

# Unit 4: Impressions, Ballistics and Tool Markings

Content Area: **Science**  
Course(s):  
Time Period: **Generic Time Period**  
Length: **4 weeks**  
Status: **Published**

## Unit Introduction

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This unit will cover the use of impressions, ballistics and tool markings in the identification of murder weapons as well as identification in the field of Forensic Science.

## Standards

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SCI.9-12.HS-ESS1-1.3.1	students understand the significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs. They recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. Students use orders of magnitude to understand how a model at one scale relates to a model at another scale. They use algebraic thinking to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).
SCI.9-12.HS-ESS1-4.3.1	Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).
SCI.9-12.HS-ESS1-2.5.1	Energy cannot be created or destroyed— only moved between one place and another place, between objects and/or fields, or between systems.
SCI.9-12.HS-ETS1-4.4.1	Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions— including energy, matter, and information flows— within and between systems at different scales.
SCI.9-12.HS-LS1-1.6.1	students investigate systems by examining the properties of different materials, the structures of different components, and their interconnections to reveal the system's function and/or solve a problem. They infer the functions and properties of natural and designed objects and systems from their overall structure, the way their components are shaped and used, and the molecular substructures of their various materials.
SCI.9-12.HS-PS1-2.1.1	students observe patterns in systems at different scales and cite patterns as empirical evidence for causality in supporting their explanations of phenomena. They recognize classifications or explanations used at one scale may not be useful or need revision using a different scale; thus requiring improved investigations and experiments. They use mathematical representations to identify certain patterns and analyze patterns of performance in order to reengineer and improve a designed system.
SCI.9-12.HS-PS1-4.5.1	Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.

## Essential Questions

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1. How can ballistics determine the person involved with a murder?
2. Why is the analysis of Impressions and tool markings important in the field of Forensic Science?

## **Content / Skills**

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### **Content**

- Analyze different impression types
- Describe the ballistics of a bullet
- Compare photographs and casts to analyze tools

### **Skills**

- Prepare and analyze a cast of a shoe
- Determine the trajectory of a bullet
- Compare different bullets to different firearms
- Analyze the impressions of tools as a means of identification