White Powder
The two white powders found on the suspect's shoes were baking soda and cornstarch. These white powders both look the same, so as detectives we are going to test how they react to other chemicals in order to differentiate them.

What happens when you add vinegar to Baking Soda?

Draw:

What happens when you add vinegar to Cornstarch?

Draw:

What happened when vinegar was added to the mystery white powder?

What powder is the mystery white powder?
White Powder and Goop Analysis

Goop
Traces of glue were found on the envelope. The lab says the glue was either Magic Paste or Gloppy Glue. Are there any differences between the liquids?

Since we can't tell the difference between the two glues visually, we will use the different viscosities of the glue to determine which glue was used. Viscosity is a measure of how well a liquid flows. High viscosity liquids, like maple syrup, flow slowly. Low viscosity liquids, like water, flow quickly. Can you think of two liquids with low viscosity, and one with high viscosity?

High viscosity liquid: ________________________________________________________

Low viscosity liquids: _______________________________________________________

One way to measure viscosity is to see how quickly an object can move through the liquid. In a high viscosity liquid the object will move more slowly than in a low viscosity liquid. Time how long it takes a glass ball to fall completely through each liquid, and then write your answers below.

<table>
<thead>
<tr>
<th>Glue</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magic Paste</td>
<td></td>
</tr>
<tr>
<td>Gloppy Glue</td>
<td></td>
</tr>
</tbody>
</table>
Which glue has a higher viscosity? 

Which suspects were carrying high viscosity glue? 

Which were carrying low viscosity glue? 

After the evidence from the lab comes in you will know if the glue used on the letter was high viscosity or low viscosity. 

Which glue was used on the letter? 

Now that you have this new evidence, who could have written the letter?