2014-2015 Instructional Curriculum Plan

Course: Environmental Science

Grade: 11-12

Topic/Idea: Unit 1 The Nature of Science – What is Science?

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Learning Goal: Students will understand the process of science, and be able to apply scientific principles to identify and solve problems.

Objectives: Students will be able to:
- Identify what is and isn't science.
- Differentiate between and give examples of: hypotheses, theories and laws.
- Explain and list examples that support the durability of science but emphasize that it is open to change.
- Identify the focus and importance of studying environmental science.
- List 3 ways scientific knowledge and problem solving benefit people.

Linked Standards with Access Points:

**Supporting LAFS and MAPS (as required by course description)**

- **SC.912.N.1.2#:** Describe and explain what characterizes science and its methods.
- **SC.912.N.1.3#:** Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking and the active consideration of alternative scientific explanations to explain the data presented.
- **SC.912.N.1.4#:** Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.
- **SC.912.N.1.5#:** Describe how scientific observations are drawn from scientific explanations.
- **SC.912.N.1.6#:** Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).
- **SC.912.N.1.7#:** Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.
- **SC.912.N.2.4#:** Explain that scientific knowledge is both durable and robust and also evolves over time.

Essential Content & Understanding:

- **FLINN Safety Exam**: 80% or higher (required)
- **Safety Contract**: Required
- Identify how population growth and our increased use of resources are key issues that influence the study of environmental science.
- Identify examples of scientific laws that describe relationships in the natural world.
- Compare and contrast the durability of hypotheses, theories and laws and explain their ability to change.
- Identify examples of scientific laws that describe relationships in the natural world.
- Recognize that a scientific theory is developed by repeated investigations of many scientists and agreement on the likely explanation.
- Identify different methods that scientists use in conducting research.
- Identify ways models are used in the study of science.

Essential Questions:

- What is Science?

Resources/Links:

- **titles on text resource disc**
- Classroom activities:
  - Theories
  - Sunsets, Souls & Senses
  - Bill Nye: Pseudoscience
- Awesome Resources
- Labs: [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)

Reading and Writing in Science:

- Write About It, p. 33 #33-34
open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability. SC.912.N.3.1#: Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.
Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/ Stimulus, and additional information.

Annually Assessed Benchmark(s):
SC.912.N.1.1#: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/ space science, and do the following:
1. pose questions about the natural world,
2. conduct systematic observations,
3. plan investigations,
4. use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),
5. communicate results of scientific investigations

EduSoft Mini-Assessment(s):

Date Range: Given during the instruction per the outline in this section

Key Vocabulary:
- Analysis
- Controlled experiment
- Dependent variable

Learning Goal: Students will understand the process of science, and be able to apply scientific principles to identify and solve problems.

Objectives: Students will be able to
- Effectively use metric measurement equipment to obtain quantitative data.
- Recognize safety hazards and take the necessary precautions during lab activities.
- Design and conduct an experiment using the scientific method.
- Considered costs and benefits when choosing a strategy for solving a problem.
- Write a complete lab report including the steps of the scientific method.

Linked Standards with Access Points:
Supporting LAFS and MAFS
(as required by course description)

SC.912.N.1.4#: Identify sources of information and assess their reliability according to the strict standards of scientific investigations.
SC.912.N.1.6#: Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.
SC.912.N.1.3#: Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.
SC.912.N.1.5#: Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.
SC.912.N.1.7#: Recognize the role of creativity in constructing scientific questions, methods, and explanations.
SC.912.N.2.4#: Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.
SC.912.N.2.5#: Describe instances in which scientists’ varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about

Essential Content & Understanding:
- Make clear distinctions between observations, inferences, and predictions. Give examples of each.
- Discuss the reliability of resources and the role of creativity in constructing scientific questions.
- Discuss the need for proper equipment use, procedures, and safety in the science lab.
- Identify and use proper tools to gather, analyze and interpret data. (metric system, charts, graphs etc.)
- Understand the role that technology holds to support data collection and analysis.
- Incorporate the use of the scientific method in the design and performance of an inquiry based lab.
- Recognize that an experiment must be repeatable in order for results to be considered valid.
- Identify and select appropriate independent (test) and dependent (outcome) variables that allow collection of quantitative data
- Discuss data collection and methods of organizing experimental data along with the importance of data analysis summaries

Essential Questions:
- How do scientists investigate a problem and report their findings?
- How can we insure that investigations are both safe and consistent with scientific principles?

Resources/Links:
* titles on text resource disc

Classroom activities:
- Lab Safety Video
- Metric Conversion Practice
- Awesome Resources

Labs: https://moodle.lake.k12.fl.us/
- Measurement Scavenger Hunt
- Inquiry- Scientific Method
*Can You Repeat that?
*Green vs. Conventional Cleaners

Reading and Writing in Science:
- Fixing the Hole in the Sky p. 3

2014-2015
### 2014-2015 Instructional Curriculum Plan

**Grade:** 11-12  
**Course:** Environmental Science  
**Topic/Idea:** Unit 1 B The Nature of Science – The Scientific Method

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Independent variable</th>
<th>Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.</td>
<td></td>
</tr>
</tbody>
</table>
### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

### Learning Goal:

Students will understand the process of science, and be able to apply scientific principles to identify and solve problems.

### Objectives:

Students will be able to:

- Identify the focus and importance of studying environmental science.
- List 3 factors that have greatly influence population growth in the last 100 years.
- Explain the impacts of population growth on our finite resources.
- List 3 examples each of renewable and non-renewable resources.
- Describe the concept of an ecological footprint and relate it to our need for sustainability
- Identify ways scientific knowledge and problem solving benefit people.

### Key Vocabulary:

- Environmental science
- Environmentalism
- Natural resource
- Renewable resource
- Nonrenewable resource
- Sustainable
- Ecological footprint

### Essential Questions:

What is your ecological footprint and why should you care?

### Resources/Links:

- * titles on text resource disc
- Classroom activities:
  - Comparing Ecological Footprints p. 10
  - Awesome Resources
  - *Finite Resources
  - *What’s Your Ecological Footprint?
- Reading and Writing in Science:
  - What do you think? p. 9
  - The Lesson of Easter Island p. 29

### Date Range:

Given during the instruction per the outline in this section

### Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description)**

| SC.912.E.6.6# | Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies. |
| SC.912.C.1.3# | Evaluate how environment and personal health are interrelated. |
| SC.912.L.17.16 | Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution. |
| SC.912.L.17.18# | Describe how human population size and resource use relate to environmental quality. |
| SC.912.L.17.20# | Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability. |
| SC.912.N.3.5# | Describe the function of models in science, and identify the wide range of models used in science. |

**Essential Content & Understanding:**

- Individuals and society as a whole must learn to use our resources sustainably or it will drastically affect life on our planet.
- Define and give examples of renewable and nonrenewable resources.
- Understand the concept of sustainability and apply it to our natural resources.
- Describe how ecological footprint size is directly related to the development stage of the country.
- Relate the “tragedy of the commons” to our world today.
- Describe how population growth and the depletion of resources have changed the environmental focus in the 21st century.
# 2014-2015 Instructional Curriculum Plan

**Grade:** 11-12

**Course:** Environmental Science

**Topic/Idea:** Unit 2 Sustaining Our World – Environmental Economics

## Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

## Learning Goal:

Students will understand that our lives and economies depend on the natural resources and services provided by our planet.

## Objectives:

Students will be able to:

- Define: Economics and list 3 examples of goods and services
- Identify how supply and demand and cost-benefit analysis contribute to decision making.
- Explain the importance of resource sustainability when making economic decisions

## Annually Assessed Benchmark(s):

- **SC.912.L.17.20#:** Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

## EduSoft Mini-Assessment(s):

- 

## Date Range:

Given during the instruction per the outline in this section

## Key Vocabulary:

- Cost-benefit analysis
- Demand
- Eco-labeling
- Economics
- Non-market value
- Supply

## Learning Focus Benchmarks

<table>
<thead>
<tr>
<th>Learning Focus</th>
<th>Supporting LAWS and MAPS (as required by course description)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SC.912.N.4.2W#:</strong></td>
<td>Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.</td>
</tr>
<tr>
<td><strong>SC.912.L.17.11#:</strong></td>
<td>Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.</td>
</tr>
<tr>
<td><strong>SC.912.L.17.12#:</strong></td>
<td>Discuss the political, social, and environmental consequences of sustainable use of land.</td>
</tr>
<tr>
<td><strong>SC.912.L.17.18#:</strong></td>
<td>Describe how human population size and resource use relate to environmental quality.</td>
</tr>
</tbody>
</table>

## Essential Content & Understanding:

- Understand how supply, demand and cost benefit analysis contribute to decision making.
- Understand the relationship between economics and its dependency on the environment.
- Differentiate between the three types of economies: centrally planned, free market and mixed.
- Explain the difference between economic growth and economic development.
- List and describe several methods used by economies to work toward sustainability and the benefits achieved by doing so.

## Essential Questions:

- How can we best balance our own interests and needs with the health of the environment?

## Resources/Links:

- **titles on text resource disc**
- 

## Classroom activities:

- Video: Wal-Mart’s Green Revolution
- Awesome Resources

## Labs:

- **http://moodle.lake.k12.fl.us/**
- Quick Lab: Cost Benefit Analysis  p. 37
- **Working Trees**

## Reading and Writing in Science:

- **Choose an Approach**
- Explore the Big Question p. 41
2014-2015 Instructional Curriculum Plan
Course: Environmental Science
Topic/Idea: Unit 2 B Sustaining Our World – Ethics & Environmental Policy

<table>
<thead>
<tr>
<th>Learning Goal: Students will understand that our lives and economies depend on the natural resources and services provided by our planet.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives: Students will be able to:</td>
</tr>
<tr>
<td>- Describe the role of ethics, culture and worldviews on the study of environmental science.</td>
</tr>
<tr>
<td>- Explain the purpose of environmental policy.</td>
</tr>
<tr>
<td>- Identify major national and international institutions involved in environmental policy.</td>
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<tr>
<td>- Explain different approaches to environmental policy.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supporting LAFS and MAFS (as required by course description)</th>
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</thead>
<tbody>
<tr>
<td>SC.912.L.16.10#: Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.</td>
</tr>
<tr>
<td>SC.912.N.4.1: Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.</td>
</tr>
<tr>
<td>SC.912.N.4.2#: Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.</td>
</tr>
<tr>
<td>SC.912.L.17.13#: Discuss the need for adequate monitoring of environmental parameters when making policy decisions.</td>
</tr>
<tr>
<td>SC.912.N.2.5#: Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Essential Content &amp; Understanding:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Explain the purpose of environmental ethics.</td>
</tr>
<tr>
<td>- Describe how a culture and worldview influence our interpretation of situations involving the environment.</td>
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<tr>
<td>- Explain the purpose of environmental policy and discuss how science, economics, ethics and politics are involved in environmental policy.</td>
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<tr>
<td>- Trace the history of environmental policy in the United States.</td>
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<tr>
<td>- What is the EPA and what is its job?</td>
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<tr>
<td>- List and describe 4 key acts or laws developed in the United States to protect our environment.</td>
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<tr>
<td>- Identify international organizations involved in environmental issues.</td>
</tr>
<tr>
<td>- Explain why it is important to have a world-wide program of international laws.</td>
</tr>
<tr>
<td>- Describe the different approaches to environmental policy.</td>
</tr>
<tr>
<td>- List the steps of creating a new environmental policy.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Essential Questions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do environmental policies protect the environment?</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Resources/Links:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>text resource disc</strong></td>
</tr>
<tr>
<td>Classroom activities:</td>
</tr>
<tr>
<td>Analyzing Plans p. 51</td>
</tr>
<tr>
<td><strong>Pending Legislation</strong></td>
</tr>
<tr>
<td><strong>Choose and Approach</strong></td>
</tr>
<tr>
<td><strong>Modeling Finite Resources</strong></td>
</tr>
<tr>
<td><strong>Local Research Studies</strong></td>
</tr>
<tr>
<td><strong>Awesome Resources</strong></td>
</tr>
<tr>
<td>Labs: <a href="http://moodle.lake.k12.fl.us/">http://moodle.lake.k12.fl.us/</a></td>
</tr>
<tr>
<td>Reading and Writing in Science:</td>
</tr>
<tr>
<td>Fighting for Clean Water p. 56-57</td>
</tr>
<tr>
<td>Cleaning the Tides p. 35</td>
</tr>
<tr>
<td>Resources:</td>
</tr>
<tr>
<td><a href="http://www.earthcharter.org">www.earthcharter.org</a></td>
</tr>
</tbody>
</table>
# 2014-2015 Instructional Curriculum Plan

## Course: Environmental Science

### Time Allowed:
- 6 Classes
- First Quarter

### Grade: 11-12

#### Topic/Idea: Unit 3 Dynamic Earth - Matter

<table>
<thead>
<tr>
<th>Instructional Focus Benchmarks</th>
<th>Learning Goal:</th>
<th>Objectives:</th>
<th>Linked Standards with Access Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.</td>
<td>Students will understand that the Earth is one interconnected system in which energy conversions underlie all physical, chemical and biological changes.</td>
<td>Students will be able to:</td>
<td>Supporting LAFS and MAFS (as required by course description)</td>
</tr>
<tr>
<td>Annually Assessed Benchmark(s):</td>
<td></td>
<td></td>
<td>SC.912.L.17.10#: Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle.</td>
</tr>
<tr>
<td>EduSoft Mini-Assessment(s):</td>
<td></td>
<td></td>
<td>SC.912.N.4.1#: Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society’s decision making.</td>
</tr>
<tr>
<td>Date Range: Given during the instruction per the outline in this section</td>
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<tr>
<td>Key Vocabulary:</td>
<td></td>
<td></td>
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<tr>
<td>Atom</td>
<td></td>
<td></td>
<td>Essential Content &amp; Understanding:</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td></td>
<td></td>
<td>- Compare and contrast atoms, elements, molecules, compounds and mixtures.</td>
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<tr>
<td>Compound</td>
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<td>- Describe how chemistry is the central link to not only understanding environment, but creating solutions to problems as well.</td>
</tr>
<tr>
<td>Element</td>
<td></td>
<td></td>
<td>- Review and relate atomic structure when describing organic and inorganic compounds and bonding between atoms.</td>
</tr>
<tr>
<td>Hydrocarbon</td>
<td></td>
<td></td>
<td>- Identify the four carbon based macromolecules and their functions in all living things.</td>
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<tr>
<td>Lipid</td>
<td></td>
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<td>- Describe how water’s unique properties make it essential to all life.</td>
</tr>
<tr>
<td>Macromolecule</td>
<td></td>
<td></td>
<td>- Diagram and describe the pH scale with respect to H+ concentration and the terms acid, base and neutral.</td>
</tr>
<tr>
<td>Matter</td>
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<td>- Describe how a change in pH can disrupt cell / life processes.</td>
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<tr>
<td>Molecule</td>
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<tr>
<td>Nucleic acid</td>
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<tr>
<td>pH</td>
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<td>Protein</td>
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<tr>
<td>Solution</td>
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</tbody>
</table>

### Essential Questions:
How will the knowledge of basic chemistry help you understand and explain environmental processes?

### Resources/Links:
- **text resource disc**

#### Classroom activities:
- Awesome Resources
- Labs: [Properties of Water Lab](http://moodle.lake.k12.fl.us/)
- [Macromolecules in Food Lab](http://moodle.lake.k12.fl.us/)

#### Reading and Writing in Science:
- A Closer Look: Nutrients p. 90-91
2014-2015 Instructional Curriculum Plan

Course: Environmental Science

Grade: 11-12

Time Allowed: 4 Classes
First Quarter

Learning Goal: Students will understand that the Earth is one interconnected system in which energy conversions underlie all physical, chemical, and biological changes.

Objectives: Students will be able to:
- Define energy and list examples of kinetic and potential energy.
- List, describe and give examples of the types of energy.
- Describe the process of energy conversion and give examples
- State and explain the First & Second Laws of Thermodynamics.
- Define and list examples of renewable and nonrenewable energy.
- Explain why energy goes from a more useful form to a less useful form.
- Understand that the Sun’s energy drives all life on Earth.

Linked Standards with Access Points:
- Supporting LAFS and MAFS (as required by course description)

Essential Content & Understanding:
- Define energy and differentiate between kinetic and potential energy.
- Be able to classify energy as being potential or kinetic.
- Identify the 6 different types of energy
- Describe how energy can be changed from one form to another (1st Law of Thermodynamics)
- Apply the Law of Conservation of Energy and the 2nd Law of Thermodynamics as they relate to a chemical change (such as the inefficient burning of fuels)
- Explain how the Sun’s energy provides all of the “fuel” for planet Earth

Essential Questions:
- What is energy and how is it used?

Resources/Links:
- ** text resource disc
- Awesome Resources
- Heat Lab
- Energy & Pendulums

Classroom activities:
- Quick Lab: Where’s the Energy? p. 520
- Reading and Writing in Science:
  - Explore the Big Question p. 521

Key Vocabulary:
- Chemical energy
- Combustion
- Electricity
- Energy
- First Law of Thermodynamics
- Kinetic energy
- Mechanical energy
- Nonrenewable energy
- Potential energy
- Renewable energy
- Second Law of Thermodynamics

Date Range: Given during the instruction per the outline in this section

EduSoft Mini-Assessment(s):

Anually Assessed Benchmark(s):

Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.
### 2014-2015 Instructional Curriculum Plan

**Course:** Environmental Science  
**Grade:** 11-12  
**Topic/Idea:** Unit 3 C Dynamic Earth – Earth’s Cycles

**Learning Goal:** Students will understand that the Earth is one interconnected system in which energy conversions underlie all physical, chemical and biological changes.

**Objectives:** Students will be able to:
- Explain how Earth's environment is composed of many interlinked systems
- Describe through example how the output of one system can be the input in another.
- Describe how negative feedback loops tend to stabilize a system where as positive feedback loops tend to do the opposite.
- Explain how the Law of Conservation of Matter applies to the behavior of nutrients in the environment
- Diagram and explain the biogeochemical cycles of an ecosystem, including water, phosphorus, carbon and nitrogen.

**Linked Standards with Access Points:**

<table>
<thead>
<tr>
<th>Supporting LAFS and MAFS (as required by course description)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC.912.L.17.20# - Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.</td>
</tr>
<tr>
<td>SC.912.L.17.10# - Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle.</td>
</tr>
<tr>
<td>SC.912.L.17.19# - Describe how different natural resources are produced and how their rates of use and renewal limit availability.</td>
</tr>
</tbody>
</table>

**Essential Content & Understanding:**
- Describe how Earth’s environment is composed of many complex interlinked systems.
- Identify how feedback loops work to stabilize or destabilize a system.
- Explain how loops act as positive or negative event cycles and the affect humans have on this system.
- State and explain the Law of Conservation of Matter and apply it to the function of nutrients in the environment.
- Explain the importance of the cycling of nutrients, both macro and micro to all life on Earth.
- Describe or diagram the carbon cycle and explain how it depends on photosynthesis and respiration.
- Describe or diagram the nitrogen cycle and identify the roles of bacteria in this cycle.
- Describe or diagram the phosphorus cycle and explain the impact humans have on this cycle.
- Trace the path of the hydrological cycle through the biosphere and link its cycle to that of the others.

**Essential Questions:**
- How do Earth’s systems and cycles sustain our planet?

**Resources/Links:**
- **text resource disc**
- Classroom activities:
  - Real-life examples of feedback loops
  - Group projects: Model or diagram Biogeochemical Cycles
  - Awesome Resources
- Labs: [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
  *Effects of CO2 on Plants*
  *Testing Water Quality*
  *Testing Soil Properties*
- Reading and Writing in Science:
  - A Ballooning Issue p. 96

**Key Vocabulary:**
- Atmosphere
- Biosphere
- Ecology
- Feed-back loop
- Geosphere
- Green-house gas
- Hydrosphere
- Lithosphere
- Ozone
- Troposphere
- Stratosphere
2014-2015 Instructional Curriculum Plan
Course: Environmental Science
Grade: 11-12
Time Allowed: 6 Classes
First Quarter

**Instructional Focus Benchmarks**
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

**Annually Assessed Benchmark(s):**
- SC.912.L.17.20#: Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

**EduSoft Mini-Assessment(s):**

**Date Range:** Given during the instruction per the outline in this section

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**Key Vocabulary:**
- Atmosphere
- Biosphere
- Ecology
- Feed-back loop
- Geosphere
- Green-house gas
- Hydrosphere
- Lithosphere
- Ozone
- Troposphere
- Stratosphere

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**Learning Goal:** Students will understand that the Earth is one interconnected system in which energy conversions underlie all physical, chemical and biological changes.

**Objectives:** Students will be able to:
- Identify Earth’s four spheres and describe their contributions to our planet’s life support system.
- Relate the goal of ecology to the understanding of the interactions in the biosphere.

**Linked Standards with Access Points:**

<table>
<thead>
<tr>
<th>Supporting LAFS and MAFS</th>
<th>(as required by course description)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC.912.L.3.5#:</td>
<td>Describe the function of models in science, and identify the wide range of models used in science.</td>
</tr>
<tr>
<td>SC.912.E.7.7#:</td>
<td>Identify, analyze, and relate the internal (Earth system) and external (astronomical) conditions that contribute to global climate change.</td>
</tr>
<tr>
<td>SC.912.E.7.8#:</td>
<td>Explain how various atmospheric, oceanic, and hydrologic conditions in Florida have influenced and can influence human behavior, both individually and collectively.</td>
</tr>
<tr>
<td>SC.912.L.17.19#:</td>
<td>Describe how different natural resources are produced and how their rates of use and renewal limit availability.</td>
</tr>
</tbody>
</table>

**Essential Content & Understanding:**
- Describe how Earth’s 4 spheres interact with each other to produce our planet’s life support system.
- Diagram and label the layers of the atmosphere.
- Identify the “functions” of each layer of the atmosphere as it relates to our life on Earth.
- List the components of Greenhouse gases and explain the function of ozone.
- Weather occurs in the troposphere.
- Describe the hydrosphere and trace the path of water through the hydrological cycle.
- Diagram the layers of the geosphere; the core, the mantle and the crust.
- Identify which part of the geosphere contains the natural resources we depend on.
- Explain the composition of the biosphere.
- Realize that the goal of ecology is to understand the interactions in the biosphere between the air, water, soil and living organisms.

**Essential Questions:**
- How does Earth’s life support system work?

**Resources/Links:**
- **text resource disc**
- Classroom activities: Foldable of Earth’s Spheres
- Awesome Resources
- Labs: [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
- Quick Lab: Distribution of Earth’s Water p. 80.
- *Effects of CO2 on plants.

**Reading and Writing in Science:**
- Nutrients p. 90-91
- Write About It #35 p. 95
# 2014-2015 Instructional Curriculum Plan

**Grade:** 11-12  
**Course:** Environmental Science  
**Topic/Idea:** Unit 4 Principles of Ecology – Ecosystem Components

## Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

## Annually Assessed Benchmark(s):

## EduSoft Mini-Assessment(s):

**Date Range:** Given during the instruction per the outline in this section

## Key Vocabulary:

- Abiotic factor
- Autotroph
- Biotic factor
- Carnivore
- Community
- Consumer
- Decomposer
- Detritivore
- Ecology
- Ecosystem
- Habitat
- Herbivore
- Heterotroph
- Omnivore
- Population
- Producer
- Resources
- Species

## Learning Goal:

Students will understand that life on Earth depends on interactions among organisms and between organisms and their environment.

## Objectives:

Students will be able to:

- List the levels of organization of matter in nature and give examples of each level.
- Define limiting factors; both biotic and abiotic and give examples of each.
- Explain how resources provided by a habitat give a community its basic structure.
- Describe how organisms are classified as producers or consumers. Give examples.
- Describe the energy processes of photosynthesis and respiration and the factors affecting each.
- Explain how an ecosystem is sustained by the cycling of nutrients and the energy flow through organisms.

## Linked Standards with Access Points:

### Supporting LAFS and MAFS (as required by course description)

- **SC.912.L.17.7#:** Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems.
- **SC.912.L.17.9#:** Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels.
- **SC.912.L.17.10#:** Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle.
- **SC.912.P.10.1#:** Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.
- **SC.912.P.10.2#:** Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.

## Essential Content & Understanding:

- Describe the different levels of organization studied by ecologists.
- Have a working knowledge of the vocabulary terms specific to these levels of organization. Be able to give examples.
- Define limiting factors both biotic and abiotic, and list examples of each.
- Explain how resources give a community its basic structure.
- Understand that all organisms have a range of tolerance to variations in their environment.
- Identify limiting factors that might affect population size.
- List examples of producers/autotrophs and describe their role in energy production.
- Identify the chemical equation for photosynthesis and describe factors that might influence its energy production.
- Describe where some organisms might use chemosynthesis and explain how it works.
- Classify organisms as consumers: herbivores, carnivores, omnivores, and detritivores.
- Describe the life process of respiration both with and without oxygen. Use proper terms.
- Know that ecosystems are sustained by the cycling of nutrients and the energy transfer from the sun to the biosphere.

## Essential Questions:

- What defines the environment we live in?

## Resources/Links:

- **Text resource disc**
- **Classroom activities:**
  - Awesome Resources
  - Go Outside: Abiotic & Biotic Factors  p. 102
  - **Life in a Drop of Pond Water**
  - **Mapping Kelp Forests**
  - Factors Affecting Photosynthesis
  - Chromatography of Plant Pigments

## Reading and Writing in Science:

- **Writing About It**  #32.  p. 123
### 2014-2015 Instructional Curriculum Plan

**Course:** Environmental Science  
**Grade:** 11-12  
**Topic/Idea:** Unit 4 B Principles of Ecology – Energy in Ecosystems

**Time Allowed:**
- **6 Classes**  
- **Second Quarter**

<table>
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<th>Key Vocabulary:</th>
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</table>
| Biomass  
Ecological efficiency  
Food chain  
Food web  
Keystone species  
Primary consumer  
Primary producer  
Primary productivity  
Pyramid of energy  
Pyramid of numbers  
Secondary consumer  | Trophic level |

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- Explain how the primary productivity in plants illustrates the concept of the 1st law of Thermodynamics  
- Define biomass and relate it to the trophic levels of an energy pyramid.  
- Identify a keystone species and explain how they can influence a community’s composition and structure. |

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<th>Essential Content &amp; Understanding:</th>
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</table>
| Explain how the primary productivity in plants illustrates the concept of the 1st law of Thermodynamics.  
Using a Florida ecosystem, diagram the trophic levels of a food chain and explain what happens to energy as it moves up an energy pyramid model.  
Identify Alligators as a Florida keystone species and describe their influence on their community.  
List factors that determine the net primary productivity of an area and relate those factors to areas, both terrestrial and aquatic, with the highest primary productivity. |

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<thead>
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<td>How does energy flow through communities?</td>
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<th>Resources/Links:</th>
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<tbody>
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<td><strong>text resource disc</strong></td>
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<table>
<thead>
<tr>
<th>Classroom activities:</th>
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</thead>
</table>
| Real data: Energy Flow in Communities p. 144  
Web Quest - Energy in an Ecosystem  
Energy in Ecosystems Activity  
Awesome Resources  
Labs:  
Measuring the Primary Productivity of Grass  
**Life in a drop of water**  
**Mapping Kelp Forests** |

<table>
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<th>Reading and Writing in Science:</th>
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<tr>
<td>Write About It: # 33 p. 161</td>
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**Date:** November 10, 2014  
**Time:** 12:00 PM

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**2014-2015**
# Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

### Annually Assessed Benchmark(s):

### EduSoft Mini-Assessment(s):

### Date Range: Given during the instruction per the outline in this section

### Key Vocabulary:
- Biodiversity
- Ecosystem diversity
- Genetic diversity
- Species diversity
- Taxonomical key

---

## Learning Goal:

Students will understand the benefits of biodiversity and explain the role of evolution in its development.

### Objectives:

- Define: Biodiversity and explain why it is a vital renewable resource.
- Explain how species are classified and how species diversity is difficult to measure.
- Infer how genetic diversity increases the overall species diversity through natural selection.
- Describe ecosystem diversity and the benefits of the varied habitats supporting different species.
- List 3 benefits of biodiversity
- Describe how the functional diversity of ecosystems sustains life on our planet

### Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description)

**SC.912.L.15.3#:** Describe how biological diversity is increased by the origin of new species and how it is decreased by the natural process of extinction.

**SC.912.L.17.11#:** Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.

### Essential Content & Understanding:

- Know that species diversity is the most commonly used measure of the biodiversity of an area.
- Describe and demonstrate how to use a taxonomical key to classify organisms.
- Relate genetic diversity to the specific adaptations to local conditions
- Identify some of Florida’s diverse ecosystems, i.e: wetlands, pine forest, beaches, prairie, etc
- List examples of how biodiversity varies across taxonomic groups and geographical regions.
- List reasons why it is difficult to assess the true population size of a species.
- Describe the valuable services ecosystems provide.
- Relate the stability of an ecosystem to its biodiversity level.

### Essential Questions:

- What is biodiversity and why is it important?

### Resources/Links:

**Resources/Links:** **text resource disc

**Classroom activities:**
- Bill Nye: Biodiversity
- Create a Critter
- Awesome Resources

**Labs:** [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)

**Exploring Plant Diversity**
- Go Outside: Who’s in the water? p. 183
  - Using a Dicotomous Key

### Reading and Writing in Science:

- Critical Thinking: # 27 p. 223
2014-2015 Instructional Curriculum Plan
Grade: 11-12
Course: Environmental Science

Topic/Idea: Unit 5 B Planet of Life – Evolution & Speciation

Learning Goal: Students will understand the benefits of biodiversity and explain the role of evolution in its development.

Objectives: Students will be able to
- Identify, compare and contrast the 4 primary mechanisms of biological evolution.
- List and describe the conditions required for natural selection to occur.
- Differentiate between natural selection and artificial selection.
- Explain the process of speciation and how it, along with extinction, produces the diversity of life on Earth.

Linked Standards with Access Points:
- SC.912.L.15.3#: Describe how biological diversity is increased by the origin of new species and how it is decreased by the natural process of extinction.

Essential Content & Understanding:
- Describe the factors that affect the evolution of a species.
- Explain changes in the gene pool caused by mutations, migration, genetic drift or natural selection.
- List and explain the conditions that must be met for natural selection to occur.
- Understand and list evidence that supports the theory of natural selection.
- Identify how the human factor has controlled the development of many species through artificial selection.
- Explain how geographic isolation creates specialization, or the evolution of a genetically divergent population.
- Understand that the main cause of the extinction of a species is too rapid of a change in environmental conditions, resulting in the inability of a species to adapt.

Essential Questions:
Where do new species come from?

Resources/Links:
**  text resource disc
Classroom activities:
Bill Nye: Evolution
Natural Selection Online Game
Awesome Resources
Labs: http://moodle.lake.k12.fl.us/
Quick Lab: Successful Succession?  p. 152
**Simulating Adaptations

Reading and Writing in Science:
Write About It: Applying the Big Question  #34  p. 161
## 2014-2015 Instructional Curriculum Plan

**Course:** Environmental Science  
**Grade:** 11-12  
**Time Allowed:** 4 Classes  
**Second Quarter**

**Topic/Idea:** Planet of Life – Unit 5 C Extinction & Preventing Biodiversity Loss

### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

### Annually Assessed Benchmark(s):

### EduSoft Mini-Assessment(s):

### Date Range:

Given during the instruction per the outline in this section

### Key Vocabulary:

- Endangered species
- Endemic
- Extinction
- Extirpation
- Habitat fragmentation
- Invasive species
- Mass extinction
- Poaching

### Learning Goal:

Students will understand the benefits of biodiversity and explain the role of evolution in its development.

### Objectives:

Students will be able to:

- Describe how biodiversity is monitored and explain current trends world-wide and specific to Florida.
- Explain the Living Planet Index and apply it to past and present population.
- Compare and contrast endangered and threatened species. Use specific examples in Florida.
- Identify the factors that are causing a loss in our planet’s biodiversity both in organisms and in habitat.
- Identify strategies used to monitor and protect biodiversity in species, ecosystems and the world.

### Linked Standards with Access Points:

**Supporting LAFS and MAFS**  
(as required by course description)

- SC.912.L.15.3#: Describe how biological diversity is increased by the origin of new species and how it is decreased by the natural process of extinction.
- SC.912.L.17.8#: Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.

### Essential Content & Understanding:

- Differentiate between an endangered species and a threatened species. List examples in Florida.
- Use the WWF’s Living Planet Index, to show that extinction is on the rise.
- List examples of how human population growth is threatening our planet’s biodiversity.
- Identify the problems caused by invasive species. Use the boa in the Everglades as an example.
- Explain the basic components of the Endangered Species Act and the CITES treaty.
- List an example of a species “saved” through a Species Survival Plan.
- Identify strategies used to protect species through both habitat and ecosystem approaches.

### Essential Questions:

- Why is it important to protect biodiversity?

### Resources/Links:

**titles on text resource disc**  
**Classroom activities:**
- **Endangered Species**  
- **Invasive Organisms Near You**
  - [Awesome Resources](http://moodle.lake.k12.fl.us/)
- **Over Harvesting**

### Labs:

- [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)

### Reading and Writing in Science:

- Write About It. p. 33 #33-34

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**2014-2015**
### Course: Environmental Science  
**Grade:** 11-12  
**2 Classes**  
**Second Quarter**

**Learning Goal:** Students will understand that life on Earth depends on interactions among organisms and between organisms and their environment.

**Objectives:** Students will be able to:
- Describe the factors that influence an organism’s niche.
- List examples from Florida ecosystems of predation, parasitism and herbivory.
- Explain how coevolution relationships can evolve over time.
- Describe symbiotic relationships and identify examples of each.

**Linked Standards with Access Points:**

**Supporting LAFS and MAFS (as required by course description)**

**SC.912.L.17.5#:** Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.

**SC.912.L.17.6#:** Compare and contrast the relationships among organisms, including predation, parasitism, competition, commensalism, and mutualism.

**SC.912.L.17.8#:** Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.

**Essential Content & Understanding:**

- Explain the roles of tolerance and competition and their affect on where and how an organism lives.
- Discuss how resource partitioning decreases competition between species.
- Use examples from Florida ecosystems to illustrate predator–prey relationships and organisms that practice herbivory or parasitism.
- Describe how predation can lead to the evolution of adaptations that enable an organism to better survive.
- Identify the symbiotic relationships between organisms such as: mutualism, commensalism and parasitism and be able to give examples of each.

**Essential Questions:**

How do interactions among organisms affect their ability to survive?

**Resources/Links:** **text resource disc**

- **Classroom activities:** Symbiosis Matching Cards  
  Awesome Resources
- **Labs:** [http://moodle.lake.k12.fl.us/Herbivory Lab](http://moodle.lake.k12.fl.us/Herbivory Lab)
- **Reading and Writing in Science:** Applying the Big Question # 34 p. 161
# Instructional Curriculum Plan

**Course:** Environmental Science  
**Grade:** 11-12  
**Time Allowed:** 4 Classes  
**Second Quarter**

## Topic/Idea: Unit 6B Population Dynamics – Describing Populations

### Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

### Annually Assessed Benchmark(s):

### EduSoft Mini-Assessment(s):

### Date Range: Given during the instruction per the outline in this section

### Key Vocabulary:
- Age structure  
- Age structure diagram  
- Population  
- Population density  
- Population distribution  
- Population size  
- Sex ratio

### Learning Goal:
Students will understand that life on Earth depends on interactions among organisms and between organisms and their environment.

### Objectives:
Students will be able to:
- Identify 3 methods of determining the population size.  
- Use the proper method to determine the populations of organisms with different geographical dispersion patterns.  
- Explain, using examples, the difference between population size, density and distribution.  
- Describe 3 types of population distribution  
- Interpret age and sex ratio diagrams to determine the growth status of a population.

### Linked Standards with Access Points:
Supporting LAFS and MAFS  
SC.912.L.17.1#: Discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution.

### Essential Content & Understanding:
- Describe the following methods of counting a population: sampling, capture-mark-release, direct observation, and indirect observation.  
- In a mock scenario, identify which method of counting a population would be the best to use.  
- Calculate the population density of an area when given appropriate data.  
- Diagram and give examples of the three different types of population distribution; random, uniform and clumped.  
- Use age structure and sex ratio diagrams to draw conclusions about future population growth.

### Essential Questions:
Why characteristics make up a population?

### Resources/Links:
- **Text resource disc**
- **Classroom activities:**
  - Bill Nye: Populations  
  - Awesome Resources  
- **Labs:**
  - [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)  
  - **Migrating Populations**  
  - **Using Mark-and-Recapture**  
  - Lab: Estimating Population Size  
  - Lab: Population Duckweed

### Reading and Writing in Science:
Write About It. #33 p. 123
## Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

**Annually Assessed Benchmark(s):**

- SC.912.L.17.5#: Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.

**EduSoft Mini-Assessment(s):**

**Date Range:** Given during the instruction per the outline in this section.

### Key Vocabulary:
- Biotic potential
- Carrying capacity
- Density-dependent factor
- Density-independent factor
- Emigration
- Exponential growth
- Immigration
- Migration
- Survivorship curve

## Learning Goal:

Students will understand that life on Earth depends on interactions among organisms and between organisms and their environment.

### Objectives:

- Identify the four characteristics of a population that scientists study in relation to population growth.
- Explain how fertility rate, age structure and sex ratios help define a population’s growth potential.
- Identify factors that affect population growth.
- Use real time Florida data to identify methods of calculating population growth and determine whether the growth is exponential or logistical.

## Standards:

### Supporting LAFS and MAFS (as required by course description)

- SC.912.L.17.1#: Discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution.

## Essential Content & Understanding:

- Identify how scientists determine population growth.
- Explain how fertility rate, age structure and sex ratios help define a population’s growth potential.
- Relate population growth to carrying capacity and factors such as immigration, emigration, births, deaths, and limiting factors.
- Compare density dependent and density independent factors. Give examples.
- Relate the growth of a population to the biotic potential of an organism.
- When given sample data, calculate the population growth, graph the data and determine whether the growth is exponential or logistical.
- Explain the concept of a survivorship curve using real time data.

## Essential Questions:

Why is it important to keep track of population growth?

### Resources/Links:

**Resources/Links:** **text resource disc**

### Classroom activities:

- Real Data: Turkey Vultures p. 112
- Awesome Resources
- Fox & Rabbit Population Lab
- Yeast Population Growth

### Reading and Writing in Science:

- Write About It. p. 123 #34
- The Cloudless Forest p. 118-119
### 2014-2015 Instructional Curriculum Plan

**Grade:** 11-12  
**Course:** Environmental Science  
**Topic/Idea:** Unit 6 D Population Dynamics – Community Stability  
**Time Allowed:** 2 Classes  
**Second Quarter**

#### Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

#### Annually Assessed Benchmark(s):

#### EduSoft Mini-Assessment(s):

#### Date Range:
Given during the instruction per the outline in this section

#### Key Vocabulary:
- Invasive species
- Pioneer species
- Primary succession
- Secondary succession
- Succession

#### Learning Goal:
Students will understand that life on Earth depends on interactions among organisms and between organisms and their environment.

#### Objectives:
Students will be able to:
- Explain the difference between primary and secondary succession and give examples when each might occur.
- Identify and predict changes in Florida ecosystems related to seasons, climate change, natural disasters and succession
- Explain the disruptive impact an invasive species can have on a community. Use specific examples from Florida.

#### Standards:
- **Supporting LAFS and MAFS (as required by course description)**
  
| SC.912.L.17.4# | Describe changes in ecosystems resulting from seasonal variations, climate change and succession. |

#### Essential Content & Understanding:
- Explain how disturbances can through a community out of this balanced state and into a period of adjustment
- List examples of primary and secondary succession and describe the stages
- Identify the factors that determine the type of succession that will occur.
- Identify a pioneer species and list several examples in different ecosystems.
- Describe the how, when and where of climax communities.
- Identify problems caused by the introduction of invasive species.
- List examples of invasive species in Florida and explain how they are affecting the communities they have invaded.

#### Essential Questions:
- How do communities respond to a disturbance?

#### Resources/Links:
- **text resource disc**
- Classroom activities:
  - Video: Fire!
  - Pond Succession
  - Awesome Resources
- Labs: [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
- **Quick Lab:** Successful Succession? p. 152
- **Reading and Writing in Science:**
  - What do you think? p. 183
### 2014-2015 Instructional Curriculum Plan

**Grade:** 11-12  
**Course:** Environmental Science  
**Topic/Idea:** Unit 7 A Our Biosphere – Climatic Influences

**Instructional Focus Benchmarks**  
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

**Annually Assessed Benchmark(s):**

**EduSoft Mini-Assessment(s):**

**Date Range:** Given during the instruction per the outline in this section

**Key Vocabulary:**
- Climate
- Greenhouse effect
- Greenhouse gas
- Thermohaline circulation
- El Nino
- Topography
- Weather

### Learning Goal:
Students will understand the importance of biome diversity and will be able to describe factors that influence their global locations and diversity of their inhabitants.

**Objectives:**
- Describe the different forms of heat transfer and how they affect air masses and essentially our weather.
- Differentiate between climate and weather.
- Identify Earth’s 3 main climate zones and describe other factors that might influence the type of climate in an area.
- Describe the atmospheric, oceanic and hydrological conditions unique to Florida and how they affect the human population that lives here.

**Linked Standards with Access Points:**
- **Supporting LAFS and MAFS (as required by course description)**
  - [SC.912.L.17.4#](#): Describe changes in ecosystems resulting from seasonal variations, climate change and succession.
  - [SC.912.E.7.7#](#): Identify, analyze, and relate the internal (Earth system) and external (astronomical) conditions that contribute to global climate change.
- [SC.912.E.7.8#](#): Explain how various atmospheric, oceanic, and hydrological conditions in Florida have influenced and can influence human behavior, both individually and collectively.
- [SC.912.E.7.9#](#): Cite evidence that the ocean has had a significant influence on climate change by absorbing, storing, and moving heat, carbon, and water.

**Essential Content & Understanding:**
- Explain the factors that affect the uneven heating of the planet by the sun.
- Understand the impact of uneven heating in terms of weather conditions, water currents and winds.
- Identify how the tilt of the Earth’s axis affects our seasons, weather and climate.
- Relate the oceans ability to absorb carbon dioxide to its cooling effect of the atmosphere and its affect on ocean circulation, climates, and weather.
- Identify and give examples of the effects of topography, vegetation and volcanic eruptions on weather and climate.
- Describe the factors that influence Florida’s unique climate and weather patterns.
- Compare and contrast El Nino and La Nina and explain how they affect the Central Florida area.

**Essential Questions:**
- How does climate affect life on Earth?

**Resources/Links:**
- **text resource disc**
- **Classroom activities:**
  - Awesome Resources
- **Labs:**
  - [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
  - Does Latitude Affect the Sun’s Rays? p. 486
  - **Tracking CO2 and Temperature Heat Transfer Lab**
  - Inquiry Lab: How do the different surfaces of Earth absorb and retain heat?

**Reading and Writing in Science:**
- Climate Clues in Ice p. 508-509
  - Explore the Big Question. p. 490 #5
### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

#### Annually Assessed Benchmark(s):

#### EduSoft Mini-Assessment(s):

#### Date Range: Given during the instruction per the outline in this section

#### Key Vocabulary:
- Biome
- Coniferous
- Deciduous
- Estivation
- Hibernation
- Permafrost

### Learning Goal:

Students will understand the importance of biome diversity and will be able to describe factors that influence their global locations and diversity of their inhabitants.

### Objectives:

Students will be able to:
- Explain how the unique properties of water enable our planet to sustain life.
- Describe how biomes are characterized and relate Earth’s 3 main climate zones to the terrestrial biomes.
- Explain how net primary productivity varies geographically with latitude, temperature and precipitation.
- Be able to identify and describe Earth’s six terrestrial biomes as to climate, flora and fauna.
- Identify the basic characteristics of terrestrial ecosystems in Florida.
- Understand the importance of the biodiversity found in Earth’s biomes and ecosystems.

### Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description)**

<table>
<thead>
<tr>
<th>Standard</th>
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<tbody>
<tr>
<td>SC.912.L.17.4#</td>
</tr>
<tr>
<td>SC.912.L.17.7#</td>
</tr>
<tr>
<td>SC.912.L.17.8#</td>
</tr>
</tbody>
</table>

### Essential Content & Understanding:

- Review the properties of water that make our planet unique in its ability to sustain life.
- Compare and contrast the productivity of the different biomes and relate their efficiency to their geographical locations.
- Identify and describe the distinguishing characteristics of Earth’s biomes and terrestrial ecosystems.
- List examples of adaptations of organisms that enable them to survive in their specific biomes and ecosystems.
- Identify the basic characteristics of terrestrial ecosystems in Florida.
- Describe what conditions in Florida affect the location of these different ecosystems.
- Identify the relationship between the health of terrestrial ecosystems and the aquatic ecosystems around or near them.

### Essential Questions:

- What are the characteristics of Earth’s Biomes?

### Resources/Links:

**titles on text resource disc**

- **Classroom activities:**
  - Biome Brochures
  - Internet “field trips.”
  - Awesome Resources
- **Labs:**
  - [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
  - Climatogram Activity
- **Reading and Writing in Science:**
  - Too Much of a Good Thing? p.163
  - Should Elephant Culling Be Allowed? p.192-193
# Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

## Annualy Assessed Benchmark(s):

**EduSoft Mini-Assessment(s):**

Date Range: Given during the instruction per the outline in this section

## Key Vocabulary:

- Aphotic zone
- Benthic zone
- Estuary
- Flood plain
- Littoral zone
- Limnetic zone
- Photic zone
- Upwelling
- Wetland

## Learning Goal:

Students will understand the importance of biome diversity and will be able to describe factors that influence their global locations and diversity of their inhabitants.

## Objectives:

- Identify the basic characteristics of aquatic ecosystems in Florida
- Differentiate between the two main types of aquatic ecosystems – fresh water and marine
- Describe moving and standing fresh water ecosystems and adaptations of organisms that inhabit them.
- Identify the 3 major ocean zones and organisms unique to each.
- Describe the unique habitats of Florida’s coastal waters and the ecological and economical importance of estuaries.

## Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description)**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
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<tbody>
<tr>
<td>SC.912.L.17.4#</td>
<td>Describe changes in ecosystems resulting from seasonal variations, climate change and succession.</td>
</tr>
<tr>
<td>SC.912.L.17.7#</td>
<td>Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems.</td>
</tr>
<tr>
<td>SC.912.L.17.8</td>
<td>Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.</td>
</tr>
</tbody>
</table>

## Essential Content & Understanding:

- Identify how scientists classify aquatic ecosystems by their salinity, depth and water movement.
- Diagram and describe the life zones of both fresh water and marine ecosystems. List examples of organisms found in each.
- Describe the ecological importance of wetlands and estuaries, not only environmentally, but commercially as well.
- Describe an estuary ecosystem. List examples of the unique benefits it provides and examples of special adaptations needed for organisms to survive there.
- Relate the destruction of hurricane Katrina to the removal and “remodeling” of the estuary at the mouth of the Mississippi.
- Identify the role of the Everglades in protecting not only South Florida, but the offshore reefs as well.
- Explain the role of currents as they cycle water of different temperatures both around the planet and through the vertical column of water.
- List the conditions required for coral reef formation and explain why they are often called the “rainforest” of the ocean.

## Essential Questions:

- What components make up aquatic ecosystems?

## Resources/Links:

**Awesome Resources**

- **Labs:** [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
- **Mapping Kelp Forests**
- **Inquiry Lab: Brine Shrimp and Salinity**

## Reading and Writing in Science:

- What do you think? p. 187
- Think it Through. #5 p. 191
Course: Environmental Science


Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

Annually Assessed Benchmark(s):
SC.912.L.17.5#: Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.

EduSoft Mini-Assessment(s):

Date Range: Given during the instruction per the outline in this section

Key Vocabulary:
Demography
Demographic transition model
Growth rate
Industrial revolution
Infant mortality
Life expectancy

Learning Goal: Students will understand how human population growth and advances in technology have increased our impact on the environment.

Objectives: Students will be able to:
- Explain how technological advances in agriculture and industry triggered the World’s human population growth.
- Explain how fertility rate, age structure, sex ratios, movement and limiting factors affect and define a population’s growth potential.
- Identify the two main social factors that seem to determine a nation’s population growth and resource use.
- Use real time Florida data to identify methods of calculating population growth and determine whether the growth is exponential or logistical.
- Use real time World data to describe a demographic transition and how economic growth can lead to social change and other factors that might affect population growth.

Linked Standards with Access Points:
Supporting LAFS and MAFS (as required by course description)
SC.912.L.17.1#: Discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution.
SC.912.N.3.5#: Describe the function of models in science, and identify the wide range of models used in science.

Essential Content & Understanding:
- Trace the path of human population growth from the hunter-gatherer of 10,000 years ago to today.
- Explain how life changed through the development of agriculture and industrialization.
- List and explain the factors that demographers use to describe the human population.
- List examples as to why the world population continues to grow though growth rate has decreased.
- Compare population growth rates between different regions and explain how social factors affect growth and resource use.
- Utilize the demographic transition model to explain the drop in birth and death rates.

Essential Questions:
Have we exceeded our planet’s carrying capacity?

Resources/Links: 
** text resource disc

Classroom activities:
Video: People Paradox
Real Data: Population Growth Rates p.230
*Interpreting Age Structure
Awesome Resources
http://moodle.lake.k12.fl.us/
**Using Census Data
**Longevity
Quick Lab: Build and Compare Age Structure Diagrams p. 23

Reading and Writing in Science:
Write About It. #35-38 p. 253
The United States Census p. 248
### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

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<tr>
<td>SC.912.L.17.20#: Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.</td>
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### EduSoft Mini-Assessment(s):

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<th>Date Range: Given during the instruction per the outline in this section</th>
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### Key Vocabulary:

- Affluent society
- Technology
- Wealth gap

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## Learning Goal:

Students will understand how human population growth and advances in technology have increased our impact on the environment.

### Objectives:

- Compare and contrast the effects of population growth within affluent and poor societies.
- Relate the concept of Ecological footprint to world-wide population growth.
- List and explain several positive and negative impacts of technology.
- Identify how technology has specifically affected Florida.

### Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description)**

- SC.912.L.16.10#: Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.
- SC.912.L.17.20#: Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

### Essential Content & Understanding:

- Describe why affluent societies tend to have the most impact on the environment.
- Discuss how governments can be overwhelmed by population growth in poor societies.
- List examples of how land overuse and excessive land clearing are spin offs of a meeting a poor societies survival needs.
- Explain how the gap in the wealth gap both in the world and within societies causes an unequal distribution of the world’s resources.
- Describe how the development of nations affects ecosystems and the human quality of life.
- Describe the pros and cons of technology as related to both our environmental impact and its reduction.
- List examples of technologies and their specific impacts in Florida.

### Essential Questions:

- What impact do people have on the environment?

### Resources/Links:

- **titles on text resource disc**
- Classroom activities:
  - Video: The Lorax
  - Awesome Resources
  - Labs: [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
- Reading and Writing in Science:
  - China’s One Child Policy  p. 227
### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

### Annually Assessed Benchmark(s):

- **SC.912.L.17.20#:** Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

### EduSoft Mini-Assessment(s):

### Date Range: Given during the instruction per the outline in this section

### Key Vocabulary:
- Heat island
- Infrastructure
- Land cover
- Land use
- Rural area
- Sprawl
- Urban area
- Urbanization

### Learning Goal:

**Students will understand how human population growth and advances in technology have increased our impact on the environment.**

**Objectives:** Students will be able to:
- Differentiate between land use and land cover and describe how people affect both.
- Compare and contrast rural and urban areas.
- Explain urbanization and how increases in the human population tend to increase urbanization as well.
- Identify factors that might influence the development of an urban area and add to urban sprawl.
- List the environmental impacts of urbanization, both positive and negative.
- Explain how sprawl affects transportation, pollution, public health and the economics of an area. Use examples from Florida when possible.

### Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description):**
- **SC.912.L.17.13**: Discuss the need for adequate monitoring of environmental parameters when making policy decisions.
- **SC.912.L.17.16#:** Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.
- **SC.912.L.17.18#:** Describe how human population size and resource use relate to environmental quality.

### Essential Content & Understanding:

- Describe the different types of land cover and explain how it can affect how the land is used.
- Compare and contrast rural and urban living. Why did people move to the cities?
- Explain why transportation essential to the development and growth of the urban environment.
- Identify patterns of sprawl and describe how they impact metropolitan areas and the environment around them.
- Describe the environmental impacts of urbanization, both positive and negative.
- Explain how sprawl affects transportation, pollution, public health and the economics of an area. Use examples from Florida when possible.

### Essential Questions:

- How can we balance our needs for housing and jobs with that of the environment?

### Resources/Links:

**titles on text resource disc**

**Classroom activities:**
- Awesome Resources

**Labs:**
- [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
- Urbanization Lab / Mapping Ideas
- **Local Land Cover**
- **Patterns of Sprawl**

**Reading and Writing in Science:**
- Geographic Information Systems p. 314-315
- Reflection on lab activity - Urbanization
### 2014-2015 Instructional Curriculum Plan

**Course:** Environmental Science  
**Grade:** 11-12  
**Topic/Idea:** Unit 8 D The Human Population – Health & Hazards

#### Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

#### Learning Goal:
Students will understand how human population growth and advances in technology have increased our impact on the environment.

#### Objectives:
Students will be able:
- List and describe the different types of environmental health hazards
- Describe the reasons why individuals respond differently to the same environmental hazards
- Explain the spread of disease and how monitoring and control is essential for public health
- Identify types of chemical hazards and describe their effects on humans and the environment
- Discuss biomagnification and how toxins enter our food supply
- Explain how natural disasters can affect our health and quality of life.

#### Essential Content & Understanding:
- Compare and contrast epidemiology and toxicology. Explain how they help us understand about how environmental hazards might affect our health.
- Know that individuals respond differently to all types of exposure due to their unique differences in age, sex, weight, health issues and genetic makeup
- List 4 ways that infectious diseases are spread, methods used to reduce risk of exposure and monitor the outbreak.
- Describe some of the chemical hazards that are in our outside air, water and land. Explain their sources, how we might be exposed, and the effects on our health.
- Describe the threat of bioaccumulation in organisms and give examples.
- Describe how natural disasters can affect our environment and our health.

### Key Vocabulary:
- Bioaccumulation
- Biomagnification
- Carcinogen
- Dosage response relationship
- Emerging disease
- Hazard
- Infectious disease
- Pathogen
- Pollution
- Toxicology
- Risk assessment

### Linked Standards with Access Points:
**Supporting LAFS and MAFS**
(as required by course description)

- HE.912.C.1.3#
- HE.912.C.1.4#
- SC.912.L.14.6#
- SC.912.L.17.13#
- SC.912.L.17.14#
- SC.912.L.17.18#

### Essential Questions:
How does the environment’s health affect our own?

### Resources/Links:
**Text resource disc**

**Classroom activities:**
- Research: Hazardous Waste
- Videos: Hurricane Katrina
- Predicting Earthquakes p.278
- Awesome Resources

**Labs:**
- http://moodle.lake.k12.fl.us/
  - **Tracking an Outbreak**
  - **Home Hazmat Survey**
  - **Testing For Lead**
  - **Water Quality Testing**
  - **Quick Lab:** How Do Diseases Spread? p.263

**Reading and Writing in Science:**
- What do you think? p. 258
- The Rise and Fall of DDT p. 255
- Should BPA Be Regulated? p. 284-285
- Think It Through p. 276

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**Time Allowed:**
- 4 Classes
- Third Quarter

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**2014-2015 Instructional Curriculum Plan**  
**Course:** Environmental Science  
**Grade:** 11-12  
**Topic/Idea:** Unit 9A Resource Management – Forestry  
**Time Allowed:** 4 Classes  
**Third Quarter**

<table>
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<table>
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<tbody>
<tr>
<td>Adaptive management</td>
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<td>Clear cutting</td>
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<td>Deforestation</td>
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<tr>
<td>Ecosystem based management</td>
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<td>Maximum sustainable yield</td>
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<td>Prescribed burn</td>
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<td>Salvage logging</td>
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<td>Seed tree approach</td>
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<td>Selection system</td>
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<td>Sustainable forestry certification</td>
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<tr>
<th>Learning Goal:</th>
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<tr>
<td>Students will understand that our planet’s survival depends on our developing practices that enable us to use resources sustainably.</td>
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<tr>
<th>Objectives:</th>
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<tbody>
<tr>
<td>Students will be able:</td>
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<tr>
<td>- Explain the importance of managing specific renewable resources such as water, soil, animals and timber.</td>
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<tr>
<td>- Describe three different resource management approaches and their goals.</td>
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<tr>
<td>- Identify methods used to strike a balance between the ecological and economic values of our resources.</td>
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<tr>
<td>- Identify and explain methods used to harvest timber sustainably.</td>
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<tr>
<th>Linked Standards with Access Points:</th>
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<tbody>
<tr>
<td>Supporting LAFS and MAFS (as required by course description)</td>
</tr>
<tr>
<td>SC.912.L.17.11#: Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.</td>
</tr>
<tr>
<td>SC.912.L.17.12#: Discuss the political, social, and environmental consequences of sustainable use of land.</td>
</tr>
<tr>
<td>SC.912.L.17.13#: Discuss the need for adequate monitoring of environmental parameters when making policy decisions.</td>
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<thead>
<tr>
<th>Essential Content &amp; Understanding:</th>
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<tbody>
<tr>
<td>- List some of the ecological and economical values of forest resources</td>
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<tr>
<td>- Describe the different methods of timber harvesting and their costs and benefits.</td>
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<td>- Explain how deforestation may help nations develop, but can be ecologically destructive in the long run.</td>
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<td>- Discuss the National Forest Management Act and its goals toward the multiple use of forest land.</td>
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<td>- Identify where most logging in the US takes place and describe the pros and cons of this harvesting method</td>
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<td>- Explain how controlled burns and salvage logging help to protect large stands of timber from wildfire.</td>
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<td>- Explain how consumer demand helps to encourage sustainable forestry practices.</td>
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<th>Essential Questions:</th>
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<tr>
<td>How can we harvest our resources sustainably?</td>
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<tr>
<th>Resources/Links:</th>
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<tr>
<td><strong>text resource disc</strong></td>
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<tr>
<td>Classroom activities:</td>
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<tr>
<td><strong>Your Natural Forests</strong></td>
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<tr>
<td><strong>Awesome Resources</strong></td>
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<tr>
<td>Labs: <a href="http://moodle.lake.k12.fl.us/">http://moodle.lake.k12.fl.us/</a></td>
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<tr>
<td><strong>Making Recycled Paper</strong></td>
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<tr>
<td><strong>How Much Lumber?</strong></td>
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<tr>
<td>Reforesting Africa p. 344-345</td>
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</table>
# 2014-2015 Instructional Curriculum Plan

**Course:** Environmental Science  
**Grade:** 11-12  
**Topic/Idea:** Unit 9 B Resource Management – Soil & Agriculture

### Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

### Annually Assessed Benchmark(s):

### Essential Content & Understanding:
- Describe the formation of soil from bedrock through weathering and erosion to the final product.
- Explain how the characteristics of soil indicate its ability to support plant life.
- Identify ways in which pesticide, fertilizer and irrigation can cause soil pollution.
- Trace the development of agriculture from its beginnings to the green revolution.
- Explain why sustainable alternatives good for both the planet and its people.
- Discuss the need for the world to grow more food and how biotechnology might hold the answers.

### Learning Goal:
Students will understand that our planet's survival depends on our developing practices that enable us to use resources sustainably.

### Objectives:
- Students will be able to:
  - Explain how soil forms, the horizons that make up a soil profile, and the characteristics used to classify soil.
  - Describe practices that can lead to soil erosion, desertification and pesticide pollution and their resulting impacts economically and environmentally.
  - Describe the development of agriculture from its beginnings to the green revolution.
  - Understand the increasing need to increase food production in a sustainable way.
  - Explain how biotechnology may be the key to future food production, but it is not without risk.

### Supporting Standards with Access Points:
**SC.912.L.16.10#**: Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.  
**SC.912.L.17.12#**: Discuss the political, social, and environmental consequences of sustainable use of land.  
**SC.912.L.17.15#**: Discuss the effects of technology on environmental quality.  
**SC.912.L.17.19#**: Describe how different natural resources are produced and how their rates of use and renewal limit availability.

### Essential Questions:
- How can we harvest our resources sustainably?

### Resources/Links:
- **Classroom activities:**
  - **Local Planting Conditions**  
  - **Awesome Resources**  
  - **Testing Soil Properties**  
  - **Combating Erosion**
- **Labs:** [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
- **Reading and Writing in Science:**
  - Dark Earth in the Amazon p. 384-385

### Key Vocabulary:
- Aquaculture  
- Bedrock  
- Contour farming  
- Crop rotation  
- Desertification  
- Genetic engineering  
- Genetically modified organism (GMO)  
- Irrigation  
- Organic agriculture  
- Pesticide  
- Salinization  
- Soil  
- Soil Degradation  
- Soil Horizon  
- Soil Profile  
- Terracing  
- Tilling  
- Weathering

### Date Range:
Given during the instruction per the outline in this section.

### EduSoft Mini-Assessment(s):
### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

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<td>Mineral</td>
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<tr>
<td>Open pit mining</td>
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<td>Ore</td>
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<td>Placer mining</td>
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<td>Rock</td>
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<td>Rock cycle</td>
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<td>Smelting</td>
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<td>Stip mining</td>
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<td>Subsurface mining</td>
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<tr>
<td>Tailings</td>
</tr>
</tbody>
</table>

### Learning Goal:

Students will understand that our planet’s survival depends on our developing practices that enable us to use resources sustainably.

### Objectives:

Students will be able to:

- Identify Earth’s major geological processes and hazards.
- Describe the formation and recycling of rocks and minerals.
- Identify Earth’s mineral resources and describe the environmental effects of using them.
- Identify methods of using minerals more sustainably.

### Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description)**

<table>
<thead>
<tr>
<th>Linked Standards with Access Points:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC.912.L.16.10#: Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.</td>
</tr>
<tr>
<td>SC.912.L.17.12#: Discuss the political, social, and environmental consequences of sustainable use of land.</td>
</tr>
<tr>
<td>SC.912.L.17.15#: Discuss the effects of technology on environmental quality.</td>
</tr>
<tr>
<td>SC.912.L.17.19#: Describe how different natural resources are produced and how their rates of use and renewal limit availability.</td>
</tr>
</tbody>
</table>

### Essential Content & Understanding:

- Understand the Earth is a dynamic planet and the study of Geology attempts to explain the processes that occur on its surface and in its interior.
- Support the theory of plate tectonics with evidence of plate boundaries and the landforms their collisions create.
- Describe the rock cycle and the formation of the three main types of rocks. (volcanoes)
- Differentiate between rocks and minerals and explain how minerals form.
- List several substances that are mined in Florida and describe the methods used.
- Explain the different methods used to process ores and the negative impacts of mining to the environment and society.
- Describe the process of reclamation and how mining regulations impact the sustainable use of the land.
- Suggest ways to use minerals responsibly and what regulations are in place.

### Essential Questions:

How can we harvest our resources sustainably?

### Resources/Links:

** titles on text resource disc

Classroom activities:

- **Local Geology

  [Awesome Resources](http://moodle.lake.k12.fl.us/)

  **Mineral Identification

Reading and Writing in Science:

- Is it Safe to Mine? p. 412-413
- Mining for Cell Phones? p. 391
2014-2015 Instructional Curriculum Plan  
Course: Environmental Science  
Grade: 11-12  
Topic/Idea: Unit 9 D Resource Management – Water

**Instructional Focus Benchmarks**  
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

**Annually Assessed Benchmark(s):**
- SC.912.L.17.20#: Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability

**EduSoft Mini-Assessment(s):**

**Date Range:** Given during the instruction per the outline in this section

**Key Vocabulary:**
- Algal bloom
- Aquifer
- Dam
- Cultural eutrophication
- Fresh water
- Groundwater
- Impermeable
- Non point source pollution
- Point source pollution
- Permeable
- Recharge zone
- Reservoir
- Runoff
- Surface water
- Watershed
- Water table
- Xeriscaping

**Learning Goal:** Students will understand that our planet's survival depends on our developing practices that enable us to use resources sustainably.

**Objectives:** Students will be able to:
- Explain how and why fresh water can be both a renewable yet limited resource.
- Compare and contrast surface water and groundwater.
- Describe the structure of a watershed and suggest methods to manage it.
- Indicate the accessibility of ground water and surface water and discuss the consequences of overuse.
- Outline solutions to freshwater depletion for agricultural, industrial and individual use.
- List and explain the two terms used to describe sources of water pollution.
- List 3 types of water pollution and describe their effects on the environment.
- Describe how salt water intrusion and ground water pollution are serious threats to Florida's aquifer.

**Linked Standards with Access Points:**
- Supporting LAFS and MAFS (as required by course description)
- SC.912.L.17.11#: Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.
- SC.912.L.17.13#: Discuss the need for adequate monitoring of environmental parameters when making policy decisions.
- SC.912.L.17.14#: Assess the need for adequate waste management strategies.
- SC.912.L.17.15#: Discuss the effects of technology on environmental quality.
- SC.912.L.17.19#: Describe how different natural resources are produced and how their rates of use and renewal limit availability.

**Essential Content & Understanding:**
- List and describe the three major categories of fresh water use. (agriculture, industrial & personal)
- Calculate the amount of water you use each day and list steps you could take to conserve.
- List several practices that are depleting our surface and ground water. Use specific examples in Florida.
- Discuss the pros and cons of damming a river. Be sure to consider both economic and environmental issues.
- Describe issues related to surface water depletion in areas around the world.
- Explain what most of the ground water in the US is used for and the effects when areas are withdrawing more than can be replenished.
- Differentiate between point source pollution and non point source pollution and give examples of each.
- Using Lake Apopka and other local lakes as examples, explain the process of cultural eutrophication.
- Explain why groundwater pollution is difficult to discover and to clean up.
- Describe the types of pollution that affect our oceans and their surrounding ecosystems.
- Describe the provisions of the Clean Water Act.

**Essential Questions:**
- How can we harvest our resources sustainably?

**Resources/Links:** ** text resource disc

**Classroom activities:**
- **The Water You Drink**
- **Awesome Resources**
- **Testing Water Quality**
- **Watershed Boundaries**
- **Acid Rain and Seeds**

**Reading and Writing in Science:**
- Looking for Water in the Desert   p. 419
2014-2015 Instructional Curriculum Plan
Course: Environmental Science
Topic/Idea: Unit 9 D Resource Management – Water

- Diagram and describe the processes of drinking and waste water treatment
### Instructional Focus Benchmarks

The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

**Annually Assessed Benchmark(s):**

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<td>SC.912.L.17.20#</td>
<td>Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.</td>
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</table>

**Edusoft Mini-Assessment(s):**

- [ ]

**Date Range:** Given during the instruction per the outline in this section

### Key Vocabulary:

- Air pollution
- Air pressure
- Air mass
- Atmosphere
- Conduction
- Convection
- Emissions
- Front
- Greenhouse effect
- Primary Pollution
- Ozone layer
- Radiation
- Relative humidity
- Secondary pollution

### Learning Goal:

Students will understand that our planet’s survival depends on our developing practices that enable us to use resources sustainably.

### Objectives:

- Students will be able to:
  - List and describe the main properties of the atmosphere and explain how each relates to the other systems and cycles on the Earth.
  - Describe the layers of the atmosphere and their influences on the biosphere and weather.
  - Explain the importance of the ozone layer as it relates to Earth’s ability to sustain life.
  - List 2 examples of air pollution formed by natural processes and 2 examples caused by human activities.
  - Identify the main components of the Clean Air Act and explain how its provisions have set standards for air quality.

### Essential Content & Understanding

- Identify the 4 properties of the atmosphere and explain the function of each component.
- Relate the presence of nitrogen, oxygen and water vapor to the biogeochemical cycles of life.
- Explain the concept of relative humidity and the difference in temperature between a humid hot day and a dry hot day in Florida.
- Describe the factors affecting air temperature and pressure. Relate these to the formation of weather patterns.
- Diagram the Earth’s atmosphere and label the layers and identify their key characteristics.
- Locate the ozone layer and describe the beneficial service it provides.
- Compare and contrast the different forms of heat transfer and how they influence weather patterns and climate.
- Explain or diagram how the air masses in the troposphere affect our weather.
- Differentiate between primary and secondary air pollution and give examples of each.
- Describe the effect of smog and temperature inversions and how they can actually worsen air pollution.
- Explain how acid rain is formed and the damage it can do to ecosystems and man-made structures.

### Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description)**

- SC.912.L.17.11#: Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.
- SC.912.L.17.13#: Discuss the need for adequate monitoring of environmental parameters when making policy decisions.
- SC.912.L.17.14#: Assess the need for adequate waste management strategies.
- SC.912.L.17.15#: Describe the effects of technology on environmental quality.

### Essential Questions:

- How can we harvest our resources sustainably?

### Resources/Links:

- **Text resource:**
  - Classroom activities:
    - Atmosphere foldable
    - Awesome Resources
  - Labs:
    - http://moodle.lake.k12.fl.us/
    - Quick Lab: How does Hot Water Move? P. 459
    - **Using Your UV Index**
    - **What’s in the Air?**
    - **Acid Rain and Seeds**
  - Reading and Writing in Science:
    - Find Out More p. 456
    - Clean Air Act p. 474-475
Topic/Idea: Unit 9 E Resource Management – Atmosphere

- Describe how pollution affects our ozone layer and how this might be a cause of global warming.
### Instructional Focus Benchmarks
The below benchmark(s) is linked to the CPALMS site that contains the Specifications to include the Content limits, Attributes/Stimulus, and additional information.

### Learning Goal:
Students will understand that our planet's survival depends on our developing practices that enable us to use resources sustainably.

### Objectives:
- Describe our need for a constant supply of energy for industry, commerce, transportation and personal use.
- Explain the formation of fossil fuels and identify the three forms we use as fuel.
- Evaluate the consequences of using fossil fuels and suggest conservation methods.
- Describe how a nuclear power is harnessed to generate electricity and the pros and cons of its use.

### Annually Assessed Benchmark(s):

### EduSoft Mini-Assessment(s):

### Date Range:
Given during the instruction per the outline in this section.

### Key Vocabulary:
- Energy
- Fossil fuel
- Meltdown
- Nonrenewable energy
- Nuclear energy
- Nuclear fission
- Nuclear waste
- Oil sand
- Oil shale
- Petroleum
- Renewable energy
- Strip mining

### Linked Standards with Access Points:
- **Supporting LAFS and MAFS (as required by course description):**
  - SC.912.P.10.1#: Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.
  - SC.912.P.10.2#: Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.
  - SC.912.L.17.11#: Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.
  - SC.912.L.17.19#: Describe how different natural resources are produced and how their rates of use and renewal limit availability.

### Essential Content & Understanding:
- Describe the formation of fossil fuels.
- Explain the uses of coal and how it is removed from the ground.
- Identify products made from petroleum and other ways that it can be used in addition to a source of energy.
- Describe the methods used to extract petroleum from the ground.
- Explain the use of natural gas over burning other fossil fuels.
- Predict the future of fossil fuels.
- Identify the hazards of using fossil fuels.
- Relate nuclear fission to energy production and describe how a nuclear power plant works.
- Identify the benefits and the costs and hazards of using nuclear power.
- Compare the costs, benefits, and hazards of using a nonrenewable energy source.

### Essential Questions:
- Why can’t we depend on nonrenewable energy resources to meet our energy needs?

### Resources/Links:
- **text resource disc**
  - **Classroom activities:**
    - **Home Energy Use**
    - **Awesome Resources**
  - **Labs:** [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)
    - **Fossil Fuel Use**
  - **Reading and Writing in Science:**
    - Using Coal to Generate Electricity p. 542-543
    - Oil or Wilderness on Alaska’s North Slope p. 515
### 2014-2015 Instructional Curriculum Plan

**Course:** Environmental Science  
**Grade:** 11-12  
**Topic/Idea:** Unit 10 A Our Future Planet – Climate Change

<table>
<thead>
<tr>
<th>Instructional Focus Benchmarks</th>
<th>Learning Goal: Students will understand that our choices today will define the future sustainability of our planet.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annually Assessed Benchmark(s):</strong></td>
<td>Identify the evidence of global climate change</td>
</tr>
<tr>
<td><strong>EduSoft Mini-Assessment(s):</strong></td>
<td>• Understand the increase of greenhouse gases is believed to be the cause of global warming</td>
</tr>
<tr>
<td><strong>Date Range:</strong></td>
<td>• Predict the effects of climate change on ecosystems and communities.</td>
</tr>
<tr>
<td><strong>Key Vocabulary:</strong></td>
<td>• List 3 ways to reduce the production of greenhouse gases.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Linked Standards with Access Points:</th>
<th>Essential Content &amp; Understanding:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supporting LAFS and MAFS (as required by course description)</strong></td>
<td>• Identify and explain the evidence of global warming; rise in temperature, precipitation trends, melting of polar ice and rising sea levels.</td>
</tr>
<tr>
<td>SC.912.N.3.5#: Describe the functions of models in science, and identify the wide range of models used in science.</td>
<td>• Be able to explain what ozone is, how it is formed and why it is important to the planet.</td>
</tr>
<tr>
<td>SC.912.N.4.2#: Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic and environmental.</td>
<td>• Describe several methods used to study climate change.</td>
</tr>
<tr>
<td>SC.912.E.7.7#: Identify, analyze, and relate the internal (Earth system) and external (astrophysical) conditions that contribute to global climate change.</td>
<td>• Understand how models and past and present data can help predict future events.</td>
</tr>
<tr>
<td>SC.912.L.17.4#: Describe changes in ecosystems resulting from seasonal variations, climate change and succession.</td>
<td>• Explain the cause of climate change and support your statement with example data.</td>
</tr>
<tr>
<td>SC.912.L.17.8#: Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.</td>
<td>• Predict future impacts of global warming on ecosystems and organisms.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Essential Questions:</th>
<th>Resources/Links: ** text resource disc</th>
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</thead>
<tbody>
<tr>
<td>Should we worry about the ozone layer?</td>
<td>Classroom activities:</td>
</tr>
</tbody>
</table>

**Real Data:** Changing Temperature of the Atmosphere p. 493  
**Awesome Resources**  
**Labs:** [http://moodle.lake.k12.fl.us/](http://moodle.lake.k12.fl.us/)  
**Reading and Writing in Science:**  
Rising Sea May Flood the Maldive Islands p. 483  
Make a Difference p. 504  
Climate Clues in Ice p. 508-509
### 2014-2015 Instructional Curriculum Plan

**Grade:** 11-12  
**Course:** Environmental Science  
**Topic/Idea:** Unit 10 B Our Future Planet – Sustainable Cities

<table>
<thead>
<tr>
<th>Instructional Focus Benchmarks</th>
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<table>
<thead>
<tr>
<th>Key Vocabulary:</th>
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<tbody>
<tr>
<td>City planning</td>
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<td>Ecological restoration</td>
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<tr>
<td>GIS</td>
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<td>Green building</td>
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<td>Greenway</td>
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<td>Mass Transit</td>
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<td>Smart growth</td>
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<td>Urban growth boundaries</td>
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<td>Zoning</td>
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<tr>
<th>Objectives: Students will be able to:</th>
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<tbody>
<tr>
<td>- Identify the characteristics of a sustainable city.</td>
</tr>
<tr>
<td>- Describe the tools used by city planners to make cities more livable</td>
</tr>
<tr>
<td>- Understand the principles of smart growth and the new urbanism</td>
</tr>
<tr>
<td>- Identify the key components of a green building design.</td>
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<tr>
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<tbody>
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<table>
<thead>
<tr>
<th>Essential Content &amp; Understanding:</th>
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<tbody>
<tr>
<td>- Describe the four components of city planning and the tools used by a Developer or city planner.</td>
</tr>
<tr>
<td>- List the advantages of using zoning and urban growth boundaries when planning development areas.</td>
</tr>
<tr>
<td>- Describe how the philosophy of smart growth and new urbanism can begin to reverse the effects of urban sprawl by redevelopment.</td>
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<tr>
<td>- Discuss transportation options and stress the need for a mass transit system instead of individual vehicles.</td>
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<tr>
<td>- List two examples of why open space or greenways are important to city dwellers.</td>
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<tr>
<td>- Describe the goal of green building design and list several examples of how it can be utilized.</td>
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<td>- Explain how cities making progress toward sustainability may be the key element toward global sustainability.</td>
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<tr>
<th>Essential Questions:</th>
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<tr>
<td>What are the characteristics of a sustainable city?</td>
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<thead>
<tr>
<th>Resources/Links:</th>
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<tbody>
<tr>
<td><strong>text resource disc</strong></td>
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<table>
<thead>
<tr>
<th>Classroom activities:</th>
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<tbody>
<tr>
<td>Project: Charrette for Sustainability  p. 320</td>
</tr>
<tr>
<td>Awesome Resources</td>
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<thead>
<tr>
<th>Labs:</th>
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<tbody>
<tr>
<td>Go Outside: Open Space  p. 310</td>
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<table>
<thead>
<tr>
<th>Reading and Writing in Science:</th>
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<tbody>
<tr>
<td>What Do You Think?  p. 306</td>
</tr>
<tr>
<td>Instructional Focus Benchmarks</td>
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<td>Key Vocabulary:</td>
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<tr>
<td>E-waste</td>
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<td>Hazardous waste</td>
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<td>Incineration</td>
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<td>Industrial waste</td>
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<td>Leachate</td>
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<td>Municipal solid waste</td>
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<td>Radioactive waste</td>
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<td>Recycle</td>
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<td>Sanitary landfill</td>
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<td>Superfund waste</td>
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<tr>
<td>Reading and Writing in Science: Recycling p. 604-605</td>
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### Instructional Focus Benchmarks

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<td>Biomass energy</td>
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<td>Flat plate solar collector</td>
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<td>Fuel cell</td>
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<td>Geothermal energy</td>
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<td>Ground source heat pump</td>
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<td>Hydrogen fuel</td>
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<td>Hydropower</td>
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<td>OTEC</td>
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<td>Passive solar energy</td>
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<td>Photovoltaic cell</td>
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<tr>
<td>Tidal energy</td>
</tr>
<tr>
<td>Wind turbine</td>
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<td>Wind farm</td>
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### Learning Goal:

Students will understand that our choices today will define the future sustainability of our planet.

#### Objectives:

- Recognize the need for alternative energy sources in our future.
- Identify five alternative sources of energy and describe their most common use.
- Describe the positives and the negatives of each alternative energy source and choose the right one for the job at hand.

### Linked Standards with Access Points:

**Supporting LAFS and MAFS (as required by course description)**

<table>
<thead>
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<tr>
<td>SC.912.E.4.6#: Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.</td>
</tr>
<tr>
<td>SC.912.L.17.11#: Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and environmental systems and examine how human lifestyles affect sustainability forests.</td>
</tr>
<tr>
<td>SC.912.L.17.18#: Describe how human population size and resource use relate to environmental quality.</td>
</tr>
</tbody>
</table>

### Essential Content & Understanding:

- Explain the need and the benefits for using alternative energy sources.
- Identify types of biomass energy and explain how they are used.
- Describe how geothermal energy could be harnessed and used.
- Identify the different types of hydropower and the benefits and costs of each.
- Compare and contrast passive and active solar heating.
- List the benefits and costs of using solar energy and explain how a photovoltaic cell works.
- List the benefits and costs of wind power and explain how to generate electricity.
- Diagram and explain the use of a hydrogen fuel cell.
- Identify the most efficient fuel for the homes of the year 2050.

### Essential Questions:

- Which renewable resource is the fuel of the future?

### Resources/Links:

**text resource disc**

**Classroom activities:**

- **Regional Renewable Resource**
  - National Renewable Energy Site
  - Renewable Energy Resources
  - Awesome Resources

**Labs:**

- http://moodle.lake.k12.fl.us/
- **Compare Biofuels**
- **Energy from the Wind**

**Reading and Writing in Science:**

- Germany’s Big Bet On Renewable Energy  p. 549
- Are Biofuels better for the environment?  p. 574
<table>
<thead>
<tr>
<th>Standard</th>
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</tr>
</thead>
<tbody>
<tr>
<td>MAFS.912.F.IF.2.4</td>
<td>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. <em>Key features include:</em> intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.</td>
</tr>
<tr>
<td>MAFS.912.S.ID.1.1</td>
<td>Represent data with plots on the real number line (dot plots, histograms, and box plots).</td>
</tr>
<tr>
<td>MAFS.912.S.ID.1.2</td>
<td>Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</td>
</tr>
<tr>
<td>MAFS.912.S.ID.1.3</td>
<td>Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</td>
</tr>
<tr>
<td>MAFS.912.S.ID.2.5</td>
<td>Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.</td>
</tr>
<tr>
<td>LAFS.1112.SL.1.1</td>
<td>Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.</td>
</tr>
<tr>
<td>a.</td>
<td>Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</td>
</tr>
<tr>
<td>b.</td>
<td>Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</td>
</tr>
<tr>
<td>c.</td>
<td>Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</td>
</tr>
<tr>
<td>d.</td>
<td>Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</td>
</tr>
<tr>
<td>LAFS.1112.SL.1.2</td>
<td>Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.</td>
</tr>
<tr>
<td>LAFS.1112.SL.1.3</td>
<td>Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</td>
</tr>
<tr>
<td>LAFS.1112.SL.2.4</td>
<td>Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</td>
</tr>
<tr>
<td>Standard</td>
<td>Description</td>
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<tr>
<td>LAFS.1112.SL.2.5:</td>
<td>Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</td>
</tr>
<tr>
<td>LAFS.1112.RST.1.1:</td>
<td>Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</td>
</tr>
<tr>
<td>LAFS.1112.RST.1.2:</td>
<td>Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</td>
</tr>
<tr>
<td>LAFS.1112.RST.1.3:</td>
<td>Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</td>
</tr>
<tr>
<td>LAFS.1112.RST.1.4:</td>
<td>Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</td>
</tr>
<tr>
<td>LAFS.1112.RST.1.5:</td>
<td>Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</td>
</tr>
<tr>
<td>LAFS.1112.RST.1.6:</td>
<td>Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</td>
</tr>
<tr>
<td>LAFS.1112.RST.3.7:</td>
<td>Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</td>
</tr>
<tr>
<td>LAFS.1112.RST.3.8:</td>
<td>Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</td>
</tr>
<tr>
<td>LAFS.1112.RST.3.9:</td>
<td>Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</td>
</tr>
<tr>
<td>LAFS.1112.RST.4.10:</td>
<td>By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.</td>
</tr>
<tr>
<td>LAFS.1112.WHST.1.1:</td>
<td>Write arguments focused on discipline-specific content.</td>
</tr>
<tr>
<td>a.</td>
<td>Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.</td>
</tr>
</tbody>
</table>
## Supporting Florida ELA and Math Standards

<table>
<thead>
<tr>
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<tr>
<td><strong>b.</strong></td>
<td>Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases.</td>
</tr>
<tr>
<td><strong>c.</strong></td>
<td>Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</td>
</tr>
<tr>
<td><strong>d.</strong></td>
<td>Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</td>
</tr>
<tr>
<td><strong>e.</strong></td>
<td>Provide a concluding statement or section that follows from or supports the argument presented.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LAFS.1112.WHST.1.2:</th>
<th>Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a.</strong></td>
<td>Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</td>
</tr>
<tr>
<td><strong>b.</strong></td>
<td>Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.</td>
</tr>
<tr>
<td><strong>c.</strong></td>
<td>Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts.</td>
</tr>
<tr>
<td><strong>d.</strong></td>
<td>Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.</td>
</tr>
<tr>
<td><strong>e.</strong></td>
<td>Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LAFS.1112.WHST.2.4:</th>
<th>Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LAFS.1112.WHST.2.5:</strong></td>
<td>Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.</td>
</tr>
<tr>
<td><strong>LAFS.1112.WHST.2.6:</strong></td>
<td>Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</td>
</tr>
<tr>
<td><strong>LAFS.1112.WHST.2.7:</strong></td>
<td>Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td>
</tr>
<tr>
<td><strong>LAFS.1112.WHST.3.8:</strong></td>
<td>Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</td>
</tr>
</tbody>
</table>
### Supporting Florida ELA and Math Standards

<table>
<thead>
<tr>
<th>LAFS.1112.WHST.3.9:</th>
<th>Draw evidence from informational texts to support analysis, reflection, and research.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAFS.1112.WHST.4.10:</td>
<td>Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</td>
</tr>
</tbody>
</table>