Problem-Based Learning

Who Did It?

Fifth Grade

Science

SC11503

Wake Forest®
School of Medicine

Who Did It?

Fifth Grade

Science

Standards/Objectives

5-PS1-3

Overview

There has been a crime in your classroom. It's up to you to figure out who did it. Students will explore concepts related to physical science.

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PBL Problem Guide

FOR FACILITATOR USE ONLY

Timeframe

This lesson plan will take approximately 1-1.5 hours.

Step-by-step guide

- Put students into teams of three to five members.
- Ask for a volunteer to read the STUDENT PROBLEM aloud [page 6].
- As a whole group, ask students to list What We Know [FACTS, page 7].
- Have each team create a list of What We Need to Know [NEED TO KNOWS & LEARNING ISSUES, page 8].
- Have each team begin a list of POSSIBLE HYPOTHESES [page 10].
- Allow teams to research LEARNING ISSUES [pages 8 & 11].
- Teams re-evaluate POSSIBLE HYPOTHESES [page 10] and determine one DEFENDABLE SOLUTION for Final Product [page 12].
- Teams create and present DEFENDABLE SOLUTION and individual students write ACTION PLAN [page 12].

PBL Resources

FOR FACILITATOR USE ONLY

Resources provided

Included with this case:

- Federal Bureau of Investigation - Fingerprint Identification Website

Resources to assemble

You may wish to assemble the following resources ahead of time (if you purchased the corresponding materials kit, the bolded items are included):

- **Fingerprinting kit**
- **Magnifying glasses**
- Ink (for fingerprints, if the kit isn't purchased)
- A crime scene (the facilitator will have to set it up; see Additional Information for Facilitator, page 9)

Student Problem

FOR STUDENT USE

There has been a crime in your classroom! An anonymous tip to your teacher said it's someone in your class. After observing the crime scene, it looks like fingerprints, footprints, and a strand of hair were left behind.

Consider:

- How will you develop a plan for solving this mystery?

Key Facts

FOR FACILITATOR USE ONLY

- There has been a crime in your classroom!
- An anonymous tip to your teacher said it's someone in your class.
- After observing the crime scene, it looks like fingerprints, footprints, and a strand of hair were left behind.

Need-to-knows / Learning Issues

FOR FACILITATOR USE ONLY

NEED TO KNOWS

- Where is the crime scene?
- What was stolen?
- What materials do we have for solving the mystery?
- Can we ask classmates questions to figure out who did it?
- Who was the last person in the classroom?

NEED TO KNOW ANSWERS

- The teacher's desk.
- The facilitator can make this up.
- A fingerprinting kit, magnifying glasses, and shoe print materials are available.
- Only questions about the evidence may be asked during the lesson.
- Any specific questions about the crime may be discussed within teams.

LEARNING ISSUES

- How do we analyze fingerprints?
- How do we analyze footprints?
- How do we analyze a strand of hair?

LEARNING ISSUE RESOURCES

- Students will research using the Learning Issue Resource Guide, page 11.

Additional Information

FOR FACILITATOR USE ONLY

The facilitator will need to set up a crime scene when the students are not in the room. The more believable the crime scene, the more students will be interested! You may want to use crime scence tape.

A student from the class must also secretly be chosen as the "thief" for the lesson. The student will need to volunteer a strand of hair, fingerprints (use ink or another visible substance), and a shoe print (may use dirt or another visible substance).

Teams will have to figure out ways to solve the mystery during the lesson. They may use the available resources, but if those are not purchased, the facilitator and students may come up with other ways.

The lesson will look chaotic, as teams are circulating to ask questions and perform tests, and that is a good thing! Let teams be creative in solving the mystery.

CORRELATING ACTIVITY

Have a police officer or detective come speak to the class about solving mysteries.

Hypotheses

FOR FACILITATOR USE ONLY

- Hypotheses will vary by which student is chosen as the "thief".

Learning Issue Resource Guide

FOR FACILITATOR USE ONLY

WEBSITES

Federal Bureau of Investigation-
Fingerprint Identification

http://www.fbi.gov/about-us/cjis/fingerprints_biometrics/fingerprint-overview

Teams may use this website to learn more about fingerprints and their uniqueness.

MANIPULATIVES

Fingerprinting kit

Magnifying glasses

The manipulatives will be used for solving the mystery.

Final Product and Writing Guide

FOR FACILITATOR USE ONLY

Team

- Teams will turn in their conclusions about who they found to be the thief. They must include their data collection information in the form of a list or chart.

Individual

- Each student will write an article for the school newspaper about the solved mystery. This should include the problem summary, learning issues they encountered, and how they came to their hypotheses and final product.

Who Did It?

Rubric

FOR FACILITATOR USE ONLY

AREA	ABOVE AVERAGE Three points each	AVERAGE Two points each	BELOW AVERAGE One point each	NO EVIDENCE Zero points each	POINTS
Final Product	• All Learning Issues addressed • Three or more hypotheses present • High quality final product	• Most Learning Issues addressed • Two hypotheses present • Roles somewhat defined • Fair quality final product	• Few learning issues addressed • One hypothesis present • Low quality final product	• No learning issues addressed • No hypotheses present • No final product	
Writing Assessment	• Problem Summary, Learning Issues/New Information Integrated well presented • Hypotheses well presented • Solution and Defense well presented	• Problem Summary, Learning Issues/New Information Integrated presented • Hypotheses presented • Solution and Defense presented	• Problem Summary, Learning Issues/New Information Integrated poorly presented • Hypotheses poorly presented • Solution and Defense poorly presented	• Problem Summary, Learning Issues/New Information Integrated not presented • Hypotheses not presented • Solution and Defense not presented	
Collaboration	• Individual works well with group members • Individual communicates well with group members • Individual carries out their individual responsibilities	• Individual works acceptably with group members • Individual communicates acceptably with group • Individual mostly carries out their individual responsibilities	• Individual does not work well with group members • Individual does not communicate well with group members • Individual attempts but fails to carry out their individual responsibilities	• Individual interferes with group members • Individual does not communicate at all • Individual does not attempt to carry out their individual responsibilities	

24 – 27 Points = Above Average 15 – 23 = Average 6 – 14 = Below Average 0 – 6 = Failing

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Problem-Based Learning

Wake Forest School of Medicine Problem-Based Learning provides essential case studies to K–12 teachers across the United States. These cases help support problem-based learning enrichment programs to focus on implementing Common Core State Standards. Access useful and easy-to implement case studies on Math, English Language and other STEM topics online at www.wakeproblembasedlearning.com.

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