the greatest detective
- Create a timeline of Forensic Science

Extensions:

- Investigate how the development of forensic science has influenced pop culture
- An in-depth investigation into Investigative Careers in Forensic Science

Remediation: Teacher-directed, based on teacher formative assessment

Instructional Methods:

- Student research/presentations
- Direct instruction
- Cooperative learning structures
- Guided practice
- Videos

Materials & Resources:

- Virtual labs
- PowerPoint presentations/ notes

Assessments:

- Individual participation/consultation
- Test, Quizzes
- Project-based assessments
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Planned Course: Forensic Science

Unit: Scientific Principles of Crime Investigation

Time frame: 2 weeks

State Standards: 3.5.9-12.F, 3.5.9-12.KK, 3.5.9-12.II, 3.5.9-12.HH.

Essential content/objectives: At the end of the unit, students will be able to:

- Summarize and organize the steps of the forensic process
- Explain how the scientific method applies to solving crimes
- Appraise what evidence a crime scene offers

Core Activities: Students will complete/participate in the following:

- Bill Nye, The Not So Science Guy: Students will use the scientific method to develop a hypothesis and then create an experiment to test their hypothesis. They will then film a science show showing their investigation and findings.
- Taking the first step: students will examine a variety of popular CSI shows and how they show people entering a crime scene to see if there are any real examples
- Layers of the cake: an investigation of the order in which evidence should be collected
- I Spy: Students will search the classroom to discover hidden items

Extensions: An in-depth investigation into the realism of crime scene investigation shows

Remediation: Teacher-directed, based on teacher formative assessment

Instructional Methods:

- Student research/presentations
- Direct instruction
- PowerPoint presentations/ notes
- Cooperative learning structures
- Guided practice
- Videos
- Labs

Materials & Resources: Virtual labs

Assessments:

- Individual participation/consultation
- Test, Quizzes
- Project-based assessments
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Planned Course: Forensic Science

Unit: Physical Evidence

Time frame: 4-5 weeks

State Standards: 3.2.9-12.I, 3.2.9-12.L

Anchor(s) or adopted anchor: S11.C.3.1; S11.A.1.3.2, 3; S11.A.2.2.1

Essential content/objectives: At the end of the unit, students will be able to:

- Identify the common types of physical evidence
- Analyze what information can be learned from every kind of physical evidence
- Extrapolate theories on how a crime was committed based on physical evidence.

Core Activities: Students will complete/participate in the following:

- Breaking News: An investigation into how glass breaks.
- I can't put a finger on it: How to collect and analyze fingerprints
- Splat!: Examining how blood and other liquids splatter and what that reveals
- Robin Hood: Targeting the impact of projectile motion

Extensions:

- An in-depth investigation into the physics involved in crime scene investigation
- Looking into Careers for Physics Majors in Forensic Science

Remediation: Teacher-directed, based on teacher formative assessment

Instructional Methods:

- Student research/presentations
- Direct instruction
- PowerPoint presentations/ notes
- Cooperative learning structures
- Guided practice
- Videos
- Labs

Materials & Resources: Virtual labs

Assessments:

- Individual participation/consultation
- Test, Quizzes
- Project-based assessments
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Planned Course: Forensic Science

Unit: Biological Evidence

Time frame: 4-5 weeks

State Standards: 3.1.9-12.P, 3.1.9-12.R

Essential content/objectives: At the end of the unit, students will be able to:

- Identify what types of evidence are considered Biological evidence
- Explain the methods crime scene investigators use to collect the different kinds of biological evidence
- Describe how each type of biological evidence is tested
- Analyze the results of laboratory tests on biological evidence and determine their impact on a case

Core Activities: Students will complete/participate in the following:

- Bob the Builder: Students will conduct an online investigation into how DNA is formed and how that makes it a unique identifier for criminal investigations
- What smells?: A look at the bodily fluids that might be present at a crime scene

Extensions:

- How has our gradually developing knowledge of biology influenced crime scene investigation and trials over the years, and how will it continue to impact them in the future?
- Looking into Careers for Biology Majors in Forensic Science

Remediation: Teacher-directed, based on teacher formative assessment

Instructional Methods:

- Student research/presentations
- Direct instruction
- PowerPoint presentations/ notes
- Cooperative learning structures
- Guided practice
- Videos
- Labs

Materials & Resources: Virtual labs

Assessments:

- Individual participation/consultation
- Test, Quizzes
- Project-based assessments
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Planned Course: Forensic Science

Unit: Chemical Evidence

Time frame: 4-5 weeks

State Standards: 3.2.9-12.E, 3.2.9-12.A, 3.2.9-12.N

Essential content/objectives: At the end of the unit, students will be able to:

- Identify what types of evidence are considered chemical evidence
- Explain the methods crime scene investigators use to collect the different kinds of chemical evidence
- Describe how each type of chemical evidence is tested
- Analyze the chemical processes depicted in popular CSI TV shows to identify what is accurate and what is incorrect in their portrayal

Core Activities: Students will complete/participate in the following:

- Ignite the fire within: Students will examine how accelerants affect arson investigations
- Double, double toil and trouble; Fire burn and cauldron bubble: an examination of the use of poison throughout the years
- How cold is it? An examination of how thermodynamics affects all evidence types
- Mr. Clean: A look at the clean-up process after a crime occurs

Extensions:

- Looking into Careers for Chemistry Majors in Forensic Science
- How has our slowly developing knowledge of chemistry changed crime scene investigation and trials over the years, and how will it change it in the future?

Remediation: Teacher-directed, based on teacher formative assessment

Instructional Methods:

- Student research/presentations
- Direct instruction
- PowerPoint presentations/ notes
- Cooperative learning structures
- Guided practice
- Videos
- Labs

Materials & Resources: Virtual labs

Assessments:

- Individual participation/consultation
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- Project-based assessments
- Other individualized assessment strategies as necessary

Curriculum Scope & Sequence

Planned Course: Forensic Science

Unit: Forensics in the Legal System

Time frame: 3 weeks

State Standards: 3.5.9-12.MM, 3.5.9-12.NN

Essential content/objectives: At the end of the unit, students will be able to:

- Examine chains of evidence and determine if the evidence is admissible
- Explain how the prosecution and defense will use evidence to prove a case
- Evaluate the evidence in real-life cases and assess whether the jury returned the correct verdict

Core Activities: Students will complete/participate in the following:

- Order in the Court: Students will study how evidence is submitted into a trial
- Dismissed: This activity examines the legal standards for getting evidence thrown out in court
- Breaking chains: This guided inquiry-based activity will help students take an in-depth look at the chain of custody. Then the students will develop a chain of custody for an item for 24 hours. After 24 hours, the students will evaluate whether the chain of custody they maintained would stand up in court.

Extensions:

- How can we reform the legal system to increase the number of criminals caught and reduce the likelihood of innocent people being wrongly convicted?
- Looking into Legal Careers in Forensic Science

Remediation: Teacher-directed, based on teacher formative assessment

Instructional Methods:

- Student research/presentations
- Direct instruction
- PowerPoint presentations/ notes
- Cooperative learning structures
- Guided practice
- Videos
- Labs

Materials & Resources: Virtual labs

Assessments:

- Individual participation/consultation
- Test, Quizzes
- Project-based assessments
- Other individualized assessment strategies as necessary