Name: ______________________

**Part 2: Acid Rain Simulation**

**Background**
Acid rain and vinegar have similar pH values. Over the next week you will observe and record the effect that vinegar has on an egg shell.

**Materials**
- 25 ml vinegar
- One uncooked egg
- Glass container with lid
- pH paper with pH chart
- Graduated cylinder
- Small paint brush

**Safety**
- Always wear safety goggles when handling chemicals in the lab.
- Wash your hands thoroughly before leaving the lab.
- Follow the teacher’s instructions for cleanup of materials and disposal of chemicals.
- When working with acids, if any solution gets on your skin immediately rinse the area with water.

**Procedure**
1. Carefully place a single egg inside one of the glass containers.
2. Record your qualitative observations about the egg shell in the data table (color, hardness, etc.)
4. Pour all the vinegar onto the egg in the jar. Using the paint brush, apply the vinegar to the shell of the egg, so that the entire surface has been saturated with vinegar.
5. Touch the paint brush to a strip of pH paper. Compare the color change with the pH color chart. Record the pH value in the data table.
6. Seal the jar with the lid, and place the jar in a safe place.
7. After 24 hours return to the jar.
8. Remove the lid, and dip your paint brush in the jar and touch it to a new piece of pH paper. Record this value in your data table.
9. Again record your qualitative observations about the egg shell in the data table, specify color, hardness, etc. Wear gloves if you remove the egg from the jar.
10. Seal the jar with a lid, and place the jar in a safe place.
11. Repeat steps 7-9 several times during a week (complete 3-4 observations after the first day).
12. After a week, wearing gloves remove the egg from the jar and gently rinse the egg with water. Record your final observations.
Observations

<table>
<thead>
<tr>
<th>Observation</th>
<th>pH value</th>
<th>Qualitative Observations</th>
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</thead>
<tbody>
<tr>
<td>Initial (Day 1)</td>
<td></td>
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<td>Second (Day __)</td>
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<td>Third (Day __)</td>
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<td>Fourth (Day __)</td>
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<td>Final (Day 7)</td>
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Analysis

1. How does the pH of vinegar compare with the average pH of acid rain? Refer to your webquest if needed.

2. What indicators of chemical change did you observe on the egg shell during the week trial?

3. Research to find out what the main chemical component of an egg shell is. Record its chemical name and chemical formula.
4. Research to find out what the acid in vinegar is called. Record its chemical name and chemical formula.

5. What kind of reaction took place between the egg shell and the vinegar?

**Conclusion**
What other materials contain the same chemical as the one found in egg shells? Reflect on the egg and vinegar reaction, why was this done, and how was it helpful as you learned about acid rain?