

Lab Examination of Glass Fractures

Objective

You will examine several pieces of fractured glass to determine the direction of force and the sequence in which the fractures occurred.

Background Story

It's late, and Mr. and Mrs. Hubbard are in the kitchen getting a bedtime snack. They are still discussing the rise of violence in their neighborhood, and the fear this violence has caused. Neighborhood violence is a topic they have discussed daily, and with good reason. The increase in burglaries and assaults in their part of town has been alarming.

"Try not to worry all the time, Martha," Mr. Hubbard is saying. "You know that I've put new locks on all the doors, and I have bought a gun for every room. Remember, there is one on the top of the refrigerator."

"Of course I remember. As a matter of fact, I wish I could forget that we have a house full of guns. You know that I don't like them, and I don't want them in our home. We've been over this issue a thousand times, and you are still buying guns."

"I feel like we need a little extra protection right now. I hope this violence will come to an end, but no one can guarantee it. I don't want us to be defenseless."

"And I don't want us to accidentally shoot each other. I'm taking my ice cream and book up to bed to read for a while." Mrs. Hubbard pauses and looks back at her husband. "Can you at least promise me that you won't use the guns?"

"Well, Martha, I can't do that. But I will promise to *try* not to use them. I'll only pull one out in an emergency."

Martha heads upstairs, but freezes on the top landing when she hears three gunshots in quick succession. She drops her bowl and races down the stairs to find Mr. Hubbard standing in the kitchen, gun in one hand and spoon in the other. There are three bullet holes in the window.

Materials

Window glass containing three bullet holes

Hand lens

Labels

Rulers

Procedure

1. Examine the window and the bullet holes in it. Notice that one side of the window is marked "inside."
2. By examining the shape of the holes and noticing the entrance point and potential exit paths, determine whether the *bullets* were fired from the outside of the house toward the inside, or from the inside to the outside. Enter this information on the Data Table.
3. Examine the fracture lines. Determine which bullet hole was created first. Remember, none of the fracture lines from the first hole will end at another fracture line. Enter this information on the Data Table.
4. Determine the sequence in which the other two bullet holes were formed. Enter this on the Data Table.

*You will be examining 4 separate window panes. You will then create answers for each window pane (4 in total).

Data Table

Window Pane Identification Letter	Fired from INSIDE of the house	Fired from OUTSIDE of the house	Order in which the holes were created (1st, 2nd, 3rd)

Postlab Questions

You will answer questions 1, 2, and 3 for EACH window pane you studied.

1. Do you think that Mr. Hubbard shot his gun? Why?
2. Which bullet hole was created first: A, B, or C? Was this hole made by a bullet entering the house or by a bullet leaving the house? How do you know?
3. When Mrs. Hubbard came downstairs, the first thing she asked her husband was, "What happened?" Mr. Hubbard told her that someone had taken three shots at him. Do you think his story is true? Why or why not?
4. Based on your lab results, write an end to the scenario presented in the Background Information.
Do this for only 1 of the window panes you studied ... and indicate which one you are writing about!
5. Below, re-create one of the window panes you studied (and indicate which one) and label the following:
 - Pinpoint the intersections where the radial lines from one hole intersect another concentric line.
 - Count the number of concentric lines being produced from each hole (and write this below the picture).