Unit 4: Fingerprints, Document Examination & Computers

Content Area: **Science**
Course(s): **Forensics**
Time Period: **3rd Marking Period**
Length: **5 Weeks**
Status: **Published**

Unit Overview

Describe the characteristics of fingerprints and identify the basic types of fingerprints. Describe the characteristics of a questioned document, the common individual characteristics of handwriting and the features of paper currancy that prevent counterfeiting. Describe the role that computers and information technolgy plays in forensic science.

Transfer

Students will be able to independently use their learning to...

What kinds of long term, independent accomplilshments are desired?

Identify the different characteristics of fingerprints.

Distinguish between visible and latent fingerprints.

Lift and process a latent fingerprint.

Describe some of the technolgy used in handwriting analysis.

Identify if paper currancy is counterfeit.

Identify the different parts of the computer.

List the areas of the computer that needs to be examined to retreive forensic data.

Meaning

Understandings

Students will understand that...

What specifically do you want students to understand?

What inferences should they make/grasp/realize?

The common ridge characteristics of a fingerprint.

The major fingerprint patterns and their subclasses.

The concept of the AFIS.

The twelve types of handwriting exemplars.

The role of a forensic handwriting expert.

The difference between fraud and forgery.

The security features built into paper currancy.

How a computer works.

The procedure for collecting and preserving computer related evidence.

Essential Questions

Students will keep considering...

What thought provoking questions will foster inquiry, meaning making and transfer?

What are the characteristics of fingerprints?

What is the difference between visible, plastic and latent fingerprints?

How would you determine if a fingerprints match?

How do criminals attempt to alter their fingerprints?

What are the common exemplars of handwriting?

What are the major goals of a handwriting expert?

How does the US Tresurey do to prevent counterfeiting?

What areas of the computer need to be examined to retrieve forensic data?

How is forensic data reteived from a confiscated computer?

Application of Knowledge and Skill

Students will know...

Students will know...

What facts and basic concepts should students know and be able to recall?

The common ridge characteristics of a fingerprint.

The three fingerprint patterns and their subclasses.

Visible, plastic and latent fingerprints.

The reliability of fingerprints as a means of identification.

AFIS.

The individual characteristics of handwriting.

The twleve examplars of handwriting.

The goals of a forensic handwriting expert.

The difference between fraud and forgery.

The features of paper currancy to prevent counterfeiting.

The hardware and software components of a computer.

The procedure for preserving computer evidence at a crime scene.

The areas of the computer where forensic data is found.

Students will be skilled at...

Students will be skilled at...

What discrete skills and processes should students be able to use?

Identifying the characteristics of fingerprints and the basic types of fingerprints.

Distiguishing between visible, plastic and latent fingerprints.

Lifting and preserving a latent fingerprint.

Identifying the common handwriting exemplars.

Distinguishing bewtween fraud and forgery.

Identifying the features of paper surrancy that prevents counterfeiting.

Understanding how computer software and hardware work together.

Identify the proper procedure preserving and collecting computer evidence at a crime scene.

Academic Vocabulary

anthropometry, arch, core, delta, digital imaging, fluoresce, iodine fuming, latent fingerprint, loop, ninhydrin, plastic print, ridge characteristics, minutiae, sublimation, superglue fuming, visible print, whorl.

exemplar, indented writing, infrared luminescence, natural variations, obliteration, questioned document, counterfeiting, document analysis, document expert, forgery, fraudulence.

bit, byte, CPU, cluster, cache, cookies, firewall, hacking, hardware, motherboard, operating system, partition, sector, sorftware, temporary file, unallocated space, visible data.

Learning Goal 1

Students will be able to discribe the characteristics of fingerprints and identify the basic types of fingerprints.

NGSS Science and Engineering Practices Standards

1: Asking questions and defining problems.

2: Developing and using models.

3: Planning and carrying out investigations.

4: Analyzing and interpreting data.

5: Using mathematics and computational thinking.

6: Constructing explanations and designing solutions.

7: Engaging in argument from evidence.

8: Obtaining, evaluating, and communicating information.

SCI.HS-LS3-1	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

Target 1

SWBAT describe the common ridge characteristics of a fingerprint.

Target 2

SWBAT list the three major fingerprint patterns and their respective subclasses.

Target 3

SWBAT list the techniques for developing latent fingerprints and describe the procedures for preserving a latent fingerprint.

Target 4

SWBAT determine the reliability of fingerprints as a means of identifucation and decribe the concept of AFIS.

Learning Goal 2

Students will be able to identify a questioned document and understand the common characteristics of handwriting.

NGSS Science and Engineering Practices Standards

1: Asking questions and defining problems.

2: Developing and using models.

3: Planning and carrying out investigations.

4: Analyzing and interpreting data.

5: Using mathematics and computational thinking.

6: Constructing explanations and designing solutions.

7: Engaging in argument from evidence.

8: Obtaining, evaluating, and communicating information.

Target 1

SWBAT describe the twelve types of handwriting exemplars that can be analyzed in a document.

Target 2

SWBAT identify the major goals of forensic handwriting analysis.

Target 3

SWBAT distiguish between forgery and fraudulence.

Target 4

SWBAT describe the features of paper currency that are used to prevent counterfeiting.

Learning Goal 3

Students will be able to understand the roles that computers and information technolgy have in forensic science.

NGSS Science and Engineering Practices Standards

1: Asking questions and defining problems.

2: Developing and using models.

3: Planning and carrying out investigations.

4: Analyzing and interpreting data.

5: Using mathematics and computational thinking.

6: Constructing explanations and designing solutions.

7: Engaging in argument from evidence.

8: Obtaining, evaluating, and communicating information.

SCI.HS-PS4-5	Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.
SCI.HS-PS4-2	Evaluate questions about the advantages of using a digital transmission and storage of information.

Target 1

SWBAT list and describe the major components of a computer system.

Target 2

SWBAT list the areas of a computer that will be examined to retrieve forensic data,

Target 3

SWBAT describe the prpoer procedure for preserving computer evidence at a crime scene.

Formative Assessment and Performance Opportunities

Oral question & answer discussion, in-class observation, written exercises, classwork & homework assignments, power point w/ notes, lab reports, projects, portfolios, quizzes and tests.

Summative Assessment

Unit assessment, project based assessments, lab reports, tests and quizzes.

Accommodations/Modifications

Specific to this unit, students with little computer skills will be supported during lessons involving technology. Aditional materials, such as videos and simplified articles will be made available.

Ex.

A Simplified Guide to Fingerprint Analysis

Fingerprint Analysis Worksheet

Questioned Documents

All instruction, labs, activities, and assessments will be modified and enhanced to adhere to individual student's IEPs and 504s. Differentiated classroom management strategies will be utilized as to adhere to these students individual plans.

Unit Resources

- Textbook - Forensic Science: An Introduction – 2nd Edition
- supplemental textbook materials
- Internet resources
- teacher generated power points & notes and lab materials.

21st Century Life and Careers

CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.

Interdisciplinary Connections

LA.RST.11-12.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
LA.RST.11-12.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
LA.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.