

Directions: Read this passage and use it to answer the questions below.

(1) A student decides to design an experiment because he is unsure whether or not caffeine will improve student test scores. (2) He predicts that the caffeine will improve their test scores. (3) He thinks this because people seem to consume caffeinated beverages like coffee when they need to be alert and focused. (4) To test this, he will give the same test to two groups of people. One group of 6 will consume a cup of coffee before they take the test; (5) the other group of 6 will consume the same volume of plain tap water with no caffeine. (6) He will measure the average test scores to determine whether or not the caffeine made an impact.

1. What is the hypothesis?
2. What is the research question?
3. What is the rationale?
4. What is the independent variable(s)?
5. What is the dependent variable(s)?
6. Would it be ok if they gave different amounts of caffeine to different people, or should everyone who gets caffeine always get the same amount of caffeine? Explain.
7. How detailed should the materials and methods section of any experiment be? Why is this level of detail needed?
8. Why did some of the people get only water and no caffeine or coffee? Is this necessary? Why or why not?
9. What are the sample sizes and number of trials in this experiment? How does this affect the validity and reliability of the data?
10. How could this experiment be improved and why would this be helpful?