There are TEN questions, all of equal value. Please write a maximum of ONE SENTENCE (20 words) for each answer.

In the Pepsi Challenge, a researcher pours Coke and Pepsi out of bottles into separate cups, and gives them to a blindfolded subject (in random order). The subject says which drink he or she prefers, and the researcher tells him or her whether their preferred drink was Coke or Pepsi. The researcher repeats for a large number of subjects. The researcher wishes to determine whether more people prefer Coke or more prefer Pepsi.

1. **Is the study experimental or observational?**

2. **What sources of bias, if any, are there?**

3. **How could the study be improved?**

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300 dandruff sufferers take part in a study of a new anti-dandruff shampoo. The object is to determine whether the anti-dandruff shampoo is effective in reducing dandruff. Each subject is randomly assigned into one of three groups.

- Each person in Group 1 receives no shampoo and is instructed to wash their hair every day for a week.
- Each person in Group 2 receives a normal shampoo (physically indistinguishable from the anti-dandruff shampoo) and is instructed to wash their hair with it every day for a week.
- Each person in Group 3 receives the anti-dandruff shampoo and is instructed to wash their hair with it every day for a week.
At the end of the week, they report whether there is an improvement in their dandruff or not. Neither the subjects nor the researchers know whether the shampoo given to a person is anti-dandruff or normal until after they submit their results.

The results:

<table>
<thead>
<tr>
<th>Group</th>
<th>Improved</th>
<th>Did not improve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>Group 2</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Group 3</td>
<td>80</td>
<td>20</td>
</tr>
</tbody>
</table>

4. Which is the treatment group?

5. Which is the most appropriate control group?

6. Is the study experimental or observational?

7. Is the study randomised?

8. Why is there a difference between Groups 1 and 2?

9. Is there a confounding factor between the appropriate treatment and control groups? If you, name one.

10. Does the study prove that the anti-dandruff shampoo works?