

# PARENT LETTER FOR CSI DETECTIVES: CODING, CRIME SCENES, AND ROBOTS

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Dear Parents,  
We are excited about our CSI and Technology curricula!

The science curriculum uses two crime scenes that the students must solve using logic and science. The Technology curriculum will be described after the Science. We will alternate approximately every three weeks between the subjects.

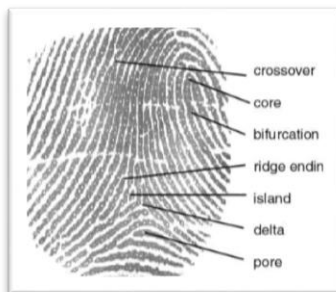
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## SCIENCE

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### CRIME SCENE: *BREAK IN*

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In this crime scene, a woman has had a valuable painting stolen from her home. To solve the crime the students must first learn to think like a detective and analyze the crime scene. They will then begin the role playing exercise where they are interrogated as witnesses or suspects.

They will learn to take fingerprints and analyze their own. Will they be eliminated from the suspect list? **Discovery Question:** What type of fingerprint did they have? They should be able to tell you whether they had whorls, loops or other combinations.



Next, we will analyze lipstick left at the crime. They will do a chromatography analysis to see who it belonged to. **Discovery Question:** What solvent was used to perform this experiment?

We also investigate why the alarm did not go off. We will create series and parallel circuits and create our own alarms as we learn about electricity. **Discovery Question:** which created a louder alarm or brighter light? Series or parallel connections?



We find an unknown powder so we do a powder analysis and a flame test. **Discovery Question:** What color does boric acid turn in this experiment?

There was also an unexplained footprint at the crime. **Discovery Question:** Whose handwriting did we discover with our handwriting analysis? Who was the culprit?

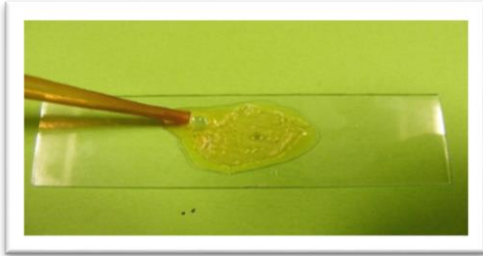
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## CRIME SCENE: *RED ROVER*

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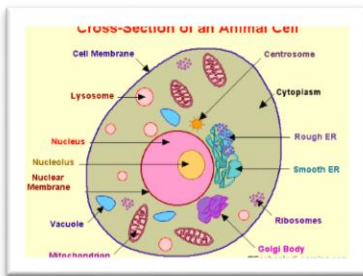
This involves a prize-winning dog being stolen! In Red Rover, we must learn about lab safety.

We will look at tool impressions to see what was used to break in to steal Clover.



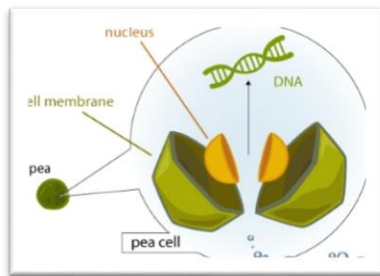
In order to understand the microbiology we will be doing, we will journey into an onion to look at cells under the microscope. **Discovery Question:** Ask your child what Osmosis is and how the salt affected the onion cell.

Your student will prepare and view slides of cheek cells, cardiac muscle, and bacteria using compound and digital microscopes. This will provide each student with hands on training of proper laboratory techniques for future upper level laboratory classes while exploring their cells on the microscopic level.



So just what is that in the bag? It is a 3-d cell model! Your student will explore cell parts, along with their functions by building a 3-D model of the cell using GAC. **Discovery Question:** See if your child can remember the parts of the cell.

We will also collect cheek swabs from all of our suspects and look at the results under the microscope.



We found hair at the scene so we will do a hair analysis and learn about how DNA can be used to solve a crime. In Bitten we will find out how to take teeth impressions. Clover was very unhappy about being stolen and bit our culprit. Was you child the culprit here? Make sure you take a look at our discovery table where the teeth impressions are.

Of course, there was blood from the bite (no real human blood) and so we need to be able to analyze that as well. We will use blood typing to find out who the guilty party is. **Discovery Question:** Ask your child what makes up blood and what the three types of cells do.

So who was the guilty party?

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## SPIES AND SLEUTHS EXTRAS

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If there is time at the end of class we will change hats and become Spies and Sleuths and investigate other types of crimes.

We will look at counterfeiting and code making. We will also find out how quickly a witness's memory can be lost and why we need to question our witnesses quickly.

I hope your child has as much fun in our program as we have in teaching them! We look forward to seeing you soon!

## TECHNOLOGY

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We are offering a variety of exciting technology and robotic activities for this Spring. Sessions include coding, robotics, and machines. Please note that shorter sessions may not complete all of the following.

### CodeCombat:



We are introducing a new coding mechanism that we believe the children will love:

Students will have a great adventure while they learn to code with CodeCombat. Choosing an Avatar to battle its way through levels, a student must complete the challenge by writing the correct code and sequence to move on. With success, the player gains gems which they can use to buy armor or skills to progress through the game. We will begin learning Python but the program can be used to teach LUA, Javascript and more. CodeCombat is considered one of the best learning tools and can be used at home.

### Robotics:



Robots will be built and programmed with Lego<sup>®</sup> MINDSTORMS<sup>®</sup> NXT's! Each robot built will concentrate on a specific function. Our first robot uses Move Blocks to introduce basic move abilities on the part of the student. As the programmer becomes more adept we add on the Touch Sensor to the front end of the robot. The touch sensor will depress when it comes into contact with a solid object. Students will program the bot to back up and turn in a different direction. The Ultrasonic Sensor robot will not need to have physical contact with a solid object. It will sense the wall it's headed toward, like a bat with echo location, and redirect its progression. The last bot we program will be a Light sensor bot. This bot will DeTEct different colors with the programming, telling the bot if it is going the right way. Green, red, and blue colored strips of tape will be laid out on the floor. As the robot passes over or comes in contact with these colors it will call the colors out so the students will know whether they are programming correctly or not.

## Simple and Motorized Machines



With Lego® **Simple Machines and Mechanisms** our students will build a Land Yacht as we explore different kinds of power and forces. Of course, the Land Yacht will use wind to enable it to roll across the floor. How fast will it go? If the wind blows straight at the land yacht from behind will the sail pick up the wind and move the yacht? Students will test wind angles to see which is the best. How about the size of the sail? If it were larger, would the yacht go faster? We will find out as we explore the power of wind!



Using **the Hammer** students will be testing the clutch power of gears. What is clutch power? Each gear used in the Lego® set has a different grip when it comes to the size of the gears. A smaller gear will grip the axle more loosely than a 40-tooth gear. What difference does it make? This relates to the force needed to pound a hammer into different types of wood. Some wood is denser than others and needs more force to pound home a nail! We will test to see how much force is used for each!



**Tower Crane:** Why do Cranes use pulleys for lifting? It takes less effort to lift heavy objects if you use a pulley, than if you were to lift a heavy object directly! What about speed? How does the weight of an object effect the speed with which it is lifted? Students will experiment with several pulley types and weights to explain how each one changes the outcome with each lifting experience.