

### 8<sup>th</sup> Grade Enhanced Science Unit Synopsis (SAMPLE)

| UNIT TITLE        | BASE STANDARD(s)<br>COVERED   | EXTENSION  | ACTIVITIES  |
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| Physics in Sports | Newton's 3 Laws <ul style="list-style-type: none"> <li>• Inertia</li> <li>• Momentum</li> <li>• <math>F=ma</math></li> </ul> Simple Machines <ul style="list-style-type: none"> <li>• Mechanical Advantage</li> <li>• Mechanical Efficiency</li> </ul> Motion <ul style="list-style-type: none"> <li>• Acceleration</li> <li>• Velocity</li> <li>• Graphing</li> <li>• Power</li> </ul> | <p>Expanding knowledge of force, motion, and simple machines and the ability to apply Newton's laws to real world situations.</p> <p>Extending connections between the classroom and student activities while including current events (Olympics, CTE in the NFL, etc)</p> <p>Extending knowledge of force, motion and simple machines to engineer better tools/technique/safety precautions</p> | <ul style="list-style-type: none"> <li>• Project-based learning</li> <li>• Video-capture &amp; data analysis of motion</li> <li>• Using sensors to capture motion data</li> </ul> |

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| <p>Chemistry of the body</p> | <p>Acids/bases/neutralization<br/>Compounds<br/>Chemical reactions</p> <ul style="list-style-type: none"> <li>• Reactants</li> <li>• Products</li> <li>• Catalysts</li> <li>• Inhibitors</li> </ul> <p>Energy</p> <ul style="list-style-type: none"> <li>• Conversions</li> <li>• Thermal</li> <li>• Chemical</li> </ul> | <p>Extending understanding of acids and bases to bodily homeostasis and conditions like headaches</p> <p>Extending understanding of compounds and macromolecules as a source of chemical energy, and the differences in the chemical energy amounts compounds provide</p> <p>Extending understanding of catalysts and inhibitors in a bodily setting</p> | <ul style="list-style-type: none"> <li>• Acid-base titration</li> <li>• Food calorimetry and macromolecule identification</li> <li>• Using enzymes to create lactose-free milk/testing for residual sugars</li> </ul> |
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| <p>Forensics 101: Blood, Bullets, and Evidence</p> <p>The value of evidence, deductive reasoning, identifying unknown substances, ballistics, blood stain and spatter analysis, and CSI Web Adventures</p> | <ul style="list-style-type: none"> <li>*Science Process Skills <ul style="list-style-type: none"> <li>*measurement, scientific method, analysis of data, and use of models and simulations to illustrate and explain phenomena.</li> </ul> </li> <li>*The Nature of Matter <ul style="list-style-type: none"> <li>*elements, compounds, mixtures, physical and chemical properties and changes</li> </ul> </li> <li>*Work, Force, and Motion <ul style="list-style-type: none"> <li>*speed, velocity, acceleration</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>*Multidisciplinary unit- forensics includes chemistry, zoology, anatomy, genetics, physics, medicine, math and statistics, sociology, psychology, communications, and law.</li> <li>*Expanding skills/knowledge in laboratory techniques</li> <li>*Expanding upon the knowledge and understanding of the forensic scientist and the role he/she plays in solving crimes</li> <li>*Introducing students to the career of a forensic scientist.</li> <li>*Real world scenarios of the forensic scientist</li> <li>*Students gain confidence in their ability to make sense of complex problems that involve numerical data, evidence, logical reasoning, and uncertainty.</li> </ul> | <ul style="list-style-type: none"> <li>*Video- The Value of Evidence</li> <li>*Case study analysis</li> <li>*Identify an unknown substance based on physical and chemical properties of known types of matter</li> <li>*Blood stain and blood spatter analysis (guest speaker)</li> <li>*Analysis of bullet trajectory in determining the angles of the crime (guest speaker)</li> <li>*Use of technology to create a virtual reality scenario of crime scene investigation techniques.</li> </ul> |
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| <p>Forensics 102: Prints, Dents, and Solving the Case</p> | <ul style="list-style-type: none"> <li>*Science Process Skills <ul style="list-style-type: none"> <li>*measurement, scientific method, analysis of data, and use of models and simulations to illustrate and explain phenomena.</li> </ul> </li> <li>*The Nature of Matter <ul style="list-style-type: none"> <li>*elements, compounds, mixtures, physical and chemical properties and changes</li> <li>*chemical reactivity</li> <li>*radioactive carbon dating</li> <li>*physical separation of a mixture</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>*Multidisciplinary unit- forensics includes chemistry, zoology, anatomy, genetics, physics, medicine, math and statistics, sociology, psychology, archaeology, communications, and law.</li> <li>*Expanding skills/knowledge in laboratory techniques</li> <li>*Expanding upon the knowledge and understanding of the forensic scientist and the forensic archaeologist, and the roles they play in solving crimes together.</li> <li>*Introducing students to the career of a forensic archaeologist.</li> <li>*Real world scenarios of the forensic scientist.</li> <li>*Students gain confidence in their ability to make sense of complex problems that involve numerical data, evidence, logical reasoning, and uncertainty.</li> </ul> | <ul style="list-style-type: none"> <li>*Case study analysis</li> <li>*Dental Forensics Lab</li> <li>*Use of radioactive dating techniques(simulation) to determine the age of a radioactive material used to identify a missing person.</li> <li>*Ink chromatography</li> <li>*Fingerprint identification</li> <li>*Use of technology to create a virtual reality scenario of crime scene investigation techniques</li> </ul> |
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