

Biology

Expectation	<i>Module, PLT activity</i>
Science as Inquiry	
The Abilities to Do Scientific Inquiry	
1. Write a testable question or hypothesis when given a topic (SI-H-A1)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants Municipal Solid Waste, Composting</i>
2. Describe how investigations can be observation, description, literature survey, classification, or experimentation (SI-H-A2)	
3. Plan and record step-by-step procedures for a valid investigation, select equipment and materials, and identify variables and controls (SI-H-A2)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants Municipal Solid Waste, Composting</i>
4. Conduct an investigation that includes multiple trials and record, organize, and display data appropriately (SI-H-A2)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants Municipal Solid Waste, Composting</i>
5. Utilize mathematics, organizational tools, and graphing skills to solve problems (SI-H-A3)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants Municipal Solid Waste, Composting</i>
6. Use technology when appropriate to enhance laboratory investigations and presentations of findings (SI-H-A3)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants Municipal Solid Waste, Composting</i>
7. Choose appropriate models to explain scientific knowledge or experimental results (e.g., objects, mathematical relationships, plans, schemes, examples, role-playing, computer simulations) (SI-H-A4)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants Municipal Solid Waste, Composting</i>
8. Give an example of how new scientific data can cause an existing scientific explanation to be supported, revised, or rejected (SI-H-A5)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants Municipal Solid Waste, Composting</i>
9. Write and defend a conclusion based on logical analysis of experimental data (SI-H-A6) (SI-H-A2)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants Municipal Solid Waste, Composting</i>
10. Given a description of an experiment, identify appropriate safety measures (SI-H-A7)	
Understanding Scientific Inquiry	
11. Evaluate selected theories based on supporting scientific evidence (SI-H-B1)	<i>Focus on Forests, Old-Growth Forests Focus on Forests, Tough Choices Focus on Forests, Squirrels vs. Scopes Forest Ecology, Home Sweet Home Forest Ecology, Saga of the Gypsy Moth Forest Ecology, Fire Management Focus on Risk, Electromagnetic Fields Focus on Risk, Chlorine: Looking at Tradeoffs</i>
12. Cite evidence that scientific investigations are conducted for many different reasons (SI-H-B2)	<i>Focus on Forests, Old-Growth Forests Focus on Forests, Tough Choices Focus on Forests, Squirrels vs. Scopes Forest Ecology, Home Sweet Home Forest Ecology, Saga of the Gypsy Moth Forest Ecology, Fire Management Focus on Risk, Electromagnetic Fields Focus on Risk, Chlorine: Looking at Tradeoffs</i>

13. Identify scientific evidence that has caused modifications in previously accepted theories (SI-H-B2)	<i>Focus on Forests, Old-Growth Forests</i> <i>Focus on Forests, Tough Choices</i> <i>Focus on Forests, Squirrels vs. Scopes</i> <i>Forest Ecology, Home Sweet Home</i> <i>Forest Ecology, Saga of the Gypsy Moth</i> <i>Forest Ecology, Fire Management</i> <i>Focus on Risk, Electromagnetic Fields</i> <i>Focus on Risk, Chlorine: Looking at Tradeoffs</i>
14. Cite examples of scientific advances and emerging technologies and how they affect society (e.g., MRI, DNA in forensics) (SI-H-B3)	<i>Focus on Forests, Tough Choices</i> <i>Forest Ecology, Saga of the Gypsy Moth</i> <i>Forest Ecology, Fire Management</i> <i>Focus on Risk, Electromagnetic Fields</i> <i>Focus on Risk, Chlorine: Looking at Tradeoffs</i>
15. Analyze the conclusion from an investigation by using data to determine its validity (SI-H-B4)	<i>Focus on Forests, Old Growth Forests</i> <i>Focus on Forests, Squirrels vs. Scopes</i> <i>Forest Ecology, Understanding Fire</i> <i>Focus on Risk, Electromagnetic Fields</i> <i>Focus on Risk, Chlorine-Looking at Tradeoffs</i>
16. Use the following rules of evidence to examine experimental results: (a) Can an expert's technique or theory be tested, has it been tested, or is it simply a subjective, conclusive approach that cannot be reasonably assessed for reliability? (b) Has the technique or theory been subjected to peer review and publication? (c) What is the known or potential rate of error of the technique or theory when applied? (d) Were standards and controls applied and maintained? (e) Has the technique or theory been generally accepted in the scientific community? (SI-H-B5) (SI-H-B1) (SI-H-B4)	<i>Focus on Forests, Old Growth Forests</i> <i>Focus on Forests, Squirrels vs. Scopes</i> <i>Forest Ecology, Understanding Fire</i> <i>Forests of the World, Seeking Sustainability</i> <i>Focus on Risk, Electromagnetic Fields</i> <i>Focus on Risk, Chlorine-Looking at Tradeoffs</i>

Life Science
The Cell

1. Compare prokaryotic and eukaryotic cells (LS-H-A1)	
2. Identify and describe structural and functional differences among organelles (LS-H-A1)	
3. Investigate and describe the role of enzymes in the function of a cell (LS-H-A1)	
4. Compare active and passive cellular transport (LS-H-A2)	
5. Analyze the movement of water across a cell membrane in hypotonic, isotonic, and hypertonic solutions (LS-H-A2)	
6. Analyze a diagram of a developing zygote to determine when cell differentiation occurs (LS-H-A3)	

The Molecular Basis of Heredity

7. Identify the basic structure and function of nucleic acids (e.g., DNA, RNA) (LS-H-B1)	
8. Describe the relationships among DNA, genes, chromosomes, and proteins (LS-H-B1)	<i>Focus on Forests, Squirrels vs. Scopes</i>
9. Compare mitosis and meiosis (LS-H-B2)	
10. Analyze pedigrees to identify patterns of inheritance for common genetic disorders (LS-H-B3)	
11. Calculate the probability of genotypes and phenotypes of offspring given the parental	

genotypes (LS-H-B3)	
12. Describe the processes used in modern biotechnology related to genetic engineering (LS-H-B4) (LS-H-B1)	
13. Identify possible positive and negative effects of advances in biotechnology (LS-H-B4) (LS-H-B1)	
Biological Evolution	
14. Analyze evidence on biological evolution, utilizing descriptions of existing investigations, computer models, and fossil records (LS-H-C1)	
15. Compare the embryological development of animals in different phyla (LS-H-C1) (LS-H-A3)	
16. Explain how DNA evidence and fossil records support Darwin's theory of evolution (LS-H-C2)	
17. Explain how factors affect gene frequency in a population over time (LS-H-C3)	<i>Focus on Forests, Squirrels vs. Scopes</i>
18. Classify organisms from different kingdoms at several taxonomic levels, using a dichotomous key (LS-H-C4)	
19. Compare characteristics of the major kingdoms (LS-H-C5)	
20. Analyze differences in life cycles of selected organisms in each of the kingdoms (LS-H-C6)	
21. Compare the structures, functions, and cycles of viruses to those of cells (LS-H-C7)	
22. Describe the role of viruses in causing diseases and conditions (e.g., AIDS, common colds, smallpox, influenza, warts) (LS-H-C7) (LS-H-G2)	
Interdependence of Organisms	
23. Illustrate the flow of carbon, nitrogen, and water through an ecosystem (LS-H-D1) (SE-H-A6)	<i>Forest Ecology, Cast of Thousands Municipal Solid Waste, Composting</i>
24. Analyze food webs by predicting the impact of the loss or gain of an organism (LS-H-D2)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, Home Sweet Home Forest Ecology, Saga of the Gypsy Moth</i>
25. Evaluate the efficiency of the flow of energy and matter through a food chain/pyramid (LS-H-D2)	<i>Forest Ecology, Adopt a Forest Municipal Solid Waste, Composting</i>
26. Analyze the dynamics of a population with and without limiting factors (LS-H-D3)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, Home Sweet Home Forest Ecology, Saga of the Gypsy Moth Forest Ecology, Story of Succession Focus on Forests, Squirrels vs. Scopes</i>
27. Analyze positive and negative effects of human actions on ecosystems (LS-H-D4) (SE-H-A7)	<i>Forest Ecology, all activities in the module Focus on Forests, Squirrels vs. Scopes Municipal Solid Waste, Landfills Forests of the World, Analyzing Patterns of Forest Change Forests of the World, Understanding the Effects of Forest Uses Forests of the World, Seeking Sustainability: A Global Response Places We Live, Far-Reaching Decisions Places We Live, Regional Community Issues: The Ogallala Aquifer Focus on Risk, Decision Making</i>

Matter, Energy, and Organization of Living Systems

28. Explain why ecosystems require a continuous input of energy from the Sun (LS-H-E1)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Municipal Solid Waste, Composting</i>
29. Use balanced equations to analyze the relationship between photosynthesis and cellular respiration (LS-H-E1)	<i>Forest Ecology, Cast of Thousands</i>
30. Explain the role of adenosine triphosphate (ATP) in a cell (LS-H-E2)	
31. Compare the levels of organization in the biosphere (LS-H-E3)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, Story of Succession Forest Ecology, Understanding Fire Forest Ecology, Fire Management Municipal Solid Waste, Composting</i>

Systems and the Behavior of Organisms

32. Analyze the interrelationships of organs in major systems (LS-H-F1) (LS-H-E3)	
33. Compare structure to function of organs in a variety of organisms (LS-H-F1)	
34. Explain how body systems maintain homeostasis (LS-H-F2)	
35. Explain how selected organisms respond to a variety of stimuli (LS-H-F3)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, The Nature of Plants</i>
36. Explain how behavior affects the survival of species (LS-H-F4)	<i>Forest Ecology, Adopt a Forest Forest Ecology, Cast of Thousands Forest Ecology, Home Sweet Home Forest Ecology, Saga of the Gypsy Moth Forest Ecology, Understanding Fire Forest Ecology, Fire Management Focus on Forests, Squirrels vs. Scopes</i>

Personal and Community Health

37. Explain how fitness and health maintenance can result in a longer human life span (LS-H-G1)	
38. Discuss mechanisms of disease transmission and processes of infection (LS-H-G2) (LS-H-G4)	<i>Focus on Risk, Risk Assessment: Tools of the Trade Focus on Risk, Chlorine: Looking at Tradeoffs</i>
39. Compare the functions of the basic components of the human immune system (LS-H-G3)	
40. Determine the relationship between vaccination and immunity (LS-H-G3)	
41. Describe causes, symptoms, treatments, and preventions of major communicable and noncommunicable diseases (LS-H-G4)	
42. Summarize the uses of selected technological developments related to the prevention, diagnosis, and treatment of diseases or disorders (LS-H-G5)	<i>Focus on Risk, Risk Assessment: Tools of the Trade Focus on Risk, Chlorine: Looking at Tradeoffs</i>