

Irving Independent School District
Instructional Guide
Biology
Grade 9, 10, or 11

<i>Performance Indicator</i>	<i>Teaching Strategy</i>	<i>Resources</i>	<i>TEKS/ TAAS</i>	<i>Sample Assessment</i>
On Going				
1. Demonstrate safe practices during field and laboratory investigations.	<ul style="list-style-type: none"> ◆ Safety Lab, Worksheets ◆ <u>Demo-Equipment Disposal</u> 	<ul style="list-style-type: none"> ◆ ABCD Curriculum ◆ Addendum ◆ Current Adopted Textbook ◆ Project Wild (Include these throughout the document) 	4 1(A)	<ul style="list-style-type: none"> ◆ Which of the following is dangerous in the laboratory? <ul style="list-style-type: none"> a. leaving a lighted Bunsen burner unattended b. using glassware such as beakers and flasks c. pointing a heated test tube away from yourself d. not wearing safety goggles when graphing data ◆ Set up various lab stations with “problems” for students to evaluate. Items such as chemicals, hazardous and nonhazardous, broken glass, dissection specimens and tools, paper, lab manuals/instruction sheets, etc. Identify both the safe and the unsafe elements of each station. <ul style="list-style-type: none"> a. Slice a piece of cork. Which direction does one slice? b. How does one dispose of a broken test tube? c. How should hot glassware be handled? ◆ SAFETY TEST

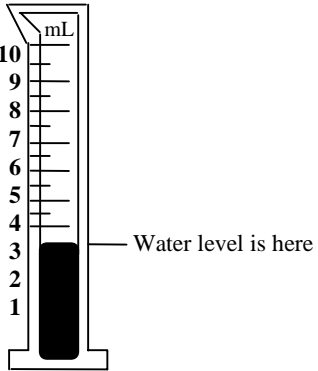
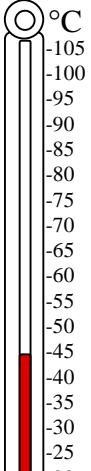
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2. Make wise choices in the use and conservation of resources and the disposal or recycling of materials.	<ul style="list-style-type: none"> ◆ Identify biodegradable items (those that change within a few hours in water) i.e., banana peel, paper, foil, Styrofoam. Tie these to packaging issues. ◆ In any given lab discuss the use of which equipment and materials were used and in what quantities. Suggest means of making the lab more environmentally friendly. 		3.4 1(B)	<ul style="list-style-type: none"> ◆ Which of the following would be the correct procedure to follow if you have finished a lab using dangerous chemicals? <ul style="list-style-type: none"> a. Carefully fill any containers that have chemicals in them with water until they are diluted and then wash them down the sink. b. Put all the chemicals together so that they are easy to dispose of. c. Wash the containers as you would in a normal lab. d. Give the chemicals to your teacher so that she/he can dispose of them. ◆ <u>Student Groups</u> - Write/perform skit for class from teacher assigned topics. Non-performing students must explain why procedures are correct or incorrect.

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3. Plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology.	<ul style="list-style-type: none"> ◆ <i>Investigative procedures should be implemented throughout the school year in each lab.</i> ◆ Given four, 2-liter bottles, dry soil, a light source, and water; design a test to observe the impact of the greenhouse effect on global warming. ◆ In a laboratory experiment determine what antibiotic or household chemical is 		4, 5, 6, 7 2(A)	<ul style="list-style-type: none"> ◆ Science is based on the objective, careful observation of nature. People who work in science follow the research method, which is a logical process that involves observation, formation of hypotheses, and experimentation. Consider how the scientific method was carried out in the following example. A scientist observed that tobacco plants flower only at certain times of the year. After careful consideration of this phenomenon, the scientist conducted an experiment. She grew five tobacco plants and exposed each to a specific amount of daily light. Study the diagrams below, which show the result of this experiment. Then complete the question which follows. ◆ 1. What is the variable in this experiment? <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Hours of Daylight:</p> <p>10 hours 12 hours 14 hours 16 hours 18 hours</p> </div>

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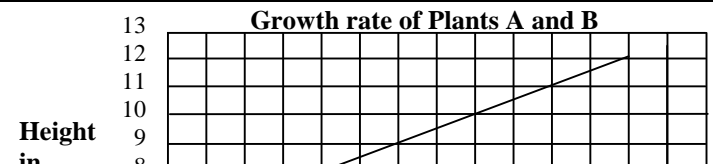
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	<p>most effective at limiting bacterial growth? (camphophenique, Lysol, 4-0-9, etc.)</p>			<p>a. nutrients b. fertilizer c. water d. light</p>
On Going				
<p>4. Collect data and make measurements with precision.</p>	<ul style="list-style-type: none"> ◆ Introductory lab activity including measuring, weighing, graphing, charts and tables. ◆ <i>Include in all labs when possible</i> 		<p>5 2(B)</p>	<div style="display: flex; justify-content: space-around; align-items: center;">   </div>

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				<ul style="list-style-type: none"> ◆ What is the volume of the cylinder above? <ul style="list-style-type: none"> a. 2.0 mL b. 3.0 mL c. 3.5 mL d. 4.0 mL ◆ What is the temperature of the thermometer in Celsius? <ul style="list-style-type: none"> a. 28° b. 30° c. 33° d. 40 ◆ The numbers on the metric ruler below represent centimeters. What unit of measurement do the smaller lines in between the numbers stand for? <ul style="list-style-type: none"> a. kilometers b. meters c. decimeters d. millimeters ◆ <u>Lab Practical</u>: using various measuring devices, collecting data and graphing

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On Going				In all labs, students will organize, make inferences, and predict trends from “collected data”.
5. Organize, analyze,	◆ Having collected data		6, 7	◆ Use the pictures and graph to answer the following questions.



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<p>evaluate, make inferences, and predict trends from data.</p>	<p>from Teaching Strategies in PI. 4, students create their own data tables from gathered information.</p> <p>a. Write descriptions that explain changes between data points.</p> <p>b. Write descriptions of trends or patterns in line graphs.</p> <p>◆ <i>Include in all labs when possible.</i></p>		2(C)	<p>Days</p> <p>According to the graph, which plant is growing at a faster rate?</p>

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				<ul style="list-style-type: none"> a. plant A b. plant B ◆ How tall was plant B when plant A was 9 cm tall? a. 7 cm b. 9 cm c. 7.5 cm d. 12 cm ◆ What was the variable being tested in the experiment? a. the amount of water being given to the plants b. the temperature the plants were being kept at c. the amount of light each plant received d. 5th kind of plant that was being grown.

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On Going														
6. Communicate valid conclusions.	<ul style="list-style-type: none"> ◆ In one or two sentences, justify your answer from data tables in PI 5. a. Show a valid connection between the numbers on a graph and the trend stated. b. Examine your hypothesis in light of data collected and inferences from the graph to determine its validity. c. Check for design flaws in an investigation. ◆ <i>Include in all labs when</i> 		7 2(D)	<p>HYPOTHESIS: The number of spots on a ladybug increase as the ladybug gets older.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" style="text-align: left;">DATA:</th> </tr> <tr> <th style="text-align: center;">AGE (in weeks)</th> <th style="text-align: center;"># of SPOTS</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">2</td> </tr> </tbody> </table> <p>◆ Read the hypothesis above and study the data. Does the data support the hypothesis? Explain your answer.</p> <ul style="list-style-type: none"> a. yes b. no c. can't tell from the data given d. it does if you change the word increase to decrease 	DATA:		AGE (in weeks)	# of SPOTS	1	2	4	2	6	2
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	<i>possible.</i>							
On Going								
7. Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.	<ul style="list-style-type: none"> ◆ Critique the natural selection explanation of how Darwin’s finches developed their beaks. ◆ Have students look up the cell theory and speculate about the scientists’ hypothesis which contributed to the development of the cell theory. 		7 3(A)	<ul style="list-style-type: none"> ◆ Read the following paragraph. Refer to the key below to answer questions 1-5. <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Two populations of parasitic Hawaiian flies were thought to be the same type, but scientists wanted to be sure. Flies of the same type will mate and produce young flies. The fly populations were labeled “Group A” and “Group B”. They were placed into 4 cages like that as shown below.</p> </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 10px; text-align: center; width: 50%;"> Cage 1 “Group A” Males “Group B” Females </td> <td style="border: 1px solid black; padding: 10px; text-align: center; width: 50%;"> Cage 2 “Group B” Males “Group A” Females </td> </tr> <tr> <td style="border: 1px solid black; padding: 10px; text-align: center;"> Cage 3 “Group A” Males “Group A” Females </td> <td style="border: 1px solid black; padding: 10px; text-align: center;"> Cage 4 “Group B” Males “Group B” Females </td> </tr> </table>	Cage 1 “Group A” Males “Group B” Females	Cage 2 “Group B” Males “Group A” Females	Cage 3 “Group A” Males “Group A” Females	Cage 4 “Group B” Males “Group B” Females
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				<p>Careful records were kept. The flies were observed mating in all four cages. Only cages 3 and 4 had young flies born.</p> <p><u>Key:</u></p> <p>(A) The statement is supported by the information given. (B) The statement contradicts the information given. (C) The statement is neither supported nor contradicted by the information; more information is needed. (D) This statement cannot be proven because it is a value judgment or opinion.</p> <p><u>Questions:</u></p> <ol style="list-style-type: none"> 1. The hypothesis was to find out if male flies will mate with female flies in a cage. 2. Cages 3 and 4 were controls. 3. Cages 1 and 2 were the variable groups. 4. Flies mated only in the control cages. 5. The hypothesis was proven to be correct. <p>◆ Students will be given a list of hypothesis, conclusions, etc...Students must determine and explain if they are correct/incorrect.</p>

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8. Evaluate promotional claims that relate to biological issues such as product labeling and advertisements.	♦ Teacher and/or students will collect advertisements and labels from products which claim to benefit		9 3(B)	♦ Do the advertisements seem to promise more than the disclaimers in “fine print”? Explain why/why not. ♦ An antibacterial soap company claims that Product 2 kills more bacteria than any other soap because of the presence of





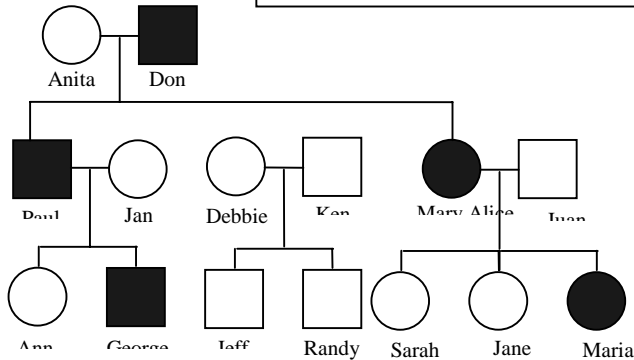
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	<p>health and/or beauty. Students should evaluate the claims of the manufacturer. Issues to be addressed should include whether or not the implied results will occur from use of the product.</p> <p>◆ Crusty Scalp Co-op Learning (Merrill)</p>			<p>lysozymes. This product must be tested against</p> <ol style="list-style-type: none"> a. Competitor’s product with lysozymes b. Competitor’s product without lysozymes. c. Water d. Product 2 without lysozymes. <p>1</p>

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On Going				
9. Evaluate the impact of research on scientific thought, society, and the environment.	<ul style="list-style-type: none"> ◆ “Biology in The News.” Find, read, and summarize two articles concerning current scientific research. ◆ “Project Wild” Dilemma Cards 	“Project Wild” Workbook.	9 3(C)	<ul style="list-style-type: none"> ◆ The rain forest is the home of countless species. Humankind is killing off the last examples of many of these species by rapid deforestation. Which of the following is an economic reason to stop deforestation? <ul style="list-style-type: none"> a. Many useful products have been discovered in the rain forest and sold to the general public. b. It is wrong to kill off other species. Humankind has no right. c. The rain forest creates oxygen which we use d. The rain forest is beautiful and deserves to be preserved. <u>Essay</u> ◆ Some industries such as the agriculture industry, have established gene banks to maintain the genetic diversity important to that industry. Explain pros/cons of this practice.
10. Describe the connection between biology and future careers. Divide the class into teams, and have a contest in which students use library references to list biology - related careers. Have students defend their answers by explaining how each career relates to biology	<ul style="list-style-type: none"> ◆ Have students research a scientific career of their choice. Information should include educational requirements, job opportunities, earning potential, job description and working conditions. 		9 3 (D)	<ul style="list-style-type: none"> ◆ A student would like to investigate careers in biology. Which summer job would offer the student the LEAST relevant experience? <ul style="list-style-type: none"> a. Nursing-home aide b. Flag person for a construction crew c. Lab assistant for a biomechanical engineering firm c. Proofreader of advertisements for a pharmaceutical company ◆ Have students design a visual aid (poster, mobile, pamphlet) to illustrate a biological career.

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11. Evaluate models according to their adequacy in representing biological objects or events.	<ul style="list-style-type: none"> ◆ Assign students to produce models which reflect the current topic of study. Examples include: cell structure, mitosis, DNA, biomes, organs, energy pyramids, biological cycles, etc. ◆ Determine the parallels between a real heart and the plastic model usually found in the classroom. ◆ Have students create their <u>own</u> dance in order to illustrate the phases of mitosis. When students have completed their dance, have them compare it to the actual event of mitosis. 		5, 6, 7, 9 3(E)	<div style="border: 2px solid black; padding: 10px;"> <div style="text-align: center; margin-bottom: 10px;">Ken</div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  Male with five fingers </div> <div style="text-align: center;">  Male with six fingers </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  Female with five fingers </div> <div style="text-align: center;">  Female with six fingers </div> </div> <div style="text-align: center; margin-top: 20px;">  </div> </div> <ul style="list-style-type: none"> ◆ Evaluate this diagram in terms of the biological objects or events it represents. Short Essay

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				<ul style="list-style-type: none"> ◆ Compare the tools used in editing DNA with the tools used to edit a video tape. Visual or written 		
On Going						
12. Research and describe the history of biology and contributions of scientists.	<ul style="list-style-type: none"> ◆ Construct a puzzle (crossword, matching, word search, word scramble) and assign topic areas of biological study, scientists, vocabulary terms ◆ In December 1854, at the inauguration of the Faculty of Science, Louis Pasteur said, “In the fields of Observation, chance favors only the mind that is prepared.” Ask students what he meant by that comment. Have 		2 3(F)	<ul style="list-style-type: none"> ◆ Matching: Match the achievement below with the scientist on the right. <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <ol style="list-style-type: none"> 1. Based all conclusion on logic. 2. Invented the compound microscope. 3. Disproved spontaneous generation by designing a curved necked flask which allowed air in but kept microorganisms out of the broth inside. 4. Invented the simple microscope. 5. Proved that maggots did not come from decaying meat but from flies. </td> <td style="width: 50%; vertical-align: top;"> <ol style="list-style-type: none"> a. Aristotle b. Robert Hooke c. Anton van Leeuwenhoek d. Franscesco Redi e. Louis Pasteur f. Lazzaro Spallanzani </td> </tr> </table> ◆ Explain in story form (TAAS format, 5 paragraphs) how the world would be different today if scientists hadn’t discovered vaccines, medications, or procedures for the following: ◆ Polio, DPT, Influenza, Small Pox 	<ol style="list-style-type: none"> 1. Based all conclusion on logic. 2. Invented the compound microscope. 3. Disproved spontaneous generation by designing a curved necked flask which allowed air in but kept microorganisms out of the broth inside. 4. Invented the simple microscope. 5. Proved that maggots did not come from decaying meat but from flies. 	<ol style="list-style-type: none"> a. Aristotle b. Robert Hooke c. Anton van Leeuwenhoek d. Franscesco Redi e. Louis Pasteur f. Lazzaro Spallanzani
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	<p>students write this quote in art paper and illustrate its meaning by drawing, painting, or making a collage from magazine pictures.</p>			<ul style="list-style-type: none"> ◆ Penicillin, Interferon, Sulfa Drugs ◆ HIV, TB, Pregnancy Tests ◆ Sex Determination or Prenatal Testing
First Six Weeks				
<p>13. Summarize the role of microorganisms in maintaining and disrupting equilibrium including diseases in plants and animals and decay in an ecosystem.</p>	<p><u>Cooperative Learning</u> (group 3-4)</p> <ul style="list-style-type: none"> ◆ Assign topic for research as: <p>Tobacco Mosaic Virus Nitrogen-Fixing Bacteria Dutch Elm Disease Wheat Rust Lyme Disease Oil-Eating Bacteria Symbiotic Algae Bacteria</p>		<p>2, 3, 6 11(D)</p>	

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	Septic Systems Sewage Treatment Nematode Plant Pests *Topic must relate to effects on ecosystems.			<ul style="list-style-type: none"> ◆ According to the results of the experiment above, which antibiotic is MOST effective in controlling this bacteria? 1. A 2. B 3. C 4. D ◆ Short Essay: Do you think that the extensive use of antibiotics in domesticated food animals (beef, chicken, pork) is a problem for humans? Explain your answer. ◆ Presentation of cooperative learning group assigned topic using rubric
First Six Weeks				
14. Analyze the flow of energy through various cycles including the carbon, oxygen, nitrogen, and water cycles.	<ul style="list-style-type: none"> ◆ Label energy cycles - use graphic organizers to compare cycles in terms of energy flow. ◆ Have students diagram how oxygen cycles through an ecosystem. 		2, 3, 7 12(A)	<ul style="list-style-type: none"> ◆ Use the diagram below to answer the following questions.

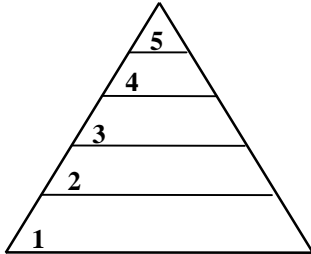
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	through an ecosystem. Ask students how the oxygen cycle relates photosynthesis to respiration?			<ul style="list-style-type: none"> ◆ 1. Nitrogen is important to plants and animals because it is the building block of <ul style="list-style-type: none"> a. cytoplasm b. protein c. cell membranes d. blood cells ◆ 2. Bacteria break down the proteins in decaying plants and animals to release <ul style="list-style-type: none"> a. calcium b. phosphate c. carbon d. ammonia ◆ In small groups, students will take turns teaching each other the cycles (carbon, O₂, N₂, H₂O) in the ecosystem and evaluating each group.
First Six Weeks				
15. Interpret interactions	◆ Simulate an activity		3, 6	◆ Nitrogen-fixing bacteria live in plant legumes on nodules of the

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<p>among organisms exhibiting predation, parasitism, commensalism, and mutualism.</p>	<p>which will require that the students demonstrate the skills of observation and inference. Teachers will use popsicle sticks of at least two sizes. The sticks will be the “organisms” and the teacher will cluster the sticks, stack the sticks, break the sticks, etc. so that the students can evaluate each situation and describe the ecological interactions (parasitism, commensalism, mutualism, and predation) present. *Based on a Project Wild activity.</p> <ul style="list-style-type: none"> ◆ Wanted Poster (assign topic areas) - Students will draw a picture and write a description of imaginary organisms such as predators, parasites, mutualistic organisms. 		<p>12(B)</p>	<ul style="list-style-type: none"> a. stem b. leaves c. root d. bud <ul style="list-style-type: none"> ◆ A cattle egret (a type of bird) eats insects off of cows; these insects are pests. What type of relationship is this? <ul style="list-style-type: none"> a. parasitism b. mutualism c. commensalism d. autotrophism ◆ How could one determine whether the relationship between two species is mutualism or commensalism?

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First Six Weeks				
27. Analyze the flow of matter and energy through different trophic levels and between organisms and the physical environment.	<ul style="list-style-type: none"> ◆ Give students a list of organisms. Have students place the organisms in the correct trophic levels of an energy pyramid. ◆ <u>DEMO</u>: To help students visualize energy transfer from producers to herbivores to carnivores, divide the class into teams of three. Give one student on each team a sheet of graph paper, and tell the student that he or she represents a plant. Have the student outline a block of squares on the graph paper and cut it out. Then tell the student to cut a row of 10 squares from the block and hand the row to a second student, who represents a herbivore. Tell the “herbivore” to cut one square from the row and 		9(D)	<ul style="list-style-type: none"> ◆ Match the organisms to their proper trophic level on the energy pyramid. <div style="text-align: center;">  </div> <ul style="list-style-type: none"> a. leopard seal b. krill c. cod d. algae e. killer whale <ul style="list-style-type: none"> ◆ <u>ESSAY</u>: Use the diagram above: In what trophic level would you place humans? Why? ◆ <u>ESSAY</u>: Explain why most ecosystems usually can contain no more than 5 trophic levels.

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	hand it to the third student, who represents a carnivore. Students will see that only a small portion of the original food energy stored in the plant (1 square of the original 100) reaches the carnivore.			
First Six Weeks				
16. Compare variations, tolerances, and adaptations of plants and animals in different biomes.	<ul style="list-style-type: none"> ◆ Student groups will research biomes and each group will produce a picture of the assigned geographic biome. ◆ Three cards for each biome must be distributed to students. Each student will receive one card: <ul style="list-style-type: none"> a. Climate Card b. Animal Card c. Plant Card <p>Students will match their cards so that they result in groups of three that represent one biome. Students will carry their cards to the</p>		3, 5 12(C)	<ul style="list-style-type: none"> ◆ What type of climate characteristics would you find in a savannah? <ul style="list-style-type: none"> a. Warm and moist, no seasonal variation b. Cool, short summers c. Hot, with wet and dry seasons d. Cold, long winters <p>COMPARE two different biomes, including plant & animal adaptations in essay form.</p>

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	<p>correct geographic regions at stations around the room.</p> <p><u>BIOME BOX</u> (addendum)</p>			
First Six Weeks				
17. Identify and illustrate that long-term survival of species is dependent on a resource base that may be limited.	<ul style="list-style-type: none"> ◆ “Oh, Deer!” (<u>Project Wild</u> (addendum)) ◆ How would the process of photosynthesis change in an area where the air pollution was so severe that sunlight could not get through? What else would change? How would that affect you? 		1, 3, 5 12(D)	The two graphs below summarize an experiment in which two types of single-celled organisms, <i>Paramecium aurelia</i> and <i>Paramecium caudatum</i> , were grown alone and together. Study the graphs and answer the questions.

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				<ul style="list-style-type: none"> ◆ Which statement is most consistent with the data summarized in the graphs? a. The two types of paramecium grew equally well alone and together b. The two types of paramecium competed for the same food source, causing the decline in the <i>P. caudatum</i> population c. <i>Paramecium aurelia</i> was unaffected when grown together with <i>P. caudatum</i>. <p>Essay Explain the effects on our <u>culture</u> if no soft drink manufacturer could use water during a multi-year water shortage?</p>
First Six Weeks				
18. Investigate and explain the interactions in an ecosystem including food chains, food webs, and food pyramids.	<ul style="list-style-type: none"> ◆ This activity will need to be performed outside. First, have the students gather a list of various organisms (plants, fungi, animals) they find either on campus or in their own yards. Second, have students bring their lists back to the classroom. Third, students will draw 		3, 5, 8 12(E)	<ul style="list-style-type: none"> ◆ Energy flows through the biosphere in a sequence of steps from organism to organism. This is a <ul style="list-style-type: none"> a. food chain b. nutrient cycle c. biochemical chain d. food web ◆ Write down each food consumed in your last main meal. Construct a food chain for each item consumed. Following

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	<p>their own food webs or energy pyramids using the organisms on their lists. Students should be able to identify such things as producers, primary consumers, trophic levels, etc. This activity may be done individually or in groups.</p> <p>◆ Assign students to groups of four. Have each group give a different example of a food chain with at least a specific producer. Post the examples.</p>			<p>this activity, use a rubric and have the class create a food web of their food chains.</p>
Second Six Weeks				
20. Identify the parts of prokaryotic and eukaryotic cells.	<p>◆ Using the following set of slides during a cell lab: cheek cell & elodea. Without describing the characteristics of eukaryotic</p>		2, 4 4(A)	<p>◆ Unlike bacteria, the cells of humans are _____ with a defined nucleus and specialized organelles.</p> <p>a. eukaryotic b. prokaryotic</p>

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	<p>and prokaryotic cells, have students discover the differences. Later add labels.</p> <ul style="list-style-type: none"> ◆ Use a Venn diagram to compare/contrast characteristics if prokaryotic/eukaryotic cell ◆ <u>Cell Project</u> - have students make a 3-D plant or animal cell model. ◆ <u>Cell Organelle T-Shirt</u>- have students make a T-shirt illustrating cell organelles. 			<p>c. autotrophic d. heterotrophic</p> <p>The diagram represents a single cell of an organism. On the right is a list of facts concerning structures found in this cell. Use the diagram and facts 1 through 6 to answer the questions.</p> <ol style="list-style-type: none"> 1. Chromatin is present in structure F. 2. Respiration occurs in structure G. 3. Food molecules increase in structure C if the organism is exposed to light. 4. The organism cannot move. 5. Structure A surrounds the entire cell and is rigid. 6. Ribosome parts are found in structure E. <ul style="list-style-type: none"> ◆ This could be an animal cell if <ol style="list-style-type: none"> a. structures A and C were not present. b. structure B were not present c. structure E were not present d. structure F were not present

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				<ul style="list-style-type: none"> ◆ Information about structure E supports the idea that <ul style="list-style-type: none"> a. food molecules are used for energy. b. photosynthesis occurs in E. c. the cell can perform biosynthesis. d. excretion occurs from the cell. ◆ All cells have <ul style="list-style-type: none"> a. cell walls and cytoplasm b. nucleus and chloroplasts c. cell membrane and cytoplasm d. mitochondria

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Second Six Weeks				
21. Investigate and identify cellular processes including homeostasis, permeability, energy production, transportation of molecules, disposal of wastes, function of cellular parts, and synthesis of new molecules.	<ul style="list-style-type: none"> ◆ A standard osmosis lab to illustrate homeostasis, permeability, transportation of molecules, and function of cellular parts. ◆ A yeast fermentation lab illustrates energy production, disposal of wastes, function of cellular parts, synthesis of new molecules. (put yeast, & sugar in Erlenmeyer flask with balloon over it.) <p><u>Demo</u></p> <ul style="list-style-type: none"> ◆ Open an odorous substance (i.e., perfume, ammonia) at one end of room and have students raise hands as they smell it. Discuss this process with students. 		2, 8 4(B)	<ul style="list-style-type: none"> ◆ A red blood cell bursts when placed in pure water while a plant cell does not because the plant cell has a <ul style="list-style-type: none"> a. contractile vacuole b. cell wall c. cell membrane d. central vacuole ◆ Predict what would happen if red blood cells and plant cells were each placed in containers of distilled water. Draw a picture of the cells.

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Second Six Weeks				
22. Compare cells from different parts of plants and animals including roots, stems, leaves, epithelia, muscles, and bones to show specialization of structure and function.	<ul style="list-style-type: none"> ◆ Have students identify similarities and differences between the <i>Chilodenella</i> and the <i>bacterium</i>. ◆ Have students get into groups of 2 or 3. Ask students to research and prepare a report on the differences between normal human cells and cancer cells. Find out about the differences in cell structure, reproduction rate, and metabolism. Find out how these differences are exploited to create 		1, 2, 5 5(A)	<ul style="list-style-type: none"> ◆ Plant cells are capable of making their own food while animal cells cannot. Plant cells have this capability because of the presence of <ol style="list-style-type: none"> 1. mitochondria 2. nuclei 3. chloroplasts 4. ribosomes ◆ <u>ESSAY</u>: Explain how one would determine whether an unidentified cell was aplant or animal, eukaryotic or prokaryotic.

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	<p>cancer therapy drugs. Make poster to go along with the report.</p>			
Second Six Weeks				
<p>23. Sequence the levels of organization in multicellular organisms to relate the parts to each other and to the whole.</p>	<ul style="list-style-type: none"> ◆ Show a photo of an athlete - ask students to identify structural levels of organization this individual is using to perform. ◆ Sequence the levels of organization using a Graphic Organizer. 		<p>2 5(C)</p>	<ul style="list-style-type: none"> ◆ An organ is defined as a group of _____ which combine to perform some special functions. <ul style="list-style-type: none"> a. cells b. tissues c. organelles d. systems ◆ ESSAY: What are the advantages of specialized tissues in multicellular organisms?

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Second Six Weeks				
24. Compare the structures and functions of different types of biomolecules such as carbohydrates, lipids, proteins, and nucleic acids.	<p>◆ <u>LAB</u>: Students will perform chemical tests of organic compounds on known and unknown substances.</p> <p>-iodine for starch</p>		2, 5 9(A)	<p>◆ Each of the following is an example of a biomolecule EXCEPT</p> <p>a. carbohydrate b. lipid c. mineral d. protein</p>

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	-biuret for protein -solubility of lipids in alcohol or water ♦ Prepare a table on the board. Across the top, write the names of the four major types of organic compounds. Down the left side of the table, write Elements present Functions, Examples, and Special properties. Have students fill in the necessary work information.			♦ <u>ESSAY</u> : Explain how the following biomolecules: differ or are similar: carbohydrates, proteins, lipids, and nucleic acids
Second Six Weeks				
25. Compare the energy flow	♦ <u>Cooperative Learning</u> :		2, 5	♦ Carbon dioxide is to photosynthesis as oxygen is to:

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in photosynthesis to the energy flow in cellular respiration.	<p>Develop an artistic display to summarize how photosynthesis and respiration are related. Show how energy is passed to plants and then to animals.</p> <ul style="list-style-type: none"> ◆ Have students create a Venn diagram to compare photosynthesis and cellular respiration. 		9(B)	<p>a. anaerobic respiration b. aerobic respiration c. fermentation d. glycolysis</p> <p>◆ Write a paper pretending you are a carbon atom experiencing photosynthesis and respiration. Describe your experiences.</p> <p>◆ Use the following diagram to answer the questions:</p> <p>a. Where in the above diagram is light absorbed and its energy trapped in the chemical bonds of glucose? b. Where is ATP processed? c. In what form is energy returned to the environment by living organisms?</p>

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				d. In cellular respiration, what chemical substance does the mitochondrion use to break down glucose into carbon dioxide and water?
Second Six Weeks				
26. Investigate and identify the effects of enzymes on food molecules.	<p>◆ Students will work in groups of 2 to 4. Each group will receive 2 petri dishes and one apple. Students will slice the apple into four sections. One section will be put in the bottom of a petri dish and set aside at room temperature. One section will be put in the top of the same petri dish and placed in a container of ice or in a refrigerator. One section will be placed in the second petri dish bottom and placed in a warm incubator and the final one will be placed in the second lid and covered with lemon juice. Students will hypothesize which condition will be best and which will be worst for the enzyme catecholase, to cause the fruit to brown. Students will check the browning of the apples every ten minutes, record the amount of browning that occurs for each and draw conclusions based on their observations.</p>		<p>2, 7, 8</p> <p>9(C)</p>	<p>◆ The function of an enzyme is to:</p> <p>a. slow reactions b. speed reactions c. store energy d. use energy</p> <p>Design an experiment to show how the concentration of hydrogen peroxide (H₂O₂) affects the rate of its breakdown. (add: potato, apple)</p>

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	<ul style="list-style-type: none"> ◆ Combine ground liver and fresh hydrogen peroxide to cause oxygen production (bubbles). 			
Third Six Weeks				
28. Describe components of deoxyribonucleic acid (DNA) and illustrate how information for specifying the traits of an organism is carried in the DNA.	<ul style="list-style-type: none"> ◆ Have students make a paper or 3-dimensional model of DNA. ◆ Use/Identify. 3 codons on your DNA model and determine the amino acid sequence they represent. Check model for accuracy 	“Code of Life” video	1, 5 6(A)	<ul style="list-style-type: none"> ◆ For DNA to control and communicate synthesis of proteins, it must possess a part that can vary in order to give directions for formation of the many different proteins found in a living organism. <ul style="list-style-type: none"> a. The order of sugars and phosphates along the sides. b. The order of nitrogen-containing bases forming the rungs. c. The shape of the ladder. d. The types of bonding. ◆ Use your DNA model to explain protein synthesis.

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Third Six Weeks				
29. Explain replication, transcription, and translation using models of DNA and ribonucleic acid (RNA).	<ul style="list-style-type: none"> ◆ Role play the action of bases in the transcription process. ◆ “<u>Protein Synthesis Flip Books</u>”. Have students work in pairs. One will be assigned “Transcription”. The students will illustrate and label the stages in each step, and then put their work together into one book. Ideally, the final result will be a flip book that shows the process of protein synthesis. ◆ Protein Synthesis lab (cut and paste dry lab) See addendum p. 		1, 6, 7 6(B)	<ul style="list-style-type: none"> ◆ Select the correct sequence in which the following occur: <ol style="list-style-type: none"> 1. t-RNA lands and releases amino acid 2. m-RNA is translated by a ribosome 3. DNA is copied by m-RNA 4. m-RNA leaves nucleus to find ribosome <p>A. 1 2 4 3 B. 3 4 2 1 C. 3 2 4 1 D. 3 4 1 2</p> ◆ <u>Essay</u>: After messenger RNA has assisted in the formation of necessary proteins within the cell, it breaks down into free-floating nucleotides. What problems would occur inside in the cell if RNA did not break down protein after photosynthesis?

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	<ul style="list-style-type: none"> ◆ Protein Synthesis Story (ABCD curriculum) 			
Third Six Weeks				
30. Compare the processes of mitosis and meiosis and their significance to sexual and asexual reproduction.	<ul style="list-style-type: none"> ◆ Each student in groups of 4 uses multiple colors of construction paper to make one of 4 phases of mitosis. each teaches the others his/her phase. Later each student is given more paper to add the phases of meiosis to the 4 phase model created originally. ◆ Mendrek's M & M's activity. See addendum attached. ◆ Venn diagram - 	Merrill Text	1, 2, 5 6(E)	<ul style="list-style-type: none"> ◆ Genetic recombination occurs during the process of <ul style="list-style-type: none"> a. tetrad formation b. crossing over c. synapsis d. replication ◆ Unlike mitosis, meiosis results in <ul style="list-style-type: none"> a. 2 diploid cells b. 2 haploid cells c. 4 diploid cells d. 4 haploid cells

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	similarity/differences between mitosis and meiosis.			<p><u>Compare & Contrast mitosis/meiosis using Venn diagram.</u></p> <p>◆ <u>Essay:</u> How does mitosis promote genetic consistency?</p>												
Third Six Weeks																
31. Compare genetic variations observed in plants and animals.	<p>◆ Give students a variety of Punnett Square problems that demonstrate Mendelian inheritance patterns for both plants and animals. Examples can include the classic pea plant characteristics as well as</p>		1, 5, 6, 7 6(D)	<table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td></td> <td></td> <td style="text-align: center;">R</td> <td style="text-align: center;">r</td> </tr> <tr> <td style="text-align: center;">R</td> <td style="border: 1px solid black; padding: 5px;">RR</td> <td style="border: 1px solid black; padding: 5px;">Rr</td> <td></td> </tr> <tr> <td style="text-align: center;">r</td> <td style="border: 1px solid black; padding: 5px;">Rr</td> <td style="border: 1px solid black; padding: 5px;">rr</td> <td></td> </tr> </table>			R	r	R	RR	Rr		r	Rr	rr	
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	<p>human characteristics such as tongue-rolling, widow's peak, etc. The students should be able to predict the outcomes of various crosses presented to them using such traits.</p> <ul style="list-style-type: none"> ◆ Making Babies Lab (Penny Ante Science) 			<ul style="list-style-type: none"> ◆ The Punnett square above shows a cross between two heterozygous long-haired guinea pigs. What is the chance of any of the offspring having short hair? <ul style="list-style-type: none"> a. 0% b. 25% c. 50% d. 75% ◆ Compare incomplete dominance with codominance. Give an example of each pattern of heredity.
Third Six Weeks				
32. Identify and illustrate how changes in DNA cause	<ul style="list-style-type: none"> ◆ Have students work in groups of three to four. 		1, 5 6 (C)	<ul style="list-style-type: none"> ◆ Which of the following represents an example of a deletion of the original gene sequence, ABCD?

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<p>mutations and evaluate the significance of these changes.</p>	<p>Divide each group into “counselors” and “family members”. Assign each group a genetic disorder to research. The “family members” should have questions prepared and the “counselors” should have the answers to those questions ready. Questions/answers should include type of mutation that causes the disease, chromosome affected, pattern of inheritance, group(s) most often affected (if any), frequency of occurrence, etc. The results of the research should be presented as role-playing presentations to the rest of the class.</p> <p>◆ Have students research history books to construct a pedigree showing the spread of hemophilia throughout the royal families of Europe, beginning with Queen Victoria. Students should note how the disease was spread to other countries by marriages among nobility.</p>			<p>a. AABCD b. ACD c. ACBE d. ABCDE</p> <p>◆ <u>EXTENDED ESSAY</u>: Explain how mutations contribute to the evolution of species overtime.</p>

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Third Six Weeks				
33. Identify and analyze karyotypes.	<ul style="list-style-type: none"> ◆ Give students copies of pictures of chromosomes photographed during metaphase. Have them sort the chromosomes into pairs and determine if the “individual’s” karyotype is normal based on the number, shape, and size of the paired chromosomes. Example: by including three #21’s the students should easily be able to detect Down’s syndrome. They should also be able to determine the sex of the “individual”. ◆ Lady Bug Lab (Merrill book). See addendum 		1, 6, 7 6(F)	<ul style="list-style-type: none"> ◆ Which of the following represents a normal male? <ul style="list-style-type: none"> a. XX b. XY c. YY d. XXY ◆ Brainstorm issues that may occur by being able to analyze karyotypes and have a class debate. (ie. hiring issues, insurance, desire to know, etc.). Discuss the pros/cons.

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Fourth Six Weeks				
36. Identify evidence of change in species using fossils, DNA sequences, anatomical similarities, physiological similarities, and embryology.	<ul style="list-style-type: none"> ◆ Have students recreate Landis’s experiment (see addendum). Have them photograph each other “assuming” a list of expressions that they have agreed upon such as happy, sad, angry, etc. See if they can name the correct “assumed” expression. Find pictures of animals from different sources and try to determine their emotions from their facial or bodily expressions. Have students discuss the possible reasons for any similarities or differences in the animal expressions and those of a human. ◆ Examine various examples from the Merrill Skull lab and Cytochrome C 		1, 5, 7 7(A)	<ul style="list-style-type: none"> ◆ Explain why all of the following are examples of homologous structures EXCEPT: <ul style="list-style-type: none"> a. b. c.

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	<p>from Prentice Hall to show changes in the species, anatomical similarities and DNA sequences.</p> <ul style="list-style-type: none"> ◆ Homologous Structures Lab - Miller and Levine 			<p>d.</p> <p><u>Essay</u> What are the two hypotheses for the origin of <i>Homo sapiens</i>? How does evidence from DNA sequences support the “African origins” hypothesis?</p>
Fourth Six Weeks				
37. Illustrate the results of natural selection in speciation, diversity, phylogeny, adaptation, behavior, and extinction.	<ul style="list-style-type: none"> ◆ Show a video on the Galapagos Islands to describe speciation and diversity. ◆ Inform students that 13 species of finches are found on the 13 main volcanic masses that make up the Galapagos Islands. Ask students why islands such as the Galapagos favor divergence. 	See addendum: “DNA, Dinosaurs & Darwin,”	<p>1, 3</p> <p>7(B)</p>	<ul style="list-style-type: none"> ◆ In England before 1850, tree trunks were covered with a lichen that gave the bark a grayish-white color. Moths that rested on the trees were either peppered or dark in color. The gene for dark color: <ul style="list-style-type: none"> a. was present in the moth population before 1850 b. is no longer in the population c. has not been a factor in the survival of the moths d. mutated to cause the moth to change into a dragonfly ◆ ESSAY: If all living things are controlled by DNA how does evolution account for the great diversity of life? ◆ Use Assessments in “DNA, Darwin, Dinosaurs”

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		www.woodrow.org		
Fouth Six Weeks				
38. Collect and classify organisms at several taxonomic levels such as species, phylum, and kingdom using dichotomous keys.	<ul style="list-style-type: none"> ◆ Have students make collections (shell, insect, leaf, etc.) and classify the specimens in the collection according to specified taxonomic levels (kingdom, phylum, class, etc.) ◆ Use pen and pencil dichotomous keys to classify organisms. 		2, 5 8(A)	<ul style="list-style-type: none"> ◆ Grade collections using a rubric ◆ Which of the following is the correct sequence for the levels of organization?

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				<ul style="list-style-type: none"> a. kingdom, phylum, order, class, family, genus, species b. kingdom, order, phylum, class, family, genus, species c. kingdom, phylum, class, family, order, genus, species d. kingdom, phylum, class, order, family, genus, species
39. Analyze relationships among organisms and develop a model of a hierarchical classification system based on similarities and differences using taxonomic nomenclature.	<ul style="list-style-type: none"> ◆ Students will establish their own classification system given specimen samples. For example, seashells, preserved specimens, fur types, hardware items, etc. ◆ Minilab - PH p. 395 		2, 5, 7 8(B)	<ul style="list-style-type: none"> ◆ Make a chart of the kingdoms & list the characteristics of each. ◆ For each pair of terms, explain the differences in their meanings. a. genus, species b. phylum, division c. analogous structure, homologous structure
Fouth six Weeks				
37. Identify characteristics of kingdoms including monerans, protists, fungi, plants, and animals.	<ul style="list-style-type: none"> ◆ Construct a chart identifying the characteristics of the six kingdoms. Characteristics to identify should include 		2, 5 8(C)	<ul style="list-style-type: none"> ◆ Mushrooms are classified as fungi because they: <ul style="list-style-type: none"> a. have chlorophyll b. photosynthesize c. don't photosynthesize d. have roots

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	<p>type of cell, number of cells, method of nutrition, examples.</p> <ul style="list-style-type: none"> ◆ Display several organisms from each kingdom and have students classify them into proper kingdoms. The students in each group should write questions and answers about the organism in each kingdom. 			<ul style="list-style-type: none"> ◆ Use models, specimens or pictures. Have students determine the kingdom in which each belongs and write the basis for their answers by identifying specific characteristics.

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Biology
Grade 9, 10, or 11**

<i>Performance Indicator</i>	<i>Teaching Strategy</i>	<i>Resources</i>	<i>TEKS/ TAAS</i>	<i>Sample Assessment</i>
Fouth Six Weeks				
39. Identify and describe the role of bacteria in maintaining health such as in digestion and in causing diseases such as in streptococcus infections, and diphtheria.	<ul style="list-style-type: none"> ◆ Assign groups of four students to be “newscast teams” researching an epidemic. The epidemic may include bacterial (and viral if so desired) diseases. The students should be prepared to present (in written, oral, or video form) information about their assigned disease and include charts, graphs, slides, etc. informing “the public” about the cause of the disease, the nature of the pathogen, its transmission, treatment, prevention, impact on the community, etc. ◆ Invite a healthcare professional to speak to students regarding the impact of bacteria on his/her job. ◆ Have students work w/family members to trace any afflictions related to bacteria that have occurred in the last 6 months (ear aches, sore throats, etc.) 		2, 5 4(D)	<ul style="list-style-type: none"> ◆ Which of the following is most commonly prescribed to combat bacterial infections? <ul style="list-style-type: none"> a. vaccines b. antibodies c. antibiotics d. antihistamines ◆ <u>ESSAY</u>: What bacterial diseases were prevalent or played a major role in history? Which bacterial diseases continue to influence our lives? Discuss why they continue to be a problem.

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Fifth Six Weeks				
40. Identify cell differentiation in the development of organisms.	<p><u>LAB</u>: comparison and observation</p> <ul style="list-style-type: none"> ◆ Teacher will select microscope or projection slides and/or photographs of various cell types from different organisms. ◆ Students will observe slides and answer questions about cell differences based on their observations. ◆ Poster or clay model of various stages of development or layers of tissues. 	Holt p. 457, 326	2 5(B)	<ul style="list-style-type: none"> ◆ Which of the following is the proper sequence in the development of the frog following fertilization? <ul style="list-style-type: none"> a. larva, blastula, cleavage, gastrula b. cleavage, blastula, gastrula, larva c. cleavage, gastrula, larva, blastula d. blastula, cleavage, larva, gastrula ◆ Describe the steps of gastrulation that lead to endoderm and ectoderm. What tissues or systems arise from these layers?

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Fifth Six Weeks				
41. Evaluate the significance of structural and physiological adaptations of plants to their environments.	<ul style="list-style-type: none"> ◆ Teacher will place pictures and/or samples of various plants at stations around the room. The students will evaluate each station including such information as: <ul style="list-style-type: none"> a. Biome in which the plant would most likely live. b. Special adaptations of the plant for its environment. ◆ Review the flower parts and their functions with the class. Have students 		1, 3, 6, 7 13(A)	<ul style="list-style-type: none"> ◆ Part of the reason for the success of angiosperms is <ul style="list-style-type: none"> a. the speed at which they grow and reproduce b. their efficient vascular system c. their adaptations to terrestrial life d. all of the above ◆ ANGIOSPERM PROJECT: Create a poster using a rubric with actual specimens from flowering plants ◆ Include 2 each for monocots & dicots <ul style="list-style-type: none"> 2 leaves 2 seeds 2 flowers 2 roots ◆ Press & glue neatly ◆ List differences for each plant part

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	<p>draw and label a flower from memory. Then have them check their drawing by comparing it to a teacher selected figure. Have students repeat the process until they have the labels memorized.</p>			<p>◆ I.D./label what plant the structure came from</p>
Fifth Six Weeks				
<p>42. Analyze and identify characteristics of plant systems and subsystems.</p>	<p>◆ Given a diagram of the various components of the food transportation system of plants, students will be expected to “color code” each component according to its specific function. Example: Prevention of water loss--blue; protection--red; site of photosynthesis--green;</p>		<p>2, 3, 7 10(C)</p>	<p>◆ Complete the following analogies:</p> <p>a. Fungus is to heterotroph as plant is to _____</p> <p>b. Gamete forming plant is to gametophyte as spore forming plant is to _____</p> <p>c. Gymnosperm is to cone as angiosperm is to _____</p> <p>◆ Analyze the lab report by using a rubric.</p>

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	<p>location of vascular tissue--yellow</p> <p>◆ <u>Plant classification lab</u>- Given samples, ie. fern frond, moss and seed plant, ask students to draw each specimen and identify such characteristics as limitations on size, evidence of vascular tissue, plant cell characteristics, etc.</p>			
Fifth Six Weeks				
43. Survey and identify methods of reproduction, growth, and development of various types of plants. Students will participate in a seed and flower dissection and will explain	<p>◆ Students will create a chart comparing reproduction in nonvascular and vascular plants. Specifics should include type of reproduction, method of reproduction,</p>		2, 5 13(B)	<p>◆ A fruit is sometimes defined as a ripened ovary used to transport seeds or provide nutrients to the seeds of an angiosperm. Which of the following is a fruit?</p> <p>a. tomato b. potato c. lettuce</p>

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how the seed or plant grew, reproduced and developed.	structures involved, examples.			d. pine cone ◆ Evaluate the lab using a rubric.
Sixth Six Weeks				
44. Interpret the functions of	◆ Put students in groups		10(A)	◆ Every cell in your body requires fuel. The fuel comes from the

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<p>systems in organisms including circulatory, digestive, nervous, endocrine, reproductive, integumentary, skeletal, respiratory, muscular, excretory, and immune.</p>	<p>of two. Teams should brainstorm to create a list of human body organs and then classify the organs into systems and state their functions. The students will organize their information on a 2 meter long sheet of paper. Next, the students should try to accurately position and draw each organ with a different color/system. Teams should then collaborate to check their work and revise if necessary.</p> <ul style="list-style-type: none"> ◆ Label diagrams of the individual body systems. ◆ In chart form, identify the organ systems and functions of the organs. 			<p>food you eat and provides your body with necessary nutrients. digestion breaks down carbohydrates, fats, and proteins to supply the important nutrients for proper body function. In what way do these nutrients contribute to proper body function?</p> <ol style="list-style-type: none"> a. Electrical signals are sent by the sensory nerves to indicate a homeostatic body system. b. Raw materials are extracted for building, repairing, and controlling your body systems. c. Protection is provided for exposure to harmful external stimuli such as sunlight. d. Vitamins are allowed to dissolve in water and in fats. <ul style="list-style-type: none"> ◆ Explain how each organ system depends on the other systems in order to keep an organism alive.

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Sixth Six Weeks				
45. Identify and describe the relationships between internal feedback mechanisms in the maintenance of homeostasis.	<ul style="list-style-type: none"> ◆ Have students work in groups. Assign each group to research a particular endocrine gland. Students should be able to list how the gland, when working properly, helps the body maintain balance and proper function. They should also be able to tell what happens when the gland is over or under active. Each group could create a chart to combine their research. ◆ Make a flow chart of human internal feedback. 		2, 5 11(A)	<ul style="list-style-type: none"> ◆ The amount of sugar present in blood is critical to the health of brain cells. If the blood sugar level is too high, the brain stimulates the _____ to release the hormone _____. a. pancreas, glucagon b. pancreas, insulin c. thyroid, thyroxine d. pituitary, ACTH ◆ Explain the function of a thermostat in regulating room temperature. Apply this analogy to internal feedback within the body.

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Sixth Six Weeks				
46. Investigate and identify how organisms, including humans, respond to external stimuli.	◆ Assign each group a different sense. Each group is to prepare an investigation that “demonstrates” a response to external stimuli for that sense. Students will be expected to design the investigation utilizing materials available and demonstrate proper lab procedures. Presentation of investigation (including design, observation, results, etc.) is expected.		3, 8 11(B)	Use the following diagram to answer the questions below. The birds in this diagram fly south during the a. rainy season b. summer c. spring d. fall

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				<p>Breeding took place during the summer in</p> <ol style="list-style-type: none"> a. Mexico b. Canada c. Central America d. the United States <p>◆ Students will participate in a stimulus-response lab and report conclusions. This will be graded using a rubric.</p>
Sixth Six Weeks				
47. Compare the interrelationships of organ systems to each other and to the body as a whole.	◆ See demonstration assessment for PI #46: these two PI's should be addressed simultaneously.		2, 3, 5 10(B)	<p>◆ The endocrine system is the body's way of chemically speeding up, slowing down, or turning off the activities of various tissues and organs. An example of the endocrine system functioning would be--</p> <ol style="list-style-type: none"> a. the brain sending a message through the neurons to the hand. b. a growth hormone regulating the growth of a human over the course of his/her life. c. ATP being broken down to create ADP and usable energy. d. a heart contracting to bring blood to the cells. <p>◆ Can any of the eleven body systems work in isolation from the others? Explain your answer.</p>

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48. Analyze the importance of nutrition, environmental conditions, and physical exercise on health.	<ul style="list-style-type: none"> ◆ Students maintain a nutrition and exercise diary and analyze their results with the food pyramid. ◆ Obtain a list from a fast food establishment that describes the nutritional content of the fast food products. The student will describe a meal he/she 		3, 7, 9 11(C)	<ul style="list-style-type: none"> ◆ During the past 70 years researchers have found ways to prevent or cure many diseases. People have learned to eat healthier diets and to stay away from substances like cigarettes and alcohol which are unhealthy. People also exercise more now than they did in the past. How has all this affected life expectancy? <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3" style="text-align: center;">YEARS OF LIFE EXPECTED AT BIRTH</th> </tr> <tr> <th style="text-align: center;">Year</th> <th style="text-align: center;">Males</th> <th style="text-align: center;">Females</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1920</td> <td style="text-align: center;">53.6</td> <td style="text-align: center;">54.6</td> </tr> <tr> <td style="text-align: center;">1930</td> <td style="text-align: center;">58.1</td> <td style="text-align: center;">61.6</td> </tr> <tr> <td style="text-align: center;">1940</td> <td style="text-align: center;">60.8</td> <td style="text-align: center;">65.2</td> </tr> <tr> <td style="text-align: center;">1950</td> <td style="text-align: center;">65.6</td> <td style="text-align: center;">71.1</td> </tr> <tr> <td style="text-align: center;">1960</td> <td style="text-align: center;">66.6</td> <td style="text-align: center;">73.1</td> </tr> </tbody> </table>	YEARS OF LIFE EXPECTED AT BIRTH			Year	Males	Females	1920	53.6	54.6	1930	58.1	61.6	1940	60.8	65.2	1950	65.6	71.1	1960	66.6	73.1
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	<p>would consume and compare the nutritional information with the recommended guidelines.</p>			<ul style="list-style-type: none"> ◆ Based on the table, the life expectancy of boys born in 1990 would be closest to <ul style="list-style-type: none"> a. 65 years b. 75 years c. 80 years d. 85 years ◆ Have students describe fad diets they have heard of, read about, or tried, and analyze the diets for possible nutritional or health problems.