

TRUE AND FALSE: Circle the Correct Answer: 2 pts. each

- T     F     1. A theory is an educated guess about the answer to a scientific question.
- T     F     2. An extensive collection of information that includes well-tested and verified hypotheses about certain aspects of the natural world is known as a scientific theory.
- T     F     3. When scientific findings are expressed mathematically, they are harder to verify or disprove by experiment.
- T     F     4. A scientific fact is something that has been tested over and over as accurate but can be changed if disproved.
- T     F     5. A hypothesis is scientific if there exists a test for proving it wrong.

MULTIPLE CHOICE: Choose the best answer to each question and write the appropriate letter in the space provided. 2 pts. each

- \_\_\_\_\_ 6. Physics is the most fundamental science because:
- You can better understand science in general if you understand physics
  - Underneath biology is chemistry, and underneath chemistry is physics
  - The ideas of physics extend into more complex sciences
  - All of the above
- \_\_\_\_\_ 7. Which one of the following steps is NOT part of a scientific method?
- Formulate a general rule based on the predictions and experimental outcome
  - Repeat the experiments until the answers match the predictions
  - Perform experiments to test the predictions
  - Guess the answer and predict its consequences
- \_\_\_\_\_ 8. A scientific fact is:
- A guess that has been tested over and over again and always found to be true
  - Close agreement by competent observers of observations of the same phenomena
  - A synthesis of a collection of data that includes well-tested guesses.
  - An educated guess that has yet to be proven by experiment
- \_\_\_\_\_ 9. A hypothesis is:
- A guess that has been tested over and over again and always found to be true
  - Close agreement by competent observers of observations of the same phenomena
  - A synthesis of a collection of data that includes well-tested guesses.
  - An educated guess that has yet to be proven by experiment

- \_\_\_\_\_ 10. A theory is:
- A guess that has been tested over and over again and always found to be true
  - Close agreement by competent observers of observations of the same phenomena
  - A synthesis of a collection of data that includes well-tested guesses.
  - An educated guess that has yet to be proven by experiment
- \_\_\_\_\_ 11. Which of these is a scientific hypothesis?
- An unseen second universe surrounds the universe.
  - Atoms are the smallest particles of matter that exist
  - Albert Einstein is the greatest Physicist of the twentieth century.
- \_\_\_\_\_ 12. Which of the following statements is not true?
- Technology is a method of solving practical problems
  - Science is a method of answering theoretical questions
  - Science, not technology, excludes the human factor
  - Both science and technology exclude the human factor
- \_\_\_\_\_ 13. Which one of the following problems would NOT be a part of physics?
- Identifying all the bones in a human body
  - Identifying all forces acting on a person who is walking uphill
  - Calculating the instantaneous velocity of an accelerating car
  - Calculating the average density of a person
- \_\_\_\_\_ 14. To test a scientific hypothesis, you would:
- Set up many experiments and look at the results
  - Set up one experiment and look at the results
  - Use the results of only the experiments that confirm the hypothesis
  - Find the best result and report only that result
- \_\_\_\_\_ 15. The difference between a hypothesis and a theory is that a hypothesis:
- Is a guess that has not been well-tested, whereas the theory uses well-tested and verified guesses.
  - Is testable, whereas a theory is not testable.
  - Is not testable, whereas a theory is testable
  - Can be revised, whereas a theory cannot be revised.

SHORT ANSWER: In the space below, complete the following question(s). 10 pts.

16. Write a short paragraph about the scientific method. i.e., list the steps and describe each.

SCIENTIFIC NOTATION PROBLEMS: Convert the following number into scientific notation 2 pts each.

17. 92.03 \_\_\_\_\_

18. 6730 \_\_\_\_\_

Convert the following numbers into standard notation: 2 pts. each

19.  $4.391 \times 10^{-3}$  \_\_\_\_\_

20.  $6.825 \times 10^2$  \_\_\_\_\_

CONVERSION PROBLEMS: Show your work in converting the following 5 pts. each

21. How many minutes are there in 1 year?

22. How many feet are in 500 meters?