

Quiz 1 Key  
BI-102-2, Fall '06, Dr. C. S. Tritt

1. What is the fundamental purpose of a well designed scientific experiment?

To provide evidence (data) that supports or refutes a hypothesis. Elimination of alternative hypotheses also accepted. I accepted prove or disprove a hypothesis, but keep in mind that its generally very hard to prove a hypothesis is true. I also accepted “test” a hypothesis, but it would be better to say “support or refute.” Just saying “support” a hypothesis was too narrow (-5).

2. Describe a modern type of evidence that is generally accepted as supporting Darwin’s hypothesis of evolution by inheritance and natural selection.

For full credit, answers had to make clear how the evidence supported the theory. Carbon dating is generally not correct (it does span enough time).

Fossil Record – Intermediate forms found. Evidence of sequential change.

Age of Earth – Radiometric methods show the Earth is very old (4 billion) years so there has been time of evolutionary change.

Mechanism of Heredity (modern genetics) – Traits are passed to offspring such that offspring are unique but similar to parents.

Comparative Anatomy – The same structures (particularly bones) can be found having different functions in different species.

Developmental sequences (not in book) – Early in development certain metabolic reactions and anatomic structures seem to mimic ancestral forms.

Molecular Evidence (DNA) including genetic (molecular) clocks – Animals that seem to differ greatly based on appearance, history or geography also differ greatly genetically.

Comparison of molecular and fossil phylogenetic trees – Genetic changes can be tracked in consistent ways among species known to share common ancestors.

3. Explain why Dr. Tritt thinks the periodic table of the elements is so cool (besides the oblivious fact that he’s a complete geek).

Because it organized of many previous unrelated observations.

4. Provide concise technical definitions of the terms “oxidation” and “reduction.”

Oxidation is the loss of an electron, while reduction the gain of an electron. Saying the result is charged (positive or negative) is incorrect (-10).

5. Explain why the bicarbonate buffer system is of such interest in biology.

It provides a mechanism by which plasma pH can be maintained via respiratory changes. Must say something about plasma (or body) pH and respiratory (or lung) changes for full credit (-5 if either is missing). Describing buffers in general was only worth 5 points.