

# What's The Buzz?

## *CSI*

It is hard to believe that we are about to begin out last unit for this school year in the Discovery Lab. What a great year it has been! Our final unit of the year is titled CSI. Scientists work under a distinctive set of values. Students whose learning includes data, a testable hypothesis, and predictability in science will share in the values of the scientist they study. Additionally "science education is in a particularly strong position

to foster three attitudes and values: curiosity, openness to new ideas, and skepticism." Forensic science addresses each of these by engaging students in thought-provoking, open ended discussions and projects.

Forensics is a fascinating subject that employs all areas and types of science. To that end, it offers both an excellent platform for science instruction and practice as well as wide-ranging field for assessment.

This unit is a simple introduction to the world of Forensic Science. We cannot and will not have time to go in depth in all areas. The main areas of focus be on DNA, Finger-printing, Contact Traces, Forensic Laboratories, and Hair and Fiber analysis. The students will be given a tool of which to learn more about this area of Science in the future.

## *Greatest Discoveries in Genetics*

### **Rules of Heredity (1850s)**

Gregor Mendel discovers how genetic information is passed down through generations. Mendel's findings are ridiculed during his lifetime and he dies never knowing that he would come to be known as the "father of genetics."

### **Genes Are Located on Chromosomes (1910 - 1920s)**

Thomas Hunt Morgan discovers that genes are located on chromosomes.

### **DNA Is a Double Helix (1953)**

James Watson and Francis Crick describe the DNA molecule. The scientists suggest that the DNA molecule is made of two chains of nucleotides, each in a helix, one going up and the other going down.

### **DNA Polymorphism (1985)**

Alec Jeffreys discovers that some DNA sequences are unique to each individual, leading to the birth of DNA forensics.

### **Humans Have 20,000 to 25,000 Genes (2003)**

Humans have approximately 20,000 to 25,000 genes. It is hoped that understanding the genome will boost the fields of medicine and biotechnology, eventually leading to cures for diseases such as cancer and Alzheimer's disease.



Discovery Lab

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### 5th Grade Objectives for CSI

1. Develop and demonstrate an understanding of scientific inquiry using process skills.

- a. Form a hypothesis, predict outcomes, and conduct a fair investigation that includes manipulating variables and using experimental controls. (DOK 3)
- b. Distinguish between observations and inferences. (DOK 2)
- c. Use precise measurement in conjunction with simple tools and technology to perform tests and collect data. (DOK 1)

\* Tools (English rulers [to the nearest

one-sixteenth of an inch], metric rulers [to the nearest millimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, anemometers, rain gauges, barometers, hygrometers)

\* Types of data (height, mass, volume, temperature, length, time, distance, volume, perimeter, area)

d. Organize and interpret data in tables and graphs to construct explanations and draw conclusions. DOK 2

e. Use drawings, tables, graphs, and written and oral language to describe objects and explain ideas and actions. (DOK 2)

f. Make and compare different proposals when designing a solution or product. (DOK 2)

g. Evaluate results of different data (whether trivial or significant). (DOK 2)

h. Infer and describe alternate explanations and predictions. (DOK 3)



### 4th Grade Objectives for CSI

1. Explain and use skills necessary to conduct scientific inquiry.

- a. Form hypotheses and predict outcomes of problems to be investigated. (DOK 3)
- b. Use the senses and simple tools to gather qualitative information about objects or events (size, shape, color, texture, sound, position, change). (DOK 1)
- c. Demonstrate the accurate use of simple tools to gather and compare information (DOK 1)

\* Tools (English rulers [to the nearest eighth of an

inch], metric rulers [to the nearest centimeter], thermometers, spring scales, hand lenses, balances, microscopes, calculators, clocks, anemometers, rain gauges)

\* Types of data (height, mass/weight, temperature, length, distance, volume, area, perimeter)

d. Use simple sketches, diagrams, tables, charts, and writing to draw conclusions and communicate data results. (DOK 2)

e. Interpret and describe patterns of data using drawings, diagrams, charts, tables, graphs, and maps. (DOK 2)

f. Explain why scientists and engineers often work in teams with different individuals doing different things that contribute to the results. (DOK 2)

g. Draw conclusions about important steps (e.g., making observations, asking questions, trying to solve a problem, etc.) that led to inventions and discoveries. (DOK 3)



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GUES INVESTIGATION TEAM

# *A Year of Discovery!*

