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| DMPS Forensics Curriculum | 2013 |
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**Iowa Core Statements**

* **Think critically and logically to make the relationships between evidence and explanations.**
* **Recognize and analyze alternative explanations and predictions.**
* **Understand and apply knowledge of chemical reactions.**
* **Demonstrate critical thinking skills using appropriate tools and resources.**
* **Understand and apply knowledge of the cell.**
* **Understand and apply knowledge of the molecular basis of heredity.**
* **Understand and apply knowledge of the structure and properties of matter.**
* **Synthesize information from a range of sources into a coherent understanding of a process, phenomenon or concept.**
* **Design and conduct a scientific investigation.**

**DMPS Graduate Ends Statements:**

***Graduates demonstrate strategies for lifelong learning***

• They exhibit competent thinking

• They exhibit intuitive thinking

• They understand systems and processes, including the understanding of underlying structures

• They exhibit creative and innovative thinking

• They anticipate future trends

• They demonstrate critical thinking and problem solving abilities

***Graduates demonstrate knowledge and understanding of a rigorous curriculum integrated into all content areas***

• They demonstrate proficiency in science, including life, earth and physical science

***Graduates possess technological and information literacy***

• They can access and evaluate information from a variety of sources to continue their learning

• They understand, manage and create oral, written and multimedia communication

• They utilize appropriate technology to apply or analyze information

**National Core Science Literacy Standards**

**Reading In Science**

***Key Ideas and Details***

1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

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.

***Craft and Structure***

4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.

***Integration of Knowledge and Ideas***

7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

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.

***Range of Reading and Level of Text Complexity***

10. By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

**Writing in Science**

***Text Types and Purposes***

**1. Write arguments focused on *discipline-specific content*.**

* 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.
* Develop claim(s) and counterclaims fairly 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.
* Use words, phrases, and clauses as well as varied syntax 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.
* Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
* Provide a concluding statement or section that follows from or supports the argument presented.

**2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.**

* Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
* Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.
* Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.
* Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
* Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).

***Production and Distribution of Writing***

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

***Research to Build and Present Knowledge***

7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.

9. Draw evidence from informational texts to support analysis, reflection, and research.

***Range of Writing***

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

**Unit 1: Introduction to Forensic Science and the Law**

**Approximate Timeline: 3 weeks**

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| **Content Standards** | **Content Objectives** | **Iowa Core Statements** | **Common Student-Centered Learning Targets** | **Common Assessments** | **Graduate Ends** |
| TechniquesInterpratationProbative ValueCritical Thinking / Supporting Claims with Evidence | * What is forensic science?
* Steps in pursuing justice
* Federal rules of evidence
* Types of evidence
* Analyzing a crime scene
 | **Think critically and logically to make the relationships between evidence and explanations.****Recognize and analyze alternative explanations and predictions.** | * I can explain the basic techniques that are used in processing a crime scene.
* I can explain the role of forensic science in our court system.
* I can explain different groups of evidence and evaluate their probative value.
* I can think critically about the similarities and differences between CSI/ related shows and real crime scene investigation.
 | Common assessments will NOT be created for this course at this time. | * *Graduates demonstrate strategies for lifelong learning*
* *Graduates demonstrate knowledge and understanding of a rigorous curriculum integrated into all content areas*
* *Graduates demonstrate proficiency in science, including life, earth and physical science*
* *Graduates possess technological and information literacy*
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**Suggested Resources: Unit 2: Fingerprints**

**Approximate Timeline: 2 weeks**

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| **Content Standards** | **Content Objectives** | **Iowa Core Statements** | **Common Student-Centered Learning Targets** | **Common Assessments** | **Graduate Ends** |
| TechniquesInterpratationProbative ValueCritical Thinking / Supporting Claims with Evidence | * Anatomy of fingerprints
* Identifying fingerprints
* Developing fingerprints
* Fingerprints as evidence
 | **Think critically and logically to make the relationships between evidence and explanations.****Recognize and analyze alternative explanations and predictions.****Understand and apply knowledge of chemical reactions.** | * I can explain techniques that are used to analyze fingerprint evidence.
* I can interpret fingerprint evidence. Examples may include identifying arch, loop, and whorl patterns, and identifying minutiae details.
* I can evaluate the probative value of fingerprint evidence.
* I can support a claim of fingerprint matches with evidence statements.
 |  | * *Graduates demonstrate strategies for lifelong learning*
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**Suggested Resources:**

**Unit 3: Hair/Fibers**

**Approximate Timeline: 2 weeks**

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| **Content Standards** | **Content Objectives** | **Iowa Core Statements** | **Common Student-Centered Learning Targets** | **Common Assessments** | **Graduate Ends** |
| TechniquesInterpratationProbative ValueCritical Thinking / Supporting Claims with Evidence | * Hair anatomy
* Disinguishing characteristics
* Basic characteristics of fibers
* Hair/fibers as evidence
 | **Think critically and logically to make the relationships between evidence and explanations.****Recognize and analyze alternative explanations and predictions.****Demonstrate critical thinking skills using appropriate tools and resources.** | * I can demonstrate techniques that are used to identify and match hairs and fibers.
* I can interpret hair and fiber evidence. This may include using microscopes to analyze and identify samples.
* I can explain the probative value of hair and fibers evidence.
* I can support a claim about hair and fiber evidence with critical thinking.
 |  | * *Graduates demonstrate strategies for lifelong learning*
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**Suggested Resources:**

**Unit 4: Forensic Toxicology**

**Approximate Timeline: 1 week**

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| **Content Standards** | **Content Objectives** | **Iowa Core Statements** | **Common Student-Centered Learning Targets** | **Common Assessments** | **Graduate Ends** |
| TechniquesInterpratationProbative ValueCritical Thinking / Supporting Claims with Evidence | * Drugs and crime
* Elements of toxicology
* Measuring toxicology
 | **Think critically and logically to make the relationships between evidence and explanations.****Recognize and analyze alternative explanations and predictions.****Understand and apply knowledge of chemical reactions.** | * I can explain techniques that are used to identify and measure toxicity in drugs and poisons.
* I can interpret data about unknown substances. This may include conducting and interpreting an unknown substances lab.
* I can interpret information about the role of drugs in crimes.
* I can evaluate the probative value of drug evidence.
* I can support claims with evidence.
 |  | * *Graduates demonstrate strategies for lifelong learning*
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**Suggested Resources:**

**Unit 5: Blood and DNA**

**Approximate Timeline: 3 weeks**

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| **Content Standards** | **Content Objectives** | **Iowa Core Statements** | **Common Student-Centered Learning Targets** | **Common Assessments** | **Graduate Ends** |
| TechniquesInterpratationProbative ValueCritical Thinking / Supporting Claims with Evidence | * Blood basics
* Blood typing
* Blood at the scene of the crime
* Extracting DNA
* PCR and electrophoresis
* Blood and DNA as evidence
 | **Think critically and logically to make the relationships between evidence and explanations.****Understand and apply knowledge of the cell.****Understand and apply knowledge of the molecular basis of heredity.****Recognize and analyze alternative explanations and predictions.** | * I can list and describe the components of human blood.
* I can distinguish between major blood groups.
* I can determine the trajectory of a blood droplet.
* I can separate the DNA from cells through a DNA extraction process.
* I can describe “PCR” and “Electrophoresis” and their importance in the field of Forensic Science.
* I can analyze given samples of DNA gels and blood typing evidence to determine if the sample has probative value.
 |  | * *Graduates demonstrate strategies for lifelong learning*
* *Graduates demonstrate knowledge and understanding of a rigorous curriculum integrated into all content areas*
* *Graduates demonstrate proficiency in science, including life, earth and physical science*
* *Graduates possess technological and information literacy*
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**Suggested Resources:**

**Unit 6: Human Remains**

**Approximate Timeline: 3 weeks**

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| **Content Standards** | **Content Objectives** | **Iowa Core Statements** | **Common Student-Centered Learning Targets** | **Common Assessments** | **Graduate Ends** |
| TechniquesInterpratationProbative ValueCritical Thinking / Supporting Claims with Evidence | * Parts of human skeleton
* Forensic anthropology
* Forensic entomology
 | **Think critically and logically to make the relationships between evidence and explanations.****Recognize and analyze alternative explanations and predictions.** | * I can name the major bones in the human skeleton.
* I can determine the approximate age and sex of a skeleton, given the appropriate tools.
* I can explain how forensic entomology can assist in analyzing human remains.
* I can identify the differences between rigor, algor, and livor mortis.
* I can describe the life cycle of an insect and explain how the life cycle has probative value in an investigation.
 |  | * *Graduates demonstrate strategies for lifelong learning*
* *Graduates demonstrate knowledge and understanding of a rigorous curriculum integrated into all content areas*
* *Graduates demonstrate proficiency in science, including life, earth and physical science*
* *Graduates possess technological and information literacy*
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**Suggested Resources:**

**Unit 7: Documents and Handwriting**

**Approximate Timeline: 2 weeks**

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| **Content Standards** | **Content Objectives** | **Iowa Core Statements** | **Common Student-Centered Learning Targets** | **Common Assessments** | **Graduate Ends** |
| TechniquesInterpratationProbative ValueCritical Thinking / Supporting Claims with Evidence | * Documents as evidence
* Methods of forgery
* Handwriting analysis
* Ink chromatography
 | **Think critically and logically to make the relationships between evidence and explanations.****Understand and apply knowledge of the structure and properties of matter.****Recognize and analyze alternative explanations and predictions.****Synthesize information from a range of sources into a coherent understanding of a process, phenomenon or concept.** | * I can analyze handwriting to determine whether or not the document is a forgery.
* I can list and describe various methods of forgery.
* I can construct a lab to analyze various inks using chromatography.
* I can research and write a report summarizing an infamous forgery case.
 |  | * *Graduates demonstrate strategies for lifelong learning*
* *Graduates demonstrate knowledge and understanding of a rigorous curriculum integrated into all content areas*
* *Graduates demonstrate proficiency in science, including life, earth and physical science*
* *Graduates possess technological and information literacy*
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**Suggested Resources:**

**Unit 8: Interpreting Forensics Data**

**Approximate Timeline: 2 weeks**

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| **Content Standards** | **Content Objectives** | **Iowa Core Statements** | **Common Student-Centered Learning Targets** | **Common Assessments** | **Graduate Ends** |
| TechniquesInterpratationProbative ValueCritical Thinking / Supporting Claims with Evidence | * Crime Scene Interpretation
* Collect and Intepret Data
* Support claim with evidence
 | **Think critically and logically to make the relationships between evidence and explanations.****Design and conduct a scientific investigation.****Recognize and analyze alternative explanations and predictions.** | * I can predict scientific outcomes in forensic science given graphs and applicable data.
* I can construct a graph and table using given forensic information.
* I can support a claim of whom is a suspect using given evidence and data.
* I can analyze given data and crime scene information and collaborate with peers to determine a conclusion.
 |  | * *Graduates demonstrate strategies for lifelong learning*
* *Graduates demonstrate knowledge and understanding of a rigorous curriculum integrated into all content areas*
* *Graduates demonstrate proficiency in science, including life, earth and physical science*
* *Graduates possess technological and information literacy*
 |

**Suggested Resources:**