Part 2: The Penny Drop Lab

Background
As learned from the introductory activity, good chemistry must follow certain standards which have been agreed upon by the scientific community. Early in your science experiences, the Scientific Method was introduced as consisting of Question, Hypothesis, Procedure, and Conclusion. Today, you will perform the following lab using the Scientific Method.

Materials
- 1 penny
- Pipet
- 50 mL beaker
- Water

Safety
- Always wear safety goggles when handling chemicals in the lab.
- Wash your hands thoroughly before leaving the lab.
- Follow your teacher’s instructions for how to clean up your materials upon completion.

Problem
How many drops of water can a penny hold?

Hypothesis
Write your own hypothesis below in the format of an “If, then” statement.

Procedure
1. Obtain a penny, a 50 mL beaker, and a pipet.
2. Fill the beaker half full with water.
3. Using the pipet, draw water from the beaker.
4. Place the pipet very close to the penny, and release water slowly, drop by drop onto the surface of the penny.
5. Count the number of drops of water the penny can hold until water spills from the surface of the penny.
6. Record the number of drops in the data table below.
7. Repeat this process two more times.
8. Sketch the view from the top of the penny and from the side of the penny when it is holding water in the observation data table below.
Data

<table>
<thead>
<tr>
<th>Trial #</th>
<th># of Drops on Penny</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Avg</td>
<td></td>
</tr>
</tbody>
</table>

Observations

Draw pictures of the penny holding the water:

<table>
<thead>
<tr>
<th>Top view</th>
<th>Side View</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analysis

1. Share your average value with the teacher. Compare the average values from your entire class on the board. Using the terms *control* and *variable*, provide an explanation as to why the values from each lab group may or may not be the same.

2. Did your penny hold more, less, or exactly the amount of water you predicted?

3. Identify at least three variables in this experiment.

4. How many controls should be used in a lab? How many variables in a lab?
5. Why did the penny hold as much water as it did? Refer to the article read earlier in class about water marbles.

6. Provide three reasons as to why this laboratory is consistent with chemistry fact and not chemistry fiction.

**Conclusion**
Make a conclusion statement based on the procedure you completed today. Remember to include the following three components in your conclusion:

1) Restate the hypothesis—can be copied;
2) Make a statement about what was found/learned from the experiment relating to the hypothesis);
3) Include data to support your statement.