



**High School Science Virtual Learning**

**Forensic Science**

**Tool Marks**

**May 4th, 2020**



## High School Forensic Science Lesson: May 4th, 2020

### **Objective/Learning Target:**

Students will be able to identify the tools used at a crime scene through use of impression techniques.

1. Go to this [website](#) to get a short overview of the different types of impressions. What are the two types of impressions left at a crime scene?
2. What kind of lighting is used to help find impressions at a crime scene and why?

1. Go to this website to get a short overview of the different types of impressions. What are the two types of impressions left at a crime scene? 1. Latent 2. Casting
2. What kind of lighting is used to help find impressions at a crime scene and why? Oblique lighting which is shining a light source diagonally at the ground, not vertically, the ridges of an impression create shadows which alert investigators to disturbed and uneven surfaces.



# Lesson Activity:

**Directions:** Review both of the following slide shows. The first one review how the marks are made and how the specific tools/ marks are examined. The second reviews the marks, how to caste them, and what they are used for in court.

**Link(s):** [Tool Mark Impressions](#)     [Tool Marks, Casting, Court](#)



# Practice

You will use the information from the activity on slide 5 to answer the following questions.



## Practice Questions- Answers can be found in the slideshows.

1. What are serial numbers used for?
2. What are the four types of class characteristics?
3. What are scratches sometimes called?
4. What type of instrument could cause crush or cut marks?
5. Why would the cast of the tool mark be made?
6. How can the tool be established?
7. What are two things that can affect the characteristics of a tool impression?
8. What are some characteristics that would be found on bone if it were cut with a table saw?
9. What are two ways to document tool mark evidence?
10. What are castings made of?
11. What are three ways to make comparisons for court usage other than visual comparisons?



## Answer Key: Once you have completed the practice questions check with the work.

1. What are serial numbers used for? - identification purposes
2. What are the four types of class characteristics? - Type of impression, General Shape, General Dimensions, Do not permit identification of exact tool used
3. What are scratches sometimes called? - slipped impressions
4. What type of instrument could cause crush or cut marks? - bolt cutters
5. Why would the cast of the tool mark be made? - the support onto which the toolmark is located cannot be collected as evidence.
6. How can the tool be established? - If the comparison marks and the incriminating tool marks match, then the tool is established.
7. What are two things that can affect the characteristics of a tool impression? - size and hardness
8. What are some characteristics that would be found on bone if it were cut with a table saw? - There would be parallel curved striations
9. What are two ways to document tool mark evidence? - photograph with a measuring device and measure the size of the impression mark.
10. What are castings made of? - Silicone or rubber
11. What are three ways to make comparisons for court usage other than visual comparisons? : toolmark databases, statistical algorithms, and contour maps





# More Practice

You will use the information from the activity on slide 3 to answer the following questions.



# More Practice Questions

Go to this [link](#) to see an alternative method impression method to casting.

1. What industry used polyvinyl siloxane impression materials long before forensics did?
2. What is an advantage of using polyvinyl siloxane?
3. What are the materials used?
4. What do you need to put on the fingerprint lift card before you remove the impression?
5. Before applying the emulsion spray, what should you be sure to check/ collect first?



# Answer Key

Once you have completed the practice questions check with the work.

1. What industry used polyvinyl siloxane impression materials long before forensics did? - Dental
2. What is an advantage of using polyvinyl siloxane? - ease of use, accuracy, and dimensional stability over time while disadvantages include cost of materials and slow setting times at lower temperatures.
3. What are the materials used? - orthodontic wax rope, silicone emulsion spray, AccuTrans brown casting silicone-polyvinyl siloxane, and a fingerprint lift card
4. What do you need to put on the fingerprint lift card before you remove the impression? - case number, orientation marks, date, and a sketch of the location
5. Before applying the emulsion spray, what should you be sure to check/ collect first? - DNA evidence



## Additional Practice

To find out some schools around here that have criminal justice degrees that specifically cover impression work go [here](#).

For some evidence and information from a real crime scene, go to pages 30-39 [here](#). .