



Program Transfer Goals

- Ask questions, recognize and define problems, and propose solutions.
- Safely and ethically collect, analyze, and evaluate appropriate data.
- Utilize, create, and analyze models to understand the world.
- Make valid claims and informed decisions based on scientific evidence.
- Effectively communicate scientific reasoning to a target audience.

PACING

First Nine Weeks					Second Nine Weeks				Third Nine Weeks			Fourth Nine Weeks			
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12	Unit13	Unit 14	Unit 15	Unit 16

Assurances for a Guaranteed and Viable Curriculum

Adherence to this scope and sequence affords every member of the learning community clarity on the knowledge and skills on which each learner should demonstrate proficiency. In order to deliver a guaranteed and viable curriculum, our team commits to and ensures the following understandings:

Shared Accountability: Responding to the Needs of All Learners

- High levels of learning for all students.
- The district and course formative assessments aligned to the standards for this course support educators and learners in monitoring academic achievement and leveraging interventions.

Shared Understanding: Curriculum Design

- The district curriculum design weaves together the elements of content, skills and assessments in order to adhere to curriculum design at the macro and micro level, ensuring vertical alignment.
- The district curriculum incorporates standards, scope and sequence, enduring understandings, essential questions, performance assessments, and recommended resources.

Interdependence: Curriculum Units

Members of the learning community utilize the curriculum units, plan collaboratively, and reflect on results for continuous improvement.

The district curriculum units may be found: <http://tinyurl.com/Coppell-Curriculum>

UNIT 1: INTRODUCTION TO FORENSIC SCIENCE

TIMELINE: 1 WEEK

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Students will know...

- Application of science to law.
- How crime labs are organized in the U.S. and what services they provide.
- Federal rules of evidence
- Daubert vs. Frye
- Growth of FS through history.
- Basic types of law.
- Basic understanding of the criminal justice system.

Students will be skilled at...

- Articulate the nuances of the criminal justice system.
- Applying scientific standards and process to the law.
- Articulate different fields within forensic science and what career choices there are.
- Applying federal rules of evidence to determine admissibility of evidence.
- Describe how the scientific method is used to solve forensic problems.
- Describe different jobs done by forensic scientists and the experts they consult.

UNIT 2: TYPES OF EVIDENCE

TIMELINE: 1 WEEK

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Students will know...

- The value of direct and indirect evidence in a court of law.
- Eyewitness accounts have limitations.
- The probative value of physical evidence.
- Goals of a forensic scientist.

Students will be skilled at...

- Explain the difference between direct and indirect evidence.
- What is physical evidence and how is it used.
- Class vs. individual evidence.

- Significance of class evidence.

UNIT 3: THE CRIME SCENE

TIMELINE: 2 WEEKS

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Students will know...

- The steps to take when processing a crime scene.
- Type evidence determines what packaging should be used.
- Why the chain of custody must be preserved.

Students will be skilled at...

- Isolate, record, and search for evidence at a mock crime scene.
- Collect and package evidence at a mock crime scene using proper forensic procedures.

UNIT 4: FINGERPRINTS

TIMELINE: 2 WEEKS

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Students will know...

- Why fingerprints are individual evidence.
- Why there may be no fingerprint evidence at a crime scene.
- How computers have made personal identification easier.

Students will be skilled at...

- Define the three basic properties that allow individual identification by fingerprints.
- Obtain an inked, readable fingerprint for each finger.
- Recognize and classify the three general ridge patterns (loops, whorls, and arches) and apply them to the primary Henry - FBI classification.
- Identify and compare friction ridge characteristics and compare two fingerprints with at least 10 points of identification.
- Tell the difference among latent, plastic, and visible fingerprints.
- Develop latent prints using physical and chemical methods.

- Use simple probability theory to estimate odds.
- Identify questions and concepts that guide scientific investigations.

UNIT 5: HAIR

TIMELINE: 1-2 WEEKS

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Students will know...

- Hair is class evidence.
- Hair can be used to back up circumstantial evidence.
- Hair absorbs and adsorbs substances both from within the body and from the external environment.

Students will be skilled at...

- Successfully using a microscope
- Describe structure of hair
- Tell the difference between human and animal hair
- Tell which characteristics of hair are important for forensic analysis.
- Assess the probative value of hair samples.
- Identify questions and ideas that guide scientific investigations.
- Communicate and defend scientific argument.

UNIT 6: FIBERS

TIMELINE: 1 WEEK

Transfer Goals:

- Ask questions, recognize and define problems, and propose solutions.
- Safely and ethically collect, analyze, and evaluate appropriate data.
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Students will know...

- Why fibers are class evidence.
- How fibers can be used as circumstantial evidence to link victim, suspect and crime scene.
- What statistics are important in determining the value of evidence.

Students will be skilled at...

- Sample populations using statistical analysis.
- Distinguish and identify different types of fibers.
- Understand polymerization

- Carry out an experiment in TLC.
- Judge the probative value of fiber evidence.
- Design and carry out scientific investigations.
- Use technology and math to improve investigations and communications.
- Identify questions and concepts that guide scientific investigations.
- Communicate and defend a scientific argument.

UNIT 7: DRUGS

TIMELINE: 2-3 WEEKS

Transfer Goals:

- Ask questions, recognize and define problems, and propose solutions.
- Safely and ethically collect, analyze, and evaluate appropriate data.
- Utilize, create, and analyze models to understand the world.
- Make valid claims and informed decisions based on scientific evidence.
- Effectively communicate scientific reasoning to a target audience.

Students will know...

- How to apply deductive reasoning to a series of analytical data.
- The limitations of presumptive (screening) tests.
- The relationship between the electromagnetic spectrum and spectroscopic analysis.
- The difference between qualitative and quantitative analysis.
- The dangers of using prescription drugs, controlled substances, OTC, and alcohol.

Students will be skilled at...

- Chemically identify illicit drug types.
- Classify the types of illicit drugs and their negative effects.
- Discuss the federal penalties for possession and use of controlled substances.
- Explain the need for confirmatory tests.
- Describe IR, UV-VIS spectroscopy, and GC-MS, and explain how they are used in forensic science.
- Present and interpret data with graphs.
- Use the Physicians' Desk Reference (PDR) to identify pills.

UNIT 8: TOXICOLOGY - POISONS AND ALCOHOL

TIMELINE: 2 WEEKS

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Students will know...

- The danger of using alcohol.
- The quantitative approach to toxicology.

Students will be skilled at...

- Discuss the connection of blood alcohol levels to the law, incapacity, and test results.
- Understand the vocabulary of poisons.
- Design and conduct scientific investigations
- Use the technology and mathematics to improve investigations and communications.
- Identify questions and concepts that guide scientific investigations.
- Communicate and defend a scientific argument.

UNIT 9: TRACE EVIDENCE

TIMELINE: 2 WEEKS

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Students will know...

- How to apply deductive reasoning to analytical data.
- How to follow qualitative analytical schemes.
- How to gather and use information to solve problems.

Students will be skilled at...

- identify traces of white powder.
- Identify metals.
- Classify lip prints.
- Compare paint chips from hit-and-run cases.
- Use chromatography to compare lipsticks.
- Design and conduct scientific investigations.
- Identify questions and concepts that guide scientific investigations.
- Communicate and defend a scientific argument.

UNIT 10: SOIL AND GLASS ANALYSIS

TIMELINE: 1 WEEK

Transfer Goals:

- Ask questions, recognize and define problems, and propose solutions.
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- Utilize, create, and analyze models to understand the world.
- Make valid claims and informed decisions based on scientific evidence.
- Effectively communicate scientific reasoning to a target audience.

Students will know...

- Why soils are class evidence.

- When soils can be used as circumstantial evidence.
- How to present data mathematically using graphs.
- The differences between physical and chemical properties.
- How glass can be used as evidence.
- How individual evidence differs from class evidence.
- The nature of glass.
- Reflection, refraction and refractive index.

Students will be skilled at...

- Identify soils common constituents.
- Relate soil type to the environment.
- Interpret a topographic map.
- Understand the concept of spectrophotometry and its applications.
- Identify questions and concepts that guide scientific investigations.
- Make density measurements on very small particles.

UNIT 11: BLOOD

TIMELINE: 3 WEEKS

Transfer Goals:

- Ask questions, recognize and define problems, and propose solutions.
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- Utilize, create, and analyze models to understand the world.
- Make valid claims and informed decisions based on scientific evidence.
- Effectively communicate scientific reasoning to a target audience.

Students will know...

- That an antibody and an antigen of different types will agglutinate, or clump, when mixed together.
- That blood evidence's significance depends on a characteristic relative occurrence in the population.

Students will be skilled at...

- Determine whether a stain is blood.
- Determine whether a bloodstain is human or animal blood.
- Determine the blood type of a simulated bloodstain using the ABO/Rh system.
- Explore bloodstain patterns as a function of velocity, direction, and height of fall.
- Design and conduct scientific investigations.
- Use technology and math to improve investigations and communications.
- Identify questions and concepts that guide scientific investigations.

UNIT 12: DNA ANALYSIS

TIMELINE: 3 WEEKS

Transfer Goals:

- Ask questions, recognize and define problems, and propose solutions.
- Safely and ethically collect, analyze, and evaluate appropriate data.

- Utilize, create, and analyze models to understand the world.
- Make valid claims and informed decisions based on scientific evidence.
- Effectively communicate scientific reasoning to a target audience.

Students will know...

- The DNA is a long chain polymer found in nucleated cells, which contain genetic information.
- The DNA can be used to identify or clear a potential suspect in a crime.
- How DNA is extracted and characterized.
- How to apply the concepts of RFLP, PCR, and STRs to characterize DNA.
- The role that stats plays in determining the probability that two people would have the same sequence in a fragment of DNA.

Students will be skilled at...

- Explain that DNA is a long molecule, tightly packed in the form of a chromosome with genetic material wrapped around it.
- Isolate and extract DNA from cells.
- Describe the function and purpose of a restriction enzyme.
- Calculate probabilities of identity using STRs.
- Use technology and math to improve investigations and communications.
- Identify questions and concepts that guide scientific investigations.
- Communicate and defend a scientific argument.

UNIT 13: FORENSIC ENTOMOLOGY AND HUMAN DECOMPOSITION

TIMELINE: 2 WEEKS

Transfer Goals:

- Ask questions, recognize and define problems, and propose solutions.
- Safely and ethically collect, analyze, and evaluate appropriate data.
- Utilize, create, and analyze models to understand the world.
- Make valid claims and informed decisions based on scientific evidence.
- Effectively communicate scientific reasoning to a target audience.

Students will know...

- The stages of death.
- The role of insects play in the decomposition of carrion.
- Postmortem interval (PMI)
- How insects can be used to estimate PMI.
- The life cycle of insects.
- How variables affect results of scientific experiments.

Students will be skilled at...

- Distinguished among major insects types associated with carrion.
- Identify the relationship between insect type and the stages of death.
- Perform the same experiments that forensics entomologists do.
- Estimate time of death from case description.
- Rear flies from pupae and larvae adult.
- Explore variables affecting the determination of time of death.

UNIT 14: HUMAN REMAINS (ANTHROPOLOGY)

TIMELINE: 2-3 WEEKS

Transfer Goals:

- Ask questions, recognize and define problems, and propose solutions.
- Safely and ethically collect, analyze, and evaluate appropriate data.
- Utilize, create, and analyze models to understand the world.
- Make valid claims and informed decisions based on scientific evidence.
- Effectively communicate scientific reasoning to a target audience.

Students will know...

- How anthropologists can use bones to determine whether remains are human; to determine the sex, age, and sometimes race of an individual; to estimate height; and to determine when the death may have occurred.

Students will be skilled at...

- Distinguish between a male and a female skeleton.
- Give an age range after examining unknown remains.
- Describe differences in skull features among the three major racial categories.
- Estimate height by measuring long bones.
- Use technology and math to improve investigations and communications.
- Identify questions and concepts that guide scientific investigations.
- Communicate and defend a scientific argument.

UNIT 15: FIREARMS, TOOLMARKS, AND IMPRESSIONS

TIMELINE: 2 WEEKS

Transfer Goals:

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- Utilize, create, and analyze models to understand the world.
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- Effectively communicate scientific reasoning to a target audience.

Students will know...

- How class and individual evidence can answer different questions
- How impressions analysis is used in forensic science.
- The impact of firearms in the United States.
- The importance of microscopic examination in forensic science.

Students will be skilled at...

- Distinguish types of firearms.
- Measure individual features of bullets and cartridge casing.
- Describe how a handgun works.
- Use color test to find a gunshot residue.
- Describe the procedure for estimating the distance between muzzle blast and target.

- Make cast of different types of impressions.
- Evaluate and present scientific data.
- Communicate and defend a scientific argument.

UNIT 16: DOCUMENT AND HANDWRITING ANALYSIS

TIMELINE: 2-3 WEEKS

Transfer Goals:

- Ask questions, recognize and define problems, and propose solutions.
- Safely and ethically collect, analyze, and evaluate appropriate data.
- Utilize, create, and analyze models to understand the world.
- Make valid claims and informed decisions based on scientific evidence.
- Effectively communicate scientific reasoning to a target audience.

Students will know...

- Forensic evidence from handwriting and documents may be used to support scientific claims in investigations.

Students will be skilled at...

- Use language use and patterns to link handwriting samples to the writers.
- Use evidence to support claims made about the author of a document.
- Design and carry out scientific investigations.
- Use technology and math to improve investigations and communications.
- Identify questions and concepts that guide scientific investigations.
- Communicate and defend a scientific argument.