CARLSTADT-EAST RUTHERFORD REGIONAL HIGH SCHOOL DISTRICT
SCIENCE DEPARTMENT
FORENSICS

Forensics Curriculum Guide

Pacing Guide **Forensics is a full year course that meets on a rotating basis for three (3) 55-minute blocks and one (1) 40-minute block for every five (5) day cycle.**	**Chapter 1:** Observation Skills, 2 weeks **Chapter 2:** Crime Scene Investigation and Evidence Collection, 3 weeks **Chapter 3:** Hair Analysis, 2 weeks **Chapter 4:** A study of Fibers and Textiles, 2 weeks **Chapter 5:** Forensic Botany, 2 weeks **Chapter 6:** Fingerprints, 2 weeks **Chapter 7:** DNA Profiling, 2 weeks **Chapter 8:** Blood and Blood Spatter**,** 2 weeks **Chapter 9:** Forensic Toxicology, 2 weeks **Chapter 10:** Handwriting Analysis, Forgery and Counterfeiting, 2 weeks **Chapter 11:** Forensic Entomology, 2 weeks **Chapter 12:** Death: Manner, Mechanism, Cause, 2 weeks **Chapter 13:** Soil Examination, 2 weeks **Chapter 14:** Forensic Anthropology, 3 weeks **Chapter 15:** Glass Evidence , 2 weeks **Chapter 16:** Casts and Impressions, 2 weeks **Chapter 17:** Tool Marks, 1 week **Chapter 18:** Firearms and Ballistics, 1 week

21st Century Skills Standards:	
9.1 Personal Finance Literacy	**9.1.12.A.3:** Analyze the relationship between various careers and personal earning goals. **9.1.12.A.4:** Identify a career goal and develop a plan and timetable for achieving it, including educational/training requirements, costs, and possible debt **9.1.12.B.1:** Prioritize financial decisions by systematically considering alternatives and possible consequences. **9.1.12.C.4:** Determine the relationships among income, expenses, and interest. **9.1.12.E.4:** Evaluate how media, bias, purpose, and validity affect the prioritization of consumer decisions and spending. **9.1.12.E.5:** Evaluate business practices and their impact on individuals, families, and societies. **9.1.12.F.2:** Assess the impact of emerging global economic events on financial planning.
9.2 Career Awareness	**9.2.12.C.1:** Review career goals and determine steps necessary for attainment. **9.2.12.C.5:** Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.
Technology Standards	**8.1.12.A.2:** Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review. **8.1.12.A.4:** Construct a spreadsheet, enter data, and use mathematical or logical functions to manipulate data, generate charts and graphs, and interpret the results

Interdisciplinary Connections	**Sciences:** Forming hypothesis, states of matter, scientific observations and experiments, studying soil, chemical analysis of evidence, DNA and genetic code, structure and function of hair, using properties of light, plant morphology, microscopy, reflection and refraction of light, PCR reactions, restriction enzymes, effect of forces on blood (gravity, adhesion, cohesion, surface tension), chemistry of drugs, life cycles of insects, monitoring temperature variations, rigor mortis, decomposition of remains, autopsy procedures, heat loos by convection, conduction and radiation, soil composition, pH testing, Snell's Law, friction, gravity, projectile motion, velocity, trajectory, **Math:** calculating odds, calculating ratios and rates, probability and statistics, measurement, use trigonometry to calculate origin of blood, calculating accumulated degree hours, calculation of PMI from algol mortis, calculate height from bone analysis, solving equations for unknown, construct tables and graphs, measurement and scale, algorithms, solving proportions **Technology:** use of computers to sort fingerprints, biometric technology, computerized handwriting analysis, **History:** Forensics in history
NJSLS Career Ready Practices – These practices are demonstrated throughout the curriculum	CRP1. Act as a responsible and contributing citizen and employee. CRP2. Apply appropriate academic and technical skills. CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions. CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. CRP9. Model integrity, ethical leadership and effective management. CRP10. Plan education and career paths aligned to personal goals. CRP11. Use technology to enhance productivity. CRP12. Work productively in teams while using cultural global competence.

Differentiation/Accommodations/Modifications

Gifted and Talented	English Language Learners	Students with Disabilities	Students at Risk of School Failure
(content, process, product and learning environment) **Extension Activities:** • Conduct research and provide presentation of mathematical topics. • Design surveys to generate and analyze data to be used in discussion. • Use of higher level questioning techniques. • Provide assessments at a higher level of thinking.	**Modifications for Classroom:** **Modifications for Homework/Assignments** Modified assignments. • Extended time for assignment completion as needed. • Use graphing calculator. • Highlight formulas.	*(appropriate accommodations, instructional adaptations, and/or modifications as determined by the IEP or 504 team)* **Modifications for Classroom:** • Ask students to restate information, directions, and assignments. • Repetition and practice. • Model skills / techniques to be mastered. • Extended time to complete class work. • Provide copy of classnotes. • Preferential seating to be mutually determined by the student and teacher. • Students may request books online, on tape/CD, as available and appropriate. • Assign peer helper in the class setting. • Provide regular parent / school communication • Provide oral reminders and check student work during independent work time.	**Modifications for Classroom:** • Ask students to restate information, directions, and assignments. • Repetition and practice. • Model skills / techniques to be mastered. • Extended time to complete class work. • Provide copy of classnotes. • Preferential seating to be mutually determined by the student and teacher. • Students may request books online, on tape/CD, as available and appropriate. • Assign peer helper in the class setting. • Provide oral reminders and check student work during independent work time. • Assist student with long and short term planning of assignments • Provide regular parent / school communication. • Assign peer helper in the class setting.

		• Assist student with long and short term planning of assignments **Modifications for Homework** • Extended time to complete assignments. • Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. • Provide the student with clearly stated (written) expectations and grading criteria for assignments. **Modification for Assessments** • Extended time on classroom tests and quizzes. • Student may take / complete tests in an alternate setting as needed. • Restate, reread, and clarify directions/questions. • Distribute study guide for classroom tests. • Establish procedures for accommodations / modifications for assessments.	• Provide oral reminders and check student work during independent work time. • Assist student with long and short term planning of assignments **Modifications for Homework** • Extended time to complete assignments. • Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. • Provide the student with clearly stated (written) expectations and grading criteria for assignments. **Modification for Assessments** • Extended time on classroom tests and quizzes. • Student may take / complete tests in an alternate setting as needed. • Restate, reread, and clarify directions/questions. • Distribute study guide for classroom tests. • Establish procedures for accommodations / modifications for assessments.

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CONTENT: Chapter 1

Theme: Observation Skills

Essential Questions:
What is the role of a forensic scientist?
What factors can influence witness accounts?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS3-1 HS-ETS1-2
• Observation Skills • eyewitness accounts • how to be a good observer • what forensic scientists do	• Define forensic science • Explain what may influence the eyewitness testimony • Explain why perception is important in forensics	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 2 Weeks
			Materials: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2

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CONTENT: Chapter 2

Theme: Crime-Scene Investigation and Evidence Collection

Essential Questions:
Why must a crime scene be secured and processed in a methodical and procedural manner?
What are the most important tasks in properly processing all aspects of a crime scene?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-ETS1-2 **Time Frame:** 3 weeks **Materials**: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2
• The principle of exchange • types of evidence • The investigation team • The seven tasks	• Summarize Locard's Principle of Exchange • Identify examples of trace evidence • Distinguish between direct and circumstantial evidence • Summarize the 7 steps of a crime scene • Explain the importance of securing the crime scene • Identify the methods by which a crime scene is documented • Demonstrate proper technique in collecting and packaging trace evidence • Explain what is means to map a crime scene • Describe how evidence from a crime scene is analyzed	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	

CONTENT: Chapter 3

Theme: Hair Analysis

Essential Questions:
What information can hair provide?
How can differences in the characteristics of hair can help an investigation?

Content *(As a result of this learning segment, students will know…)*

- History of hair analysis
- Structure and function of hair
- Types of hair
- Collecting hair in the investigation
- Hair examination and testing

Skills *(As a result of this learning segment, students will be able to…)*

- Identify the various parts of a hair
- Describe variations in the structure of the medulla, cortex and cuticle
- Distinguish between human and non-human animal hair
- Determine if two examples of hair are likely to be from the same person
- Explain how hair can be used in a forensic investigation
- Calculate the medullary index for a hair
- Distinguish hairs from individuals belonging to broad racial categories

Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

- Homework
- Warm up exercises
- Exit Tickets
- Group activities
- Section quizzes
- Chapter tests
- Cumulative tests
- Projects / Presentations
- Midterm exam
- Final Exam

Standards:
HS-LS1-1
HS-LS3-3
HS-ETS1-2

Time Frame:
2 week

Materials:

Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations
ISBN-13: 978-305-10792-2

CONTENT: Chapter 4

Theme: Study of Fibers and Textiles

Essential Questions:
How are fibers used to link suspects to the crime scene or to the victims?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS3-3 HS-PS-1-1
• that fibers can be identified using microscopes and by observing their chemical properties • how to evaluate fiber evidence • fiber classification • weave patterns of textiles	• Identify and describe common weave patterns of textile samples • Compare and contrast various types of fibers through physical and chemical analysis • Describe principal characteristics of common fibers used in their identification • Apply forensic science techniques to analyze fibers	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 2 weeks **Materials**: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2

CONTENT: Chapter 5

Theme: Forensic Botany

Essential Questions:
How does plant ecology establish where and when a crime was committed?
What are the proper methods of processing an outdoor crime scene?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-ETS-1-2 **Time Frame:** 2 week **Materials**: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2
• History of forensic botany • How forensic botany is used to solve cases • botanical crime scene analysis	• Describe the different forms of forensic botanical evidence • Explain how botanical evidence links a person or object to a crime scene • Explain the roles of gymnosperms, angiosperms, seals plants, and fungi in terms of providing botanical evidence • Describe the correct procedures for collecting, labeling and documenting botanical evidence • Explain why a forensic botanist should consult with local individuals	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	

CONTENT: Chapter 6

Theme: Fingerprints

Essential Questions:
Can fingerprints identify a criminal with absolute certainty?
How are fingerprints collected from different types of crime scenes?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS1-1 HS-ETS1-2 **Time Frame:** 2 weeks **Materials**: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2
• historical development of fingerprinting • Types of fingerprints • fingerprint analysis	• describe the characteristics of fingerprints • Compare and contrast the basic types of fingerprints • Describe how criminal attempt to alter their fingerprints • Present and refute arguments that question fingerprint evidence reliability • Lift a latent print	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	

CONTENT: Chapter 7

Theme: DNA Profiling

Essential Questions:
What information can DNA tell us about an individual?
How have technological advancements helped DNA samples to be reliable and valuable type of evidence?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS1-1 HS-LS1-2 HS-ETS1-2
• Collection and Preservation of DNA evidence • DNA fingerprinting using gel electrophoresis • STR analysis, Y and mitochondrial DNA	• Explain how DNA can be important to criminal investigation • Explain how crime-scene evidence is processed to obtain DNA • Explain what a short tandem repeat (STR) is, and explain its importance to DNA profiling • Explain how new and existing DNA evidence compare • Describe the use of DNA profiling using mtDNA and Y STRS to help identify a person using the DNA of family members • Compare and Contrast a gene and a chromosome, and in intron and exon	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 2 weeks **Materials**: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2

CONTENT: Chapter 8

Theme: Blood and Blood Spatter

Essential Questions:
What can blood spatter patterns tell an investigator about a crime?
How can these patterns be used to reconstruct a crime?

Content *(As a result of this learning segment, students will know…)*

- HIstory of the study of blood
- composition of blood
- Probability and Blood types
- Blood spatter analysis
- directionality of blood
- Blood stain patterns
- Angle of Impact Calculations
- Blood Velocity
- Spatter Size
- Collection of blood evidence

Skills *(As a result of this learning segment, students will be able to…)*

- Describe the forensic significance of the different types of blood cells
- Outline the procedure used to determine blood type
- Describe how to screen for the presence of human blood
- Describe the proper procedures of handling blood evidence
- Analyze blood spatter evidence using angle of impact, area of convergence and area of origin
- Calculate probability of specific blood type using data from population studies

Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

- Homework
- Warm up exercises
- Exit Tickets
- Group activities
- Section quizzes
- Chapter tests
- Cumulative tests
- Projects / Presentations
- Midterm exam
- Final Exam

Standards:
HS-ETS1-2

Time Frame:
2 weeks

Materials:

Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations
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CONTENT: Chapter 9

Theme: Forensic Toxicology

Essential Questions:
What makes a substance poisonous?
How can toxicology help to determine how a person died when exposed to toxins or poisons?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS1-2 HS-ETS-1-2
• Detection, collection and storage of toxicology evidence • Testing and reporting of drugs and poisons • Heavy metals, gases, poisons and toxins • Pesticides and Herbicides • Drugs and crime • The five schedules of drugs • Illegal drugs • Controlled substances	• provide examples of drugs, poisons and toxins • List factors that affect drug toxicity • Describe the role of a toxicologist in analyzing evidence • Compare and contrast presumtive testing and confirmatory testing • Describe how people get exposed to environmental toxins • Relate the signs and symptoms of overdose with a specific substance or combination of substances • Show the relationships between the law, crime and use of drugs	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 2 weeks **Materials**: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2

CONTENT: Chapter 10

Theme: Handwriting Analysis, Forgery, and Counterfeiting

Essential Questions:
What does a person's handwriting say about them?
Can handwriting samples identify a person?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS1-4
• Handwriting characteristics • handwriting analysis • handwriting evidence in the courtroom • forgery • counterfeiting	• Explain how a sample of handwriting evidence is compared with and exemplar using both qualitative and quantitative characteristics • Describe some of the limitations of handwriting analysis • Identify a historical case of document fraud and explain how the document was created • Describe the limitations of handwriting analysis • Describe features of new paper currency that protect against counterfeiting • Compare and contrast older paper currencies with new currencies • Identify counterfeit currency	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 1 week **Materials**: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2

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CONTENT: Chapter 11

Theme: Forensic Entomology

Essential Questions:
How can insects help investigator solve crimes?
What are the proper procedures of locating and collecting insect evidence?

Content *(As a result of this learning segment, students will know…)*

- How entomology is used in forensics
- Limitations of forensic entomology
- insect decomposition
- estimating postmortem interval
- how to process a crime scene for insect evidence

Skills *(As a result of this learning segment, students will be able to…)*

- Compare and contrast the four stages of blowfly metamorphosis, and describe the significance of blowflies in forensic entomology
- describe the effect of different environmental factors on insect development
- describe the five stages of decomposition
- Relate the process of insect succession to the changing environment that occurs during the stages of decomposition
- Explain how forensic entomologists interpret forensic evidence and environmental conditions to estimate a postmortem interval
- Explain how insect evidence is analyzed to provide evidence of the deceased person's identity or drug, poison, or toxin exposure
- Summarize the producers for documenting and collecting insect evidence from a crime scene

Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

- Homework
- Warm up exercises
- Exit Tickets
- Group activities
- Section quizzes
- Chapter tests
- Cumulative tests
- Projects / Presentations
- Midterm exam
- Final Exam

Standards:
HS-LS1-4
HS-ETS1-2
HS-PS1-2
HS-PS3-4

Time Frame:
2 weeks

Materials:
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CONTENT: Chapter 12

Theme: Manner, Mechanism and Cause of Death

Essential Questions:
How is the manner and cause of death determined?
How doe we determine what findings are due to factors that occurred before death or after death?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS1-2 HS-ETS1-2 HS-PS1-5
• body changes after death • liver and rigor mortis • internal and external autopsy • stages of decomposition	• Distinguish between cellular death and death of an organism • Distinguish among cause, manner and mechanism of death • Explain how algor, rigor and livor mortis develop following death • Compare and contrast the roes of medical examiners • Describe the procedures of an autopsy, and give examples of how an autopsy helps establish the cause of death, manner of death, and postmortem interval	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 2 weeks
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CONTENT: Chapter 13

Theme: Soil Examination

Essential Questions:
How do scientists use soil's unique characteristics to solve crimes?
How is soil analyzed?
How do we recognize alterations to soil?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS1-1 HS-LS1-2 HS-ETS1-2 HS-PS1-3
• soil composition and characteristics • soil formation • mineral composition and origins of sand • pH of soil • decomposition • succession	• Distinguish characteristics of different soils • compare and contrast different soil layers • analyze soil using microscopes • Describe the effects of soil on decomposing organic matter • Explain how soil analysis can link a suspect or victim to a crime scene • summarize how to collect and document soil evidence	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 2 weeks
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CONTENT: Chapter 14

Theme: Forensic Anthropology

Essential Questions:
What can be determined by analyzing skeletal remains?
Which techniques are used to identify skeletal remains?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-LS1-1 HS-LS1-2 HS-ETS1-2
• bone biology and anatomy • bones and geography • estimate age of bones • how to determine height from long bones • skeletal trauma analysis	• construct a biological profile from forensic information • distinguish among different segments of bone and explain their significance for forensic anthropology • apply knowledge of bones to estimate the age of skeletal remains • distinguish between male and female bones • provide examples of drama to bones • explain significance of isotopes in bone analysis • describe methods used to analyze skeletal remains	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 3 weeks
			Materials: Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations ISBN-13: 978-305-10792-2

CONTENT: Chapter 15

Theme: Glass Evidence

Essential Questions:
How do we use glass as clues to help solve a crime?
How is glass classified and how do we identify its properties?
How can we determine the impact on broken glass?

Content *(As a result of this learning segment, students will know…)*	**Skills** *(As a result of this learning segment, students will be able to…)*	**Assessments** (The above Essential Questions will be assessed with the following formative and summative measures:)	**Standards:** HS-ETS1-1 HS-PS1-3
• the components of different types of glass • reflection and refraction of glass • calculating density of glass • evidence from bullet fractures • forensic glass analysis technology	• Describe 3 major components of glass • describe the physical properties of glass • estimate the refractive index of glass • distinguish between radical and concentric fractures • analyze bullet holes in glass • properly collect and document glass evidence	• Homework • Warm up exercises • Exit Tickets • Group activities • Section quizzes • Chapter tests • Cumulative tests • Projects / Presentations • Midterm exam • Final Exam	**Time Frame:** 2 weeks
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CONTENT: Chapter 16

Theme: Casts and Impressions

Essential Questions:
What types of impressions can be used in an investigation?
What procedures are used to observe and capture impressions?

Content *(As a result of this learning segment, students will know…)*

- Three types of impressions
- correlation between size of foot and height
- shoe wear patterns
- techniques used to lift print impressions
- collecting and analyzing dental impressions

Skills *(As a result of this learning segment, students will be able to…)*

- provide examples of how impression evidence gives clues
- distinguish among latent, patent and plastic impressions
- outline procedures for collecting impression evidence
- describe features of tire impressions
- analyze impression evidence

Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

- Homework
- Warm up exercises
- Exit Tickets
- Group activities
- Section quizzes
- Chapter tests
- Cumulative tests
- Projects / Presentations
- Midterm exam
- Final Exam

Standards:
HS-LS1-1
HS-ETS1-2

Time Frame:
2 weeks

Materials:
Textbook: 2015 *Bertino and Bertino* Forensic Science: Fundamentals and Investigations
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CONTENT: Chapter 17

Theme: Tool Marks

Essential Questions:
What are the proper procedures in identifying tool-mark evidence?
What are the 3 major categories of tool marks?
How do we identify tool mark evidence?

Content *(As a result of this learning segment, students will know…)*

- Indentation marks, abrasion marks, and cutting marks
- tool mark evidence
- casting impressions of tool marks
- tool mark identification technology

Skills *(As a result of this learning segment, students will be able to…)*

- analyze evidence from tools and tool marks
- describe variations in tool surfaces
- compare and contrast the 3 major types of tool marks
- outline the sequence of procedures for collecting tool mark evidence

Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

- Homework
- Warm up exercises
- Exit Tickets
- Group activities
- Section quizzes
- Chapter tests
- Cumulative tests
- Projects / Presentations
- Midterm exam
- Final Exam

Standards:
HS-ETS1-1
HS-PS1-2

Time Frame:
1 week

Materials:
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CONTENT: Chapter 18

Theme: Firearms and Ballistics

Essential Questions:
What are the different types of firearms?
How do we identify unique markings of different types of firearms?
How do we trace the path of a bullet back to the shooter?

Content *(As a result of this learning segment, students will know…)*

- firearms
- ballistics
- rifles, pistols, revolvers
- bullets and cartridges
- caliber of a cartridge
- gunshot residue
- gravity and trajectory
- use trajectory to estimate location of shooter

Skills *(As a result of this learning segment, students will be able to…)*

- Be able to perform operations on a pair of functions to obtain a third function.
- Be able to find the composition of a function.

Assessments (The above Essential Questions will be assessed with the following formative and summative measures:)

- Homework
- Warm up exercises
- Exit Tickets
- Group activities
- Section quizzes
- Chapter tests
- Cumulative tests
- Projects / Presentations
- Midterm exam
- Final Exam

Standards:
HS-ETS1-1
HS-PS2-1

Time Frame:
1 week

Materials:
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