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Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Forensic Science

Unit 1 - The Crime Scene and Physical Evidence

Belleville Board of Education

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Unit Overview

1. Introduction to the history and development of forensic science.
2. Observation skills and the factors that influence eyewitness accounts of events.
3. Preserving and recording the crime scene.
4. The significance and examination of the common types of physical evidence.

Enduring Understanding

1. Forensic Science is interdisciplinary and is a culmination of many physical and biological sciences
2. Forensic Examination and Science as a discipline is used to preserve and translate physical evidence so that criminologist can make reasonable inferences about past events
3. Crime labs contain many different apparatus
4. The function of a forensic scientist is to gather and process evidence found, One of the most important tools of an investigator is the ability to observe, interpret and report their observations clearly.
5. One of the most important tools of the forensic investigator is the ability to observe, interpret and report observations clearly.

Essential Questions

1. What is the basic function of a forensic scientist?
2. What is a full service crime laboratory?
3. What special forensic services are available to law enforcement officials?
4. What is Locard's exchange principle?
5. What are the different types of physical evidence?
6. What is trace evidence?
7. Where does forensic science begin?
8. How can an entomologist assist in a crime scene investigation?
9. Why are observation skills important to forensic science?
10. checking for permissions

Exit Skills

1. Students will know: The major disciplines of forensic science. The components of a typical comprehensive crime lab. The specialized forensic services available to law enforcement personnel. The steps taken to thoroughly process and record a crime scene. Understand the concept of chain of custody. The common types of physical evidence found at the crime scene. The factors that influence eyewitness accounts of events. Locard's exchange principle. Identify the examples of trace evidence. The techniques for collecting and packaging physical evidence.
2. Relating observation skills to their use in forensic science.
3. Describing how evidence is collected and processed from a crime scene.
4. Understanding the concept of chain of custody.
5. Understand the contribution of the forensic entomologist can make to an investigation.

New Jersey Student Learning Standards (NJSLS-S)

HS-LS1-1	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.
HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
HS-LS1-5	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
HS-LS1-6	Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

Interdisciplinary Connections

MA.A-CED.A	Create equations that describe numbers or relationships
MA.A-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.
MA.A-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
LA.WHST.11-12.1.A	Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
LA.WHST.11-12.1.B	Develop claim(s) and counterclaims using sound reasoning and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.
MA.A-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
LA.WHST.11-12.1.C	Use transitions (e.g., words, phrases, clauses) to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
LA.WHST.11-12.1.D	Establish and maintain a style and tone appropriate to the audience and purpose (e.g., formal and objective for academic writing) while attending to the norms and conventions of the discipline in which they are writing.
LA.WHST.11-12.1.E	Provide a concluding paragraph or section that supports the argument presented.

Learning Objectives

1. Define forensic science and list the major disciplines it encompasses.
2. Describe the services of a typical comprehensive crime laboratory.
3. List the specialized forensic services that are available to law enforcement.
4. Define observation and describe examples of factors influencing eyewitness accounts of events
5. Relate observation skills to their use in forensic science and compare the reliability of eyewitness testimony to what actually happened.
6. Explain the role and responsibilities of the expert witness.
7. List the common types of physical evidence found at the crime scene.
8. Identify the methods of securing, searching, and documenting a crime scene.
9. Understand the concept of chain of custody and discuss the responsibilities of law enforcement officials present at the crime scene.
10. Understand the contributions that anthropology, entomology, and pathology make to forensic science.
11. Define physical evidence and identify the common types.

12. Identify the various parts of hair and distinguish between human and nonhuman animal hair.
13. Describe principal characteristics of common fibers used in their identification.
14. List the characteristics of glass and provide examples of the different types of glass.
15. List the important forensic properties of metal and paint.
16. List the important forensic properties of pollen and soil.

Suggested Activities & Best Practices

1. Use of Opening Scenarios
2. Use of Phenomenon Based Learning
3. Debates
4. Capstone Projects
5. End of Chapter Activities
6. Kinesthetic Learning Activity
7. Pre-writing and Writing Activities

Assessment Evidence - Checking for Understanding (CFU)

Chapter Quizzes and Tests (Summative)

Socratic Questioning (Formative)

Lab Journal (Alternative)

Common Department Benchmark (Benchmark)

Oncourse Assessment Tools (Formative)

Do Now and Exit Tickets (Formative)

- Admit Tickets
- Anticipation Guide
- Common Benchmarks

- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Learning Center Activities
- Multimedia Reports
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep
- Unit tests
- Web-Based Assessments
- Written Reports

Primary Resources & Materials

Forensic Science: Fundamentals and Investigations- new 3rd edition authors: Bertino & Bertino Publisher: National Geographic Learning/Cengage 7.12.20

Ancillary Resources

- Teacher and Publisher supplied power points, notes, guides, labs, and worksheets

  Resource manuals

  Internet Resources

  Computer Activities

- How Stuff Works podcast and www.howstuffworks.com
- "How lie Detectors Work" (30:21) teD talKS: https://new.ted.com
- Fraser, Scott: "Why eyewitnesses Get it Wrong." april 6, 2014. (20:50)
- Loftus, Elizabeth: "How reliable is your memory?" June 2013. (17:36)
- Meyer, Pamela. "How to Spot a liar." July 2011. (18:50)
- The innocence Project, www.innocenceproject.org
- youtube: www.youtube.com "are you a Good eyewitness?" (4:00) awareness test Card trick: "the mentalist—Cards awareness test" (00:58) awareness test Gorilla Basketball: "the monkey Business illusion" (1:42) "effective interrogation techniques 1 3" (14:52) "Forensics—making a Case: interviewing Suspects" (10:20) 60 minutes: "Picking Cotton": Part 1 (13:02) & 2 (13:08) "the eyewitness test: How Do you Stack Up?" (6:20) "the System: eyewitness testimony" (49:50)
- Pinterest: "How to Spot a liar"

Technology Infusion

Gizmos

Near POD

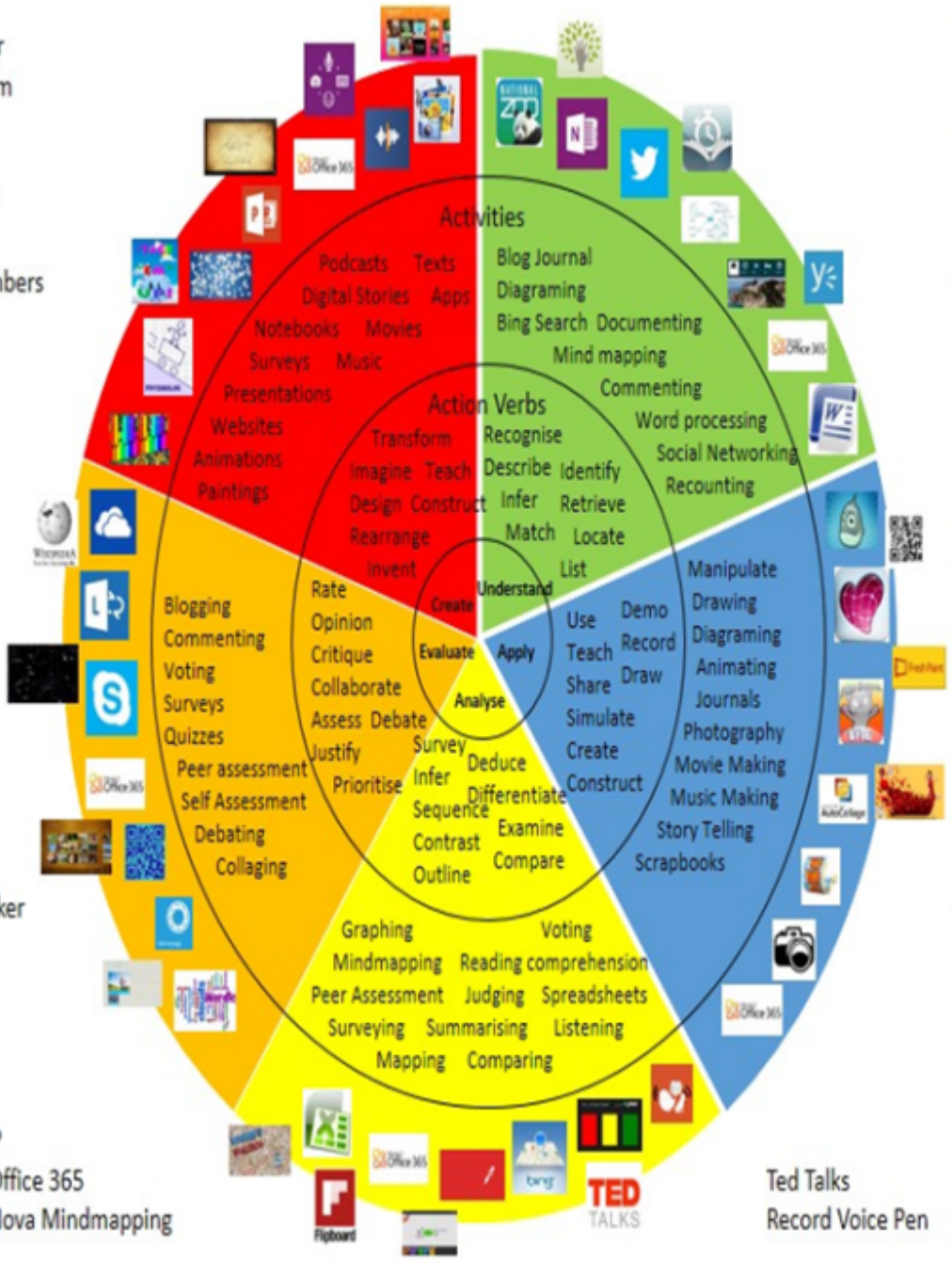
Google Classroom

JamBoards

Win 8.1 Apps/Tools Pedagogy Wheel

Podcasts
Photostory 3
Kid Story Builder
Music Maker Jam
Paint A Story
Office 365
MS PowerPoint
Stack 'Em Up
NqSquared Numbers
Physamajig
Xylophone 8

Wikipedia
Skydrive
Lync
SkyMap
Skype
Office 365
Puzzle Touch
Easy QR
Memorylage
Life Moments
Word Cloud Maker



Where's Waldo?
MS Excel Office 365
Flipboard Nova Mindmapping

Ted Talks
Record Voice Pen

Originally taken from http://www.coetail.com/vzimmer/files/2013/02/iPadagogy-Wheel.001.jpg
And adapted for Windows 8.1 devices by Charlotte Beckhurst @CharBeckhurst

Alignment to 21st Century Skills & Technology

- English Language Arts;
- Mathematics;
- Science and Scientific Inquiry (Next Generation);
- Social Studies, including American History, World History, Geography, Government and Civics, and Economics;
- World Languages;
- Technology;
- Visual and Performing Arts;

CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.
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.
CAEP.9.2.12.C.4	Analyze how economic conditions and societal changes influence employment trends and future education.
CAEP.9.2.12.C.5	Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.

CAEP.9.2.12.C.6	Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.
CAEP.9.2.12.C.7	Examine the professional, legal, and ethical responsibilities for both employers and employees in the global workplace.
CAEP.9.2.12.C.8	Assess the impact of litigation and court decisions on employment laws and practices.
CAEP.9.2.12.C.9	Analyze the correlation between personal and financial behavior and employability.
TECH.8.1.12.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.
TECH.8.1.12.C.CS2	Communicate information and ideas to multiple audiences using a variety of media and formats.
TECH.8.1.12.C.CS3	Develop cultural understanding and global awareness by engaging with learners of other cultures.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.

21st Century Skills/Interdisciplinary Themes

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

21st Century Skills

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

Differentiation

Small Group Instruction

Study Guides

Project Based Learning

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts

- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

Quiz and Test Study Guides

Graphic Organizers

Powerpoints posted on google classroom

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes

- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

English Language Learning (ELL)

Peer to assist students

Allow tests and quizzes to be taken in ESL room with extra time

Students allowed to use electronic devices for translation

Word Lists provided

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student’s learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher’s notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments

- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

At Risk

Provide modified test

Tutoring times offered

Allow students to correct test for partial credit

Extended time for assignments

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

Provide enrichment articles and assignments

Allow students to complete independent study assignments

- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge

Sample Lesson

Unit Name: Learing to see

NJSLS: see attached

Interdisciplinary Connection: see attached

Statement of Objective:

1. Describe some of the problems in making good observations.
2. Improve your observational skills.

Anticipatory Set/Do Now:

1. Your teacher will provide you with act 1-1 WKSt Photograph 1 and a question sheet. Study Photograph 1 for 15 seconds. When directed by your teacher, turn over the photograph and answer as many of the questions as you can without looking at the photo.

Learning Activity:

classroom Discussion

1. Did everyone answer all of the questions correctly?

2. if everyone viewed the same photograph, list some possible reasons their answers differed.

Final Analysis

1. Did your ability to see more detail and answer more questions correctly improve with practice? explain your answer.

2. Do you consider yourself a good observer? explain your answer.

Share Pair - Choose 1 of the case studies to examine the cases eye witness testimony - exchange information with your partner and create a Jamboard

Student Assessment/CFU's:see attached

Materials:Computers, Case Studies, Virtual or paper handouts

21st Century Themes and Skills: see attached

Differentiation/Modifications:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
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- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Integration of Technology: JamBoard, Google Classroom, and Document Hub

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HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
HS-ETS1-4	Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
LA.RH.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, qualitatively, as well as in words) in order to address a question or solve a problem.
LA.RH.11-12.8	Evaluate an author's claims, reasoning, and evidence by corroborating or challenging them with other sources.
LA.RH.11-12.9	Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.
	Range of Reading and Level of Text Complexity
LA.RH.11-12.10	By the end of grade 12, read and comprehend history/social studies texts in the grades 11-CCR text complexity band independently and proficiently.
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.11-12.2	Determine the central ideas, themes, or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
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.
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.
CAEP.9.2.12.C.4	Analyze how economic conditions and societal changes influence employment trends and future education.
CAEP.9.2.12.C.5	Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.
CAEP.9.2.12.C.6	Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.
CAEP.9.2.12.C.7	Examine the professional, legal, and ethical responsibilities for both employers and employees in the global workplace.