

Learning Targets: Unit Three – The Nature of Science

When providing the best possible answer to the following questions please apply all learned scientific techniques and procedures, do not use abbreviations, use proper scientific terminology, show work for all mathematical calculations, use all significant figure and scientific notation rules, apply appropriate writing strategies (Claim, Evidence, Reasoning), provide definitions of terms used in writing, and note that at all times spelling counts. Your ability to meet these and all established classroom expectations, including labeling of BINs, providing heading information, and your ability to follow directions may be included in computation of grade.

Instructions: This is a list of topics covered in Unit Two. You should treat this like a checklist. The bolded items are standards defined by Kentucky of Education to be taught in High School Biology. The items in italics connect these standards to our specific course work. You should have complete understanding and knowledge of these items and be able to apply them to problems/tasks. Although it may help you to write out answers and explanations to the listed items it is not required.

- Demonstrate organizational skills such as keeping a daily calendar of assignments and activities and maintaining a notebook of class work.
 - *Keep your binder organized and updated.*
- Apply strategies before, during, and after reading to increase fluency and comprehension (e.g., adjusting purpose, previewing, scanning, making predictions, comparing, inferring, summarizing, using graphic organizers) with increasingly challenging texts.
 - *Use graphic organizers to better understand the parts of a scientific experiment and the accepted research methods.*
 - *Improve understanding of material by outlining material presented in class.*
- Apply active reading, listening, and viewing techniques by taking notes on classroom discussions, lectures, oral and/or video presentations, or assigned at-home reading, and by underlining key passages and writing comments in journals or in margins of texts, where permitted.
 - *Stay on task during class, annotate provided PowerPoint notes and take additional notes during board discussions.*
 - *Outline provided materials and assimilate this information into material presented in class.*
- Apply knowledge of Greek, Latin, and Anglo-Saxon affixes, inflections, and roots to understand unfamiliar words and new subject area vocabulary in increasingly challenging texts.
 - *Be able to define and correctly spell all vocabulary words.*
- Actively participate in small-group and large-group discussions, assuming various roles.
 - *Participate in class discussions and ask questions when needed on a daily basis.*
- Describe the fundamental assumptions of science.
- Manipulate variables in experiments using appropriate procedures (e.g. controls, multiple trials).
 - *Be able to correctly write a specific and testable hypothesis.*
 - *Differentiate between control group and experimental group.*
 - *Differentiate between constants, independent variable and dependent variable.*

- Collect, organize, and analyze data accurately and precisely (e.g. using scientific techniques and mathematics in experiments)
 - *Differentiate between observations and inferences.*
 - *Differentiate between qualitative and quantitative data.*
 - *Understand the concept of statistics and how they should be represented in science.*
- Interpret results and draw conclusions, revising hypothesis as necessary and/or formulating additional questions or explanations.
 - *Differentiate between inductive and deductive reasoning.*
- Recognize and apply the criteria that scientists use to evaluate the validity of scientific claims and theories.
 - *Understand the scientific concept of a theory and some historic examples of scientific theories.*
- Explain why scientific explanations must meet certain criteria (e.g. be consistent with experimental/observational evidence about nature, be open to critique and modification, be subject to peer review, use ethical reporting methods and procedures.)
- Explain why all scientific knowledge is subject to change as new evidence becomes available to the scientific community.
- Distinguish between fact and opinion, basing judgments on evidence and reasoning.
- Use a variety of appropriate sources (e.g. Internet, scientific journals) to retrieve relevant information; cite references properly.
 - *Know how to evaluate a web site for accuracy, objectivity, and authority*
- Revise, refine, and proofread own and other's writing, using appropriate tools to find strengths and weaknesses and to seek strategies for improvement (using good writing methods).
- Write and speak effectively to present and explain scientific results, using appropriate terminology and graphics.
- Use appropriate essay-test taking and timed-writing strategies that address and analyze the questions.
- Demonstrate familiarity with test formats and test administration procedures to increase speed and accuracy.
 - *Complete tests within permitted time limits.*