

## Grade 3 Science Unit: Crime Lab Chemistry (CLC)

Unifying Theme: Evidence, Models and Explanations

### Why

### What

### How

Enduring Understandings	Essential Questions	Major Indicators, Prioritized	Assessment Examples
<ul style="list-style-type: none"> <li>• Human fingerprints have recognizable patterns, and can be classified according to specific criteria.</li> <li>• The scientific techniques of fingerprinting and chromatography can be used to gather evidence.</li> <li>• By gathering evidence in a systematic way, we can ultimately make inferences and form conclusions.</li> </ul>	<ul style="list-style-type: none"> <li>• In what ways can we facilitate the observation of our fingerprints?</li> <li>• What criteria are used to classify the patterns found in fingerprints?</li> <li>• How can we use the techniques of fingerprinting and chromatography to gather evidence?</li> <li>• How much evidence do we need to make an inference or form a conclusion?</li> </ul>	<ul style="list-style-type: none"> <li>• 1.3.15 identify patterns detected with the senses (e.g., leaves, fingerprints, and shells). (MLO 1.2.4)</li> <li>• 1.3.11 classify objects, materials, concepts, and actions based on similarities and differences. (MLO 1.2.2)</li> <li>• 1.3.8 compare data, identify possible trends, and form conclusions. (MLO 1.1.7)</li> <li>• 1.3.14 provide supporting evidence when forming conclusions, devising a plan, or solving a practical problem. (MLO 1.2.3)</li> <li>• 4.3.4 explain simple methods for separating the components of a mixture. (no MLO listed for 4.3.4)</li> <li>• 1.3.1 access and process information from readings, investigations, and/or oral communications. (MLO 1.1.1)</li> </ul>	<p>Pre-assessment:</p> <ul style="list-style-type: none"> <li>• What have you heard or observed about fingerprints?</li> <li>• Describe what you know about mixing two colors to make a new color.</li> </ul> <p>Formative Assessment:</p> <ul style="list-style-type: none"> <li>• Given a set of fingerprints, correctly identify them as loops, arches, whorls, or mixed to monitor student understanding.</li> <li>• “Comparing Fingerprints,” page 43 of <i>Fingerprinting</i> teachers’ guide.</li> <li>• Compare 5 or more chromatograms that your teacher gave you. Which two are identical? What evidence led you to your decision? Use student responses to guide instruction.</li> </ul> <p>Summative Assessment:</p> <ul style="list-style-type: none"> <li>• “The Jealous Artist” developed by MCPS Science Office.</li> </ul>

## Grade 3 Science Unit: Crime Lab Chemistry (CLC)

### How

Suggested Instructional Sequence	Differentiation Examples
<p style="text-align: center;"><b><u>Fingerprinting Teacher Guide, GEMS</u></b></p> <ul style="list-style-type: none"> <li>• Making Fingerprints (Scientific Inquiry)               <ul style="list-style-type: none"> <li>- Practice the technique of fingerprinting.</li> </ul> </li> <li>• Classifying Fingerprints (Scientific Inquiry, Critical Thinking)               <ul style="list-style-type: none"> <li>- Make observations about fingerprints and categorize them based on similarities and differences.</li> <li>- Learn about the Standard Fingerprint Classification System and use it to classify fingerprints.</li> </ul> </li> <li>• Find Fingerprint Formulas (Applications of Science)               <ul style="list-style-type: none"> <li>- Use the Standard Fingerprint Classification System to determine own fingerprints.</li> <li>- Apply an abbreviated formula to the fingerprints.</li> </ul> </li> <li>• Solve a Crime (Scientific Inquiry, Applications of Science)               <ul style="list-style-type: none"> <li>- Apply knowledge of fingerprinting to gather evidence.</li> <li>- Form conclusions based on evidence, and discuss results.</li> </ul> </li> </ul> <p style="text-align: center;"><b><u>Crime Lab Chemistry Teacher Guide, GEMS</u></b></p> <ul style="list-style-type: none"> <li>• Explore Chromatography (Scientific Inquiry)               <ul style="list-style-type: none"> <li>- Make predictions about ink on filter paper in water.</li> <li>- Practice the technique of chromatography.</li> </ul> </li> <li>• Investigate Evidence Using Chromatography (Applications of Science)               <ul style="list-style-type: none"> <li>- Use chromatography to gather evidence.</li> </ul> </li> <li>• Identify the Mystery Pen (Scientific Inquiry, Critical Thinking)               <ul style="list-style-type: none"> <li>- Form conclusions based on evidence gathered using chromatography, and discuss results.</li> </ul> </li> <li>• Career Awareness               <ul style="list-style-type: none"> <li>- Engage students in career awareness activities to learn about forensic scientists, and fire marshals.</li> </ul> </li> </ul>	<p>Challenge:</p> <ul style="list-style-type: none"> <li>• Develop an original well-designed procedure that tests how marker pigments separate in a variety of solvents. Identify the variables and controls in your investigation. Share your findings with others for critical analysis. Discuss conclusions with supporting evidence to identify more investigative questions.</li> </ul> <p>Adjust:</p> <ul style="list-style-type: none"> <li>• Adjust the instructional idea above by providing direct instruction in small groups or by using technology such as a Flex Cam to magnify details in chromatograms and fingerprint patterns.</li> </ul> <p>ESOL:</p> <ul style="list-style-type: none"> <li>• Create an illustrated vocabulary chart on fingerprints.</li> </ul>