



LEARNING MODULES

GK-12 DISSECT at New Mexico State University

Title: Fingerprint Search Algorithm

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Discipline or Area: Forensic Science

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School: Centennial High School

Subject of class: Forensic Science

Grade: 11/12

COVERAGE OF COMPUTATIONAL TOPICS

Provide a brief description of the topics and vocabulary you covered with this module.

Algorithms

Creating an algorithm

Branching

Computational Thinking

OBJECTIVES

Students will learn how to create an algorithm for a fingerprint search based on their knowledge of how fingerprints are identified. The purpose of this module is to teach students how to create a search algorithm while also reviewing terms from current lesson plans (fingerprints).

EQUIPMENT AND MATERIALS

Paper

Pen

Tape

BACKGROUND AND REFERENCES

Definitions and information used for steps in algorithm were taken from the high school forensics book (Forensic science for high school by Barbara Ball-Deslich, John Funkhouser, Chapter 4). Having students go through the steps of identifying a fingerprint helped them review the terms for fingerprints.

PROCEDURE

How module is taught:

1. Pre work: I made cutouts of different words related to fingerprints (shape, minutiae, etc.).
 - a. List of words I used is below
2. In the classroom I pasted all the cutouts on the board in random order.
3. I told the students that the object of the activity was to come up with a way to search for a fingerprint based on its characteristics.
4. Each student came up individually and decided what the next characteristic to search for would be.
 - a. I had them start with general characteristics (overall shape of a fingerprint) and then got more specific with minutiae.
5. Afterwards we did a class discussion on CT concepts used to complete the activity and tried to explain how a computer would do a search (briefly talked about how there is a lot of math involved).

Words used in module:

Dactyloscopy, loop, delta, core, whorl, arch, minutiae, ridge ending, island, bridge, eye, delta, bifurcation, dot, spur, double bifurcation, trifurcation

Goals for module:

Have the students think about how they identify fingerprints more logically and relate that to how a computer would perform the search algorithm.

How CT was introduced:

CT was introduced by talking about how an algorithm is created, the steps taken and incorporating other CT vocabulary when building the algorithm (branching, iteration, etc.).

How did I assess the understanding of CT:

Understanding was assessed through discussion after activity.

NOTES AND OBSERVATIONS

What were challenges you encountered in the overall development of the module?

It was challenging to figure out how to have all students involved. I tried to make enough terms so that each student would come up but it might have been more successful if done in groups.

What was successful?

Most students understood that we look for general characteristics first and then go to more specific ones. They were able to understand how branching was incorporated and what an algorithm is and can look like in pseudocode.

How was the students' reception to the content of the module?

Students were nervous at beginning but as the module continued they become quick and receptive on what their task was.