

**THE NATURE OF SCIENCE**

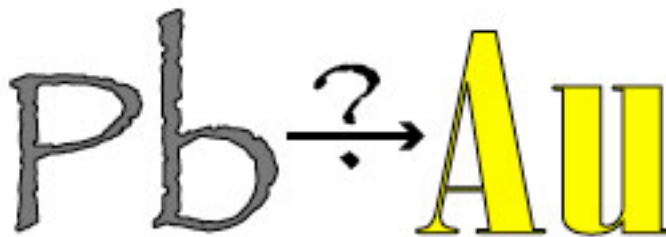
## Additional FCAT Practice Questions

Directions: Select the best answer for each of the following questions

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1. Many people believe alchemy to have been a dishonest pursuit of turning lead into gold during ancient times.



While many alchemists were indeed misguided, dishonest or misinformed, the art of alchemy also passed along many important ideas, techniques and processes that are still used in science today. What concept does alchemy illustrate when referring to the nature of science?

- A. By following the scientific method, magical actions will sometimes occur that make us rich.
- B. By sharing only some of the truth some of the time, it is often possible to confuse people and benefit from their bewilderment.
- C. It is often best to abandon work that is too different or unpopular. It is better to simply accept what has already been stated by the experts.
- D. As new information is gathered and compared to previous work, our knowledge may increase and new theories can be developed.

2. A group concerned with public wellbeing recently rated the performance of several brands and models of child car seats on their website.



The test results were prominently published, and the materials, methods and data collected were all available to viewers of the website. Why was it important for the website to show all of this information?

- A. By showing all of this information, the group made sure that no one would do the same test or experimental methods.
- B. To maintain credibility all scientific investigations should keep accurate records, be open to investigation, and be repeatable to ensure accuracy.
- C. According to the law, any experiments done on actual people must publish all of their materials, methods and results on the Internet.
- D. By publishing the results, the group testing the car seats is not legally responsible for any mistakes that might have been made during the experiment.

3. In order to test the process of hydroponics (growing plants in a nutrient-rich solution instead of soil), several watercress plants were placed in solutions that contained different amounts of a nutrient.



The plants were then observed and measured every day for growth. What should be done to ensure that the results of this experiment are valid?

- A. The same nutrient should be used in the solutions, but the amount of the nutrient should be changed.
- B. Different nutrients should be used in each solution, and the amount of each nutrient should be changed.
- C. Each plant should be placed under different sources of light, such as sunlight, incandescent light bulbs and fluorescent lights.
- D. Different types of watercress should be used to ensure that every type of growth is observed.

4. The school cafeteria asked several grade 8 science classes to design experiments to determine what recipe would produce the most popular 'health bar' for students to have as a snack during the school day. Variables to be tested included the size and shape of the bar, the amount of peanut butter in the ingredients, and the color of the wrapper the bars are sold in.

Why should each science class collect health information from their subjects, including information about allergies, before allowing the tests to begin?

- A. Since the experiment will be repeated many times for validity, only certain people should be asked to eat several bars over a relatively short period of time.
- B. Only students who do not eat breakfast should be included in the study, since they are usually hungrier than those who do eat breakfast in the morning.
- C. Students who often eat chocolate bars have more experience than those who do not, and it would be better to have subjects who are more knowledgeable.
- D. Some students may be allergic to peanuts, and could have serious reactions to the ingredients.

5. A team of scientists recently claimed that they had discovered a method of controlling 'cold fusion', a process that produces energy by combining two nuclei of different atoms in a stable, room temperature environment. This would allow the creation of energy at very low cost in a wide range of environments. A technology discovery such as this would radically change many aspects of our society, both economically and environmentally.

What would be the most likely response of the scientific community to a new, exciting and controversial claim such as this?

- A. Scientists would ignore the results unless the experiment was published in one of the most popular science magazines.
- B. Scientists would discuss whether this type of technology was good for society, and would decide if anyone should be told of the results.
- C. Scientists would attempt to patent the process of cold fusion before anyone else could make money from it.
- D. Scientists would ask to see notes on all of the work that was completed, which they would check for accuracy, and then they would attempt to repeat the research and obtain the same results.

## Answers

1. D
2. B
3. A
4. D
5. D