SPRING GROVE AREA SCHOOL DISTRICT

PLANNED INSTRUCTION

Course Title:	**Environmental Science**	**Length of Course:**	**30 Cycles**
Grade Level(s):	**11**	**Periods Per Cycle:**	**6**
Units of Credit:	**1.0**	**Length of Period:**	**43 Minutes**
Required:	**Core Science** **Elective:**	**Total Instructional Time:**	**258 Minutes**

Course Description: Environmental science is a multidisciplinary course that helps students better understand the relationship between humans and the world they live in. This course, as an applied science, will incorporate principles of chemistry and biology to help achieve practical goals. The focus of environmental science is conservation and the protection of natural resources.

Objectives of Planned Course:

1. The student will examine ecosystems and their interactions.
2. The student will identify the organization of life in various ecosystems.
3. The student will analyze how human action and natural changes affect the balance within an ecosystem.
4. The student will recognize the importance of biological diversity as it relates to the stability of an ecosystem.
5. The student will identify the impact of cycles on the ecosystem.
6. The student will analyze environmental laws and regulations as they relate to environmental issues.

Relationship to Academic Standards and Strategic Plan:

Science and Technology, Life Skills

Materials/Resources: Text Book:

Environmental Science (Holt, 2007), Handouts, Laboratory Equipment, Safety Equipment, Technology Equipment

Adopted: 11/20/91
Revised: 7/15/98; 11/15/01; 8/20/07

CONTENT	STANDARDS	GRADE-LEVEL BENCHMARKS GRADE SPECIFIC CRITERIA	INSTRUCTIONAL STRATEGIE LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES	ASSESSMENTS
Introduction to Environmental Science *Understanding Our Environment **ESSENTIAL QUESTIONS** Why should we be concerned about our environment? hat responsibilities do we have as intelligent beings on earth? **TIME:** 4 Days	S11.A.1.1 Analyze and explain the nature of science in the search for understanding the natural world and its connection to technological systems	S11.A.1.1. Compare and contrast scientific theories, scientific laws, and beliefs (e.g., stages of ecological succession, environmental effects of hunter-gatherers, the agricultural revolution, and the industrial revolution)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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ENRICHMENT AND EXPANDED OPPORTUNITIES: Webquests, creating stories or comic strips, research/lab extension, analysis and compilation of data, group leader, power point presentations, publishing journal entries, connection to current events				
REMEDIATION AND INTERVENTION STRATEGIES: Review prior material, individual tutoring, peer tutoring, re-teaching, re-testing, word wall, graphic organizer, flash cards, reinforcement through visual aids, review game, verbal assessment, connection to current events				

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Introduction to Environmental Science *The Environment and Society *Making Informed Decisions **TIME:** 4 Days	**S11.A.1.1** Analyze and explain the nature of science in the search for understanding the natural world and its connection to technological systems	**S11.A.1.1.2** Analyze and explain how to verify the accuracy of scientific facts, principles, theories, and laws	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Scientific Methods *Statistics and Models *Making Informed Decisions **TIME:** 2 Days	**S11.A.1.1** Analyze and explain the nature of science in the search for understanding the natural world and its connection to technological systems	**S11.A.1.1.3** Evaluate the appropriateness of research questions (e.g., testable vs. not-testable)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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The Environment & Society **Tools of Environmental Science** *Statistics and Models *Making Informed Decisions **TIME:** 2 Days	**S11.A.1.1** Analyze and explain the nature of science in the search for understanding the natural world and its connection to technological systems	**S11.A.1.1.4** Explain how specific scientific knowledge or technological design concepts solve practical problems (e.g., theory of evolution, laws of supply and demand)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Scientific Methods *Making Informed Decisions **TIME:** 2 Days	**S11.A.1.1** Analyze and explain the nature of science in the search for understanding the natural world and its connection to technological systems	**S11.A.1.1.5** Analyze or compare the use of both direct and indirect observation as means to study the world and the universe (e.g., functions of organisms in an ecosystem)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Statistics and Models *Making Informed Decisions **TIME:** 2 Days	**S11.A.1.2** Identify and analyze the scientific or technological challenges of societal issues; propose possible solutions and discuss implications	**S11.A.1.2.1** Apply and explain scientific concepts to societal issues using case studies (e.g., sea level change, deforestation, environmental health, energy use)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Statistics and Models *Making Informed Decisions **TIME:** 3 Days	**S11.A.1.2** Identify and analyze the scientific or technological challenges of societal issues; propose possible solutions and discuss implications	**S11.A.1.2.2** Use case studies (e.g., Saving the Everglades, restoration of the Chesapeake Bay, the Ogallala Aquifer, paper or plastic?) to propose possible solutions and analyze economic and environmental implications of solutions for real-world problems	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Statistics and Models *Making Informed Decisions **TIME:** 4 Days	**S11.A.1.3** Describe and interpret patterns of change in natural and human-made systems	**S11.A.1.3.3** Describe how changes in physical and biological indicators (e.g., soil, plants, or animals) of water systems reflect changes in these systems (e.g. changes in bloodworm populations reflect changes in pollution levels in streams)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Introduction to Environmental Science *Economics and the Environment *Population and Consumption **TIME:** 4 Days	**S11.A.1.3** Describe and interpret patterns of change in natural and human-made systems	**S11.A.1.3.4** Compare the rate of use of natural resources and their impact on sustainability	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Scientific Methods **TIME:** 2 Days	**S11.A.2.1** Apply knowledge of scientific investigation or technological design to develop or critique aspects of the experimental or design process	**S11.A.2.1.1** Critique the elements of an experimental design (i.e., raising questions, formulating hypotheses, developing procedures, identifying variables, manipulating variables, interpreting data, and drawing conclusions) applicable to a specific experimental design	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Scientific Methods *Statistics and Models *Making Informed Decisions **TIME:** 2 Days	**S11.A.2.1** Apply knowledge of scientific investigation or technological design to develop or critique aspects of the experimental or design process	**S11.A.2.1.2** Critique the elements of the design process (e.g. identify the problem, understand criteria, create solutions, select solution, test/evaluate, communicate results) applicable to a specific technological design	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Scientific Methods *Statistics and Models *Making Informed Decisions **TIME:** 3 Days	**S11.A.2.1** Apply knowledge of scientific investigation or technological design to develop or critique aspects of the experimental or design process	**S11.A.2.1.3** Use data to make inferences and predictions, or to draw conclusions, demonstrating understanding of experimental limits	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Scientific Methods *Statistics and Models *Making Informed Decisions **TIME:** 2 Days	**S11.A.2.1** Apply knowledge of scientific investigation or technological design to develop or critique aspects of the experimental or design process	**S11.A.2.1.4** Critique the results and conclusions of scientific inquiry for consistency and logic	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Scientific Methods *Statistics and Models *Making Informed Decisions **TIME:** 3 Days	**S11.A.2.1** Apply knowledge of scientific investigation or technological design to develop or critique aspects of the experimental or design process	**S11.A.2.1.5** Communicate results of investigations using multiple representation	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Scientific Methods *Statistics and Models *Making Informed Decisions **TIME:** 3 days	**S11.A.2.2** Evaluate appropriate technologies for a specific purpose, or describe the information the instrument can provide	**S11.A.2.2.1** Evaluate appropriate methods, instruments, and scale for precise quantitative and qualitative observations (e.g., to compare water quality	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Tools of Environmental Science *Statistics and Models *Making Informed Decisions **TIME:** 4 Days	**S11.A.2.2** Evaluate appropriate technologies for a specific purpose, or describe the information the instrument can provide	**S11.A.2.2.2** Explain how technology is used to extend human abilities and precision (e.g., GPS, spectroscope, scanning electron microscope, pH meters, probes, interfaces, imaging technologies, telescope)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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The Hydrosphere & Biosphere **TIME:** 2 Days	**S11.A.3.1** Analyze the parts of a simple system, their roles, and their relationships to the system as a whole	**S11.A.3.1.1** Apply systems analysis, showing relationships (e.g., flowcharts, decision trees, dichotomous keys, mind map), input and output, and measurements to explain a system and its part	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Atmosphere *Greenhouse Effect *Global Warming **TIME:** 3 Days	**S11.A.3.1** Analyze the parts of a simple system, their roles, and their relationships to the system as a whole	**S11.A.3.1.2** Analyze and predict the effect of making a change in one part of a system on the system as a whole	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Hydrosphere & the Biosphere **TIME:** 2 Days	**S11.A.3.2** Compare observations of the real world to observations of a constructed model	**S11.A.3.2.1** Compare the accuracy of predictions represented in a model to actual observations and behavior	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
MATERIALS AND RESOURCES: Text, overhead and transparencies, worksheets, vocabulary list, lab activities, models, demonstrations, newspaper and other news media, poster paper and markers, internet, computer and projector, teacher-supplied materials				
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CONTENT Environmental Science – Gr. 11	STANDARDS	GRADE-LEVEL BENCHMARKS GRADE SPECIFIC CRITERIA	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES	ASSESSMENTS
The Organization of Life *Ecosystems: Everything is Connected **TIME:** 2 Days	**S11.A.3.2** Compare observations of the real world to observations of a constructed model	**S11.A.3.2.2** Describe advantages and disadvantages of using models to simulate processes and outcomes	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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CONTENT Environmental Science – Gr. 11	STANDARDS	GRADE-LEVEL BENCHMARKS GRADE SPECIFIC CRITERIA	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES	ASSESSMENTS
The Organization of Life *Ecosystems: Everything is Connected *Evolution *The Diversity of Living Things **TIME:** 4 Days	**S11.A.3.2** Compare observations of the real world to observations of a constructed model	**S11.A.3.2.3** Describe how relationships represented in models are used to explain scientific or technological concepts (e.g., life spans, size of populations, topographic maps)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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CONTENT Environmental Science – Gr. 11	**STANDARDS**	**GRADE-LEVEL BENCHMARKS** **GRADE SPECIFIC CRITERIA**	**INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES**	**ASSESSMENTS**
The Organization of Life *Ecosystems: Everything is Connected *Evolution **TIME:** 1 Day	**S11.A.3.3** Compare and analyze repeated processes or recurring elements in patterns	**S11.A.3.3.2** Compare stationary physical patterns (e.g., tree rings) to the object's properties	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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CONTENT Environmental Science – Gr. 11	STANDARDS	GRADE-LEVEL BENCHMARKS GRADE SPECIFIC CRITERIA	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES	ASSESSMENTS
The Organization of Life *Ecosystems: Everything is Connected *Evolution *The Diversity of Living Things **How Ecosystems Work** *Energy Flow in Ecosystems	**S11.B.1.1** Explain structure and function at multiple levels of organization	**S11.B.1.1.1** Explain how structure determines function at multiple levels of organization (e.g., chemical, cellular, anatomical, ecological)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
TIME: 2 Days				
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The Organization of Life *Ecosystems: Everything is Connected **How Ecosystems Work** *Energy Flow in Ecosystems *The Diversity of Living Things **TIME:** 4 Days	**S11.B.1.1** Explain structure and function at multiple levels of organization	**S11.B.1.1.2** Compare and contrast the structural and functional similarities and differences among living things (e.g., classify organisms as herbivores, omnivores, carnivores; relationships between organisms)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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CONTENT Environmental Science – Gr. 11	STANDARDS	GRADE-LEVEL BENCHMARKS GRADE SPECIFIC CRITERIA	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES	ASSESSMENTS
How Ecosystems Work *Energy Flow in Ecosystems *The Cycling of Materials **TIME:** 4 Days	**S11.B.1.1** Explain structure and function at multiple levels of organization	**S11.B.1.1.3** Compare and contrast cellular processes (e.g., photosynthesis and cellular respiration)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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CONTENT Environmental Science – Gr. 11	STANDARDS	GRADE-LEVEL BENCHMARKS GRADE SPECIFIC CRITERIA	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES	ASSESSMENTS
The Organization of Life *Ecosystems: Everything is Connected *Evolution *The Diversity of Living Things **How Ecosystems Work** *Ecological Succession **TIME:** 4 Days	**S11.B.3.1** Use evidence or examples to explain the characteristics of and interactions within an ecosystem	**S11.B.3.1.1** Explain the significance of diversity in ecosystems	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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The Organization of Life *Ecosystems: Everything is Connected *Evolution *The Diversity of Living Things **How Ecosystems Work** *Energy Flow in Ecosystems *Cycling of Materials *Ecosystem Changes **TIME:** 4 Days	**S11.B.3.1** Use evidence or examples to explain the characteristics of and interactions within an ecosystem	**S11.B.3.1.2** Explain the biotic (i.e., plant, animal, and microbial communities) and abiotic (i.e., soil, air, temperature, and water) components of an ecosystem and their interaction	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations

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The Organization of Life *Ecosystems: Everything is Connected *Evolution *The Diversity of Living Things **How Ecosystems Work** *Energy Flow in Ecosystems *Cycling of Materials *Ecosystem Changes	**S11.B.3.1** Use evidence or examples to explain the characteristics of and interactions within an ecosystem	**S11.B.3.1.3** Describe how living organisms affect the survival of one another	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Biomes *Definition *Forest Biomes *Grassland, Desert, Tundra Biomes **TIME:** 8 Days	**S11.B.3.1** Use evidence or examples to explain the characteristics of and interactions within an ecosystem	**S11.B.3.1.4** Explain the similarities and differences in the major biomes (e.g., desert, tropical rain forest, temperate forest, coniferous forest, tundra) and the communities that inhabit them	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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CONTENT Environmental Science – Gr. 11	STANDARDS	GRADE-LEVEL BENCHMARKS GRADE SPECIFIC CRITERIA	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES	ASSESSMENTS
Understanding Populations *Size Change in Populations *Species Interactions **Biomes** *Limiting Factors **TIME:** 4 Days	**S11.B.3.1** Use evidence or examples to explain the characteristics of and interactions within an ecosystem	**S11.B.3.1.5** Predict how limiting factors (e.g., physical, biological, chemical factors) can affect organisms	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Understanding Populations *Size Change in Populations *Species Interactions **The Human Population** *Studying Human Populations *Changing Population Trends	**S11.B.3.2** Analyze patterns of change in natural or human-made systems over time	**S11.B.3.2.1** Use evidence to explain how cyclical patterns in population dynamics affect natural systems	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Biodiversity *Definition *Biodiversity at Risk *The Future of Biodiversity **TIME:** 6 Days	**S11.B.3.2** Analyze patterns of change in natural or human-made systems over time	**S11.B.3.2.2** Explain biological diversity as an indicator of a healthy environment	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Biodiversity *Definition *Biodiversity at Risk *The Future of Biodiversity **TIME:** 6 Days	**S11.B.3.2** Analyze patterns of change in natural or human-made systems over time	**S11.B.3.2.3** Explain how natural processes (e.g., seasonal change, catastrophic events, habitat alterations) impact the environment over time	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Nonrenewable Energy *Energy Resources and Fossil fuels *Nuclear Energy **Renewable Energy** **TIME:** 8 Days	**S11.B.3.3** Explain how human-made systems impact the management and distribution of natural resources	**S11.B.3.3.1** Describe different human-made systems and how they use renewable and nonrenewable natural resources (e.g., energy, transportation, distribution, management, and processing)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Water *Water Use and Management **Land** *Land Use *Land Management and Conservation **Food and Agriculture** *Feeding the World	**S11.B.3.3** Explain how human-made systems impact the management and distribution of natural resources	**S11.B.3.3.2** Compare and contrast the impact of management practices (e.g., production, processing, research, development, marketing, distribution, consumption, by-products) in meeting the need for commodities locally and globally	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Food and Agriculture *Feeding the World *Crops and Soil *Animals and Agriculture **TIME:** 6 Days	**S11.B.3.3** Explain how human-made systems impact the management and distribution of natural resources	**S11.B.3.3.3** Explain the environmental benefits and risks associated with human-made systems (e.g., integrated pest management, genetically engineered organisms, organic food production)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Mining & Mineral Resources *Minerals and Mineral Resources **Nonrenewable Energy** *Energy Resources and Fossil Fuels *Nuclear Energy **Renewable Energy** *Alternative Energy Sources	**S11.C.2.2** Demonstrate that different ways of obtaining, transforming, and distributing energy have different environmental consequences	**S11.C.2.2.1** Explain the environmental impacts of energy use by various economic sectors (e.g., mining, logging, transportation) on environmental systems)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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CONTENT Environmental Science – Gr. 11	STANDARDS	GRADE-LEVEL BENCHMARKS GRADE SPECIFIC CRITERIA	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES, ACTIVITIES AND EXPERIENCES	ASSESSMENTS
Renewable Energy *Renewable Energy Today *Alternative Energy and Conservation **TIME:** 6 Days	**S11.C.2.2** Demonstrate that different ways of obtaining, transforming, and distributing energy have different environmental consequences	**S11.C.2.2.2** Explain the practical use of alternative sources of energy (i.e., wind, solar, and biomass) to address environmental problems (e.g., air quality, erosion, resource depletion)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Renewable Energy *Renewable Energy Today *Alternative Energy and Conservation **Nonrenewable Energy** *Acid Precipitation *Greenhouse Effect	**S11.C.2.2** Demonstrate that different ways of obtaining, transforming, and distributing energy have different environmental consequences	**S11.C.2.2.3** Give examples of renewable energy resources (e.g., wind, solar, biomass) and nonrenewable resources (e.g., coal, oil, natural gas) and explain the environmental and economic advantages and disadvantages of their use	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Waste *Reducing Solid Waste *Hazardous Waste **The Environment and Human Health** *Pollution and Human Health *Biological Hazards **Economics, Policy, and the Future** **TIME:** 6 Days	**S11.D.1.2** Analyze how human-made systems impact the management and distribution of natural resources	**S11.D.1.2.1** Evaluate factors affecting availability, location, extraction, and use of natural resources	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Land Use **Waste Management** **Water Use & Management** **Renewable versus Non-renewable Resources** **TIME:** 6 Days	**S11.D.1.2** Analyze how human-made systems impact the management and distribution of natural resources	**S11.D.1.2.2** Explain the impact of obtaining and using natural resources for the production of energy and materials (e.g., resource renewal, amount of pollution, deforestation)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Water *Water Resources *Water Use and Management *Water Pollution	**S11.D.1.3** Explain the significance and contribution of water as a resource to living things and the shaping of the land	**S11.D.1.3.3** Explain factors (e.g., nutrient loading, turbidity, rate of flow, rate of deposition, biological diversity) that affect water quality and flow through a water system	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
TIME: 4 Days				
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Atmosphere and Climate Change *Climate and Climate Change *The Ozone Shield *Global Warming **TIME:** 4 Days	**S11.D.2.1** Analyze how the transfer of energy and substances between Earth's atmosphere and its surface influences regional or global weather or climate	**S11.D.2.1.1** Describe how changes in concentration of minor components (e.g., O_2, CO_2, ozone, dust, pollution) in Earth's atmosphere are linked to climate change	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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Atmosphere and Climate Change *Climate and Climate Change *The Ozone Shield *Global Warming **TIME:** 6 Days	**S11.D.2.1** Analyze how the transfer of energy and substances between Earth's atmosphere and its surface influences regional or global weather or climate	**S11.D.2.1.2** Compare the transmission, reflection, absorption, and radiation of solar energy to and by the Earth's surface under different environmental conditions (e.g., major volcanic eruptions, greenhouse effect, reduction of ozone layer; increased global cloud cover)	Laboratory activities Teacher demonstrations Research projects Worksheets Reinforcement and vocabulary worksheets Field activities Teacher-made lab activities Q&A sessions with partner Class discussion/debates Internet links Written stories, brochures, pamphlets Concept mapping Visual aids: charts, diagrams	Objective test Performance-based test Quizzes Homework Self-check Journal writing Oral presentations Quiz game Research projects Construct a labeled model Graph interpretations Map interpretations Essays Illustrations Lab write-ups Compose a story Construct a comic strip Power-point presentations
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