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| Forensic Science Curriculum Overview | 2016-2017 |
| <http://science.dmschools.org> <http://grading.dmschools.org> |  |



Proficiency Scale

**Standards-Referenced Grading Basics**

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| **Evidence shows the student can...** | **Topic Score** |
| Demonstrate all learning targets from Level 2, Level 3, and Level 4 | 4.0 |
| Demonstrate all learning targets from Level 2 and Level 3 with partial success at Level 4 | 3.5 |
| Demonstrate all learning targets from Level 2 and Level 3 | 3.0 |
| Demonstrate all Level 2 learning targets and some of the Level 3 learning targets | 2.5 |
| Demonstrate all learning targets from Level 2 but none of the learning targets from Level 3 | 2.0 |
| Demonstrate some of the Level 2 learning targets and none of the Level 3 learning targets | 1.5 |
| Demonstrate none of the learning targets from Level 2 or Level 3 | 1.0 |
| Produce no evidence appropriate to the learning targets at any level | 0 |
| *\*Students who demonstrate success at Level 3 learning targets but not Level 2 learning targets are the students for whom additional investigation and multiple opportunities are most vital.* |

The teacher designs instructional activities and assessments that grow and measure a student’s skills in the elements identified on our topic scales. Each scale features many such skills and knowledges, also called learning targets. These are noted on the scale below with letters (A, B, C) and occur at Levels 2 and 3 of the scale. In the grade book, a specific learning activity could be marked as being 3A, meaning that the task measured the A item at Level 3.

The common core state **standard** code is located on each scale.



Each lettered bullet point represents one **Learning** **Target**.

The **Learning Goal** is the complete Level 3 of the scale.

When the time comes to identify the Topic Score for a topic, the teacher looks at all of the pieces of the Body of Evidence for that topic. The table to the right describes what Topic Score a student receives based on what the Body of Evidence shows. The scores listed on this table are the only valid scores that may be entered into the Topic Score assignment in a grade book.

**DMPS Grading Resources:** [**http://grading.dmschools.org/**](http://grading.dmschools.org/)

**Transitioning to the new Iowa Science Standards:**

In order to ensure our current K-12 students are scientifically-literate, global citizens who are prepared for college and career success, We are in the process of transitioning to new science standards that reflect what students in grades K-12 should know and be able to do as a result of instruction. Recognizing science is not just a body of knowledge that reflects current understanding of the world; it is also a set of practices used to establish, extend, and refine that knowledge, [Iowa’s Science Standards](https://iowacore.gov/iowa-core/subject/science) are written as a modified version of the [Next Generation Science Standards](http://www.nextgenscience.org/) and are designed to address six major conceptual shifts.

1. The NGSS reflect how science is done in the real world by intertwining three dimensions - [Scientific and Engineering Practices](http://www.nextgenscience.org/sites/default/files/Appendix%20F%20%20Science%20and%20Engineering%20Practices%20in%20the%20NGSS%20-%20FINAL%20060513.pdf), [Crosscutting Concepts](http://www.nextgenscience.org/sites/default/files/Appendix%20G%20-%20Crosscutting%20Concepts%20FINAL%20edited%204.10.13.pdf), and [Disciplinary Core Ideas](http://www.nextgenscience.org/sites/default/files/Appendix%20E%20-%20Progressions%20within%20NGSS%20-%20052213.pdf). Scroll to the bottom of each hyperlink to see the K-12 matrix for each practice and concept.
2. The NGSS are student performance expectations.
3. The NGSS build coherently from grades K through 12.
4. The NGSS focus on deeper understanding of content and applications of content.
5. The NGSS integrate science, technology, and engineering throughout grades K–12.
6. The NGSS correlate to the Common Core State Standards in English language arts (ELA) and mathematics.

**Teacher responsibilities for the 2016-17 school year.**

Working within your current curriculum, engage in the following activities over the course of next year. This is your time to intentionally focus on the crosscutting concepts and science and engineering practices before we completely switch to the new standards.

* Focus on deliberate, guided integration of **science and engineering practices** into lessons/units. It may be helpful to record which science and engineering practices are being used by students and modeled by teachers. Explicitly address all eight practices at some point throughout the year
* Use prompts that encourage students to identify and use appropriate **crosscutting concepts**. It may be helpful to post the crosscutting concepts in the room to help focus conversations and connections. Explicitly address all seven crosscutting concepts throughout the year.
* Field test lessons/unit and classroom assessments that are intentionally focused on building students’ learning toward each of the dimensions (SEPs, CCCs, and DCIs) of the new standards.
* Begin to intentionally teach content that was not previously taught and begin to pare down content that is no longer included or no longer emphasized in the standards.
* Begin evaluating instructional resources and begin modifying existing materials to more completely align with the standards.

Please contact Adam Puderbaugh at adam.puderbaugh@dmschools.org if you are interested in professional development opportunities around the new standards.

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| Timeline |
| *Topic* | *Description* | *Rough Timeline*  |
| 1. Introduction to Forensic Science
 | Students engage with a mock crime scene, collect evidence, and evaluate types of information | 3 Weeks |
| 1. Hair and Fingerprints
 | Evaluate and defend the value of hair and fingerprints as evidence | 3 Weeks |
| 1. Forensic Serology
 | Analyze and evaluate evidence derived from blood. | 3 Weeks |
| 1. The Data of Death
 | Use models to interpret the dead remains of an organism | 3 Weeks |
| 1. Non-Biological Evidence
 | Analyze evidence that is non-living | 3 Weeks |
| 1. Crime Scene Investigation
 | Investigate a crime and create a claim based on collected evidence and reasoned argument | 3 Weeks |

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| Topic: Introduction to Forensic Science |
| Level 4 | Level 3 | Level 2 | Level 1 |
| In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. | **Students will:**1. Implement the 7 S’s(secure the scene, separate the witnesses, scan the scene, seeing the scene, sketching the scene, searching for evidence, securing and collecting evidence) in a mock crime scene
2. Analyze a crime scene and generate questions based on informative pieces of evidence.
3. Distinguish between relevant and irrelevant evidence and discuss the validity and value of different types of information including eye witness testimony.
 | ***Students will:***Recognize or recall specific vocabulary such as: 1. Forensics, CSI Effect, Locard’s Exchange Principle, types of evidence: physical, testimonial, class, individual, circumstantial, direct.

Basic knowledge such as:1. Explain the impact of the CSI Effect on people’s perceptions.
2. Classify different types of evidence
3. Describe the participants of forensic investigations
 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |

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| Topic: Hair and Fingerprints |
| Level 4 | Level 3 | Level 2 | Level 1 |
| In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. | **Students will:**1. Compare and contrast fingerprints to deduce whether or not they are from the same source
2. Use proper techniques to obtain fingerprints
3. Investigate the structure of hair to determine what makes it unique
4. Make and defend a claim about the value of fingerprint and/or hair as evidence in the courtroom
 | ***Students will:***Recognize or recall specific vocabulary such as:1. Arch, Loop, Whorl, Minutiae, Latent Fingerprints, Plastic Fingerprints, Visible Fingerprints, Cuticle, Cortex, Medulla

Basic knowledge such as:1. Describe the anatomy of a fingerprint
2. Classify fingerprints according to their fingerprint type
3. Explain techniques used to obtain fingerprints from a crime scene
4. Describe the anatomy of hair
5. Explain the differences between different hair samples (human/human or human/animal)
 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |

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| Topic: Forensic Serology |
| Level 4 | Level 3 | Level 2 | Level 1 |
| In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. | **Students will:**1. Use modeling to describe human blood types.
2. Use mathematical techniques to interpret blood spatter at a crime scene.
3. Investigate factors that affect blood spatter and create rules that describe the observed relationship.
4. Create a model to determine the severity of punishment related to different schedules of drugs under the Controlled Substance Act.
5. Make and defend a claim about the value of forensic serology in the courtroom.
 | ***Students will:***Recognize or recall specific vocabulary such as:1. Serology, red blood cells, white blood cells, platelets, plasma, Punnett square, antibodies, antigens, agglutination, point of origin, DNA, blood spatter, angle of impact, gel electrophoresis, toxicology

Basic knowledge such as:1. Describe basic functions of each component of blood.
2. Describe the varying structures of red blood cells that create the different blood types.
3. Analyze blood spatter.
4. Interpret DNA test results.
5. Classify drugs based on individual characteristics.
 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |

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| Topic: The Data of Death |
| Level 4 | Level 3 | Level 2 | Level 1 |
| In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. | **Students will:**1. Make a claim about postmortem interval based on quantitative data.
2. Apply knowledge of entomological factors to crime scene investigation.
3. Use models to predict information for a biological profile such as the sex, age, origin, stature, and cause of death of skeletal remains.
 | ***Students will:***Recognize or recall specific vocabulary such as:1. Forensic entomology, postmortem interval (PMI), rigor mortis, algor mortis, livor mortis

Basic knowledge such as:1. Describe the major changes that happen to a body after death.
2. Describe the progression of entomological activity that occurs after death. (For example: insect life cycle and species succession.)
3. Name/identify the major bones in the human skeleton.
4. Use a graphic organizer to communicate the differences among various types of skeletons.
 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |

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| Topic: Non-biological Evidence |
| Level 4 | Level 3 | Level 2 | Level 1 |
| In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. | **Students will:**1. Create a rule to describe patterns in a handwriting sample.
2. Compare and contrast handwriting samples to determine whether or not they are from the same source.
3. Analyze the authenticity of questionable documents.
4. Identify the psychology that is at the root of a criminal's specific action.
5. Effectively communicate information gathered through research regarding the psychological behaviors of criminals
6. Compare and contrast impression patterns to determine whether or not they are from the same source.
 | ***Students will:***Recognize or record specific vocabulary such as: 1. forgery, handwriting characteristics, counterfeit, forensic psychology, sociopath, MacDonald triad, impression evidence

Basic knowledge such as:1. Explain factual/measurable characteristics of handwriting
2. Apply chromatography techniques to compare ink samples
3. Describe characteristics of U.S. currency that are designed to prevent counterfeiting.
4. Describe the relationship between criminal behavior and a person's psychology.
5. Describe the conditions that create impression evidence.
 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |

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| Topic: Crime Scene Investigation |
| Level 4 | Level 3 | Level 2 | Level 1 |
| In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. | **Students will:**1. Apply investigative techniques to collect, observe, and analyze "evidence" at a mock crime scene.
2. Plan and conduct a scientific test in order to compare known and unknown samples.
3. Evaluate the quality and validity of different types of evidence.
4. Make and defend a claim based on crime scene evidence.
 | ***Students will:***Recognize or recall specific vocabulary such as: 1. Claim, evidence, probative value

Basic knowledge such as:1. Describe the investigative techniques used at a crime scene
2. Understand how jurors weigh evidence in the courtroom
 | Student’s performance reflects insufficient progress towards foundational skills and knowledge. |