

Environmental Science Year-at-a-Glance
ARKANSAS STATE SCIENCE STANDARDS

FIRST SEMESTER				SECOND SEMESTER			
<u>Unit 1</u> Geosphere	<u>Unit 2</u> Atmosphere	<u>Unit 3</u> Hydrosphere	<u>Unit 4</u> Biosphere	<u>Unit 5</u> Populations	<u>Unit 6</u> Land	<u>Unit 7</u> Energy	<u>Unit 8</u> Waste and Citizenship
5 weeks	4 weeks	4 weeks	4 weeks	5 weeks	4 weeks	4 weeks	7 weeks
EVS-ESS2-3	EVS-ESS2-2 EVS-ESS3-5 EVS-PS3-2 EVS-ESS2-4 EVS-ESS3-6	EVS-ESS2-5 EVS-ETS1-1 EVS-PS3-1	EVS-ESS2-6 EVS-LS2-8	EVS-LS2-1 EVS-LS2-2 EVS-LS2-6 EVS-LS4-6 EVS-ETS1-3	EVS-ESS3-3 EVS-ESS3-4 EVS-LS2-7	EVS-PS3-3 EVS-PS3-4 EVS2-ETS1-2 EVS-ESS3-1	EVS-ETS1-3 EVS-ESS3-2

Recurring

RST.11-12.2 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.

RST.11-12.3 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.

RST.11-12.4 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.

RST.11-12.9 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.

WHST.11-12.1 Write arguments focused on discipline-specific content

[Unit 1](#)

[Unit 2](#)

[Unit 3](#)

[Unit 4](#)

[Unit 5](#)

[Unit 6](#)

[Unit 7](#)

[Unit 8](#)

Unit 1	The Geosphere	Grade Level	11	Approx length	5 weeks
Arkansas State Standards					
<ul style="list-style-type: none">• EVS-ESS2-3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.					

Unit 2	The Atmosphere	Grade Level	11-12	Approx Length	4 weeks
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CPSD Power Standards with Student Learning Objectives

EVS-ESS3-5 Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

- Student-Friendly Objectives:**
- I can use evidence to analyze a climate model.
 - I can use a climate model to describe part of an Earth system.
 - I can describe human activities that have contributed to climate change.
 - I can predict possible impacts to Earth due to climate change.

Learning Indicators of Power Standards

<p>Students will know...</p> <ul style="list-style-type: none"> ● The difference between climate and weather ● Earth systems will be impacted by climate change 	<p>And be able to...</p> <ul style="list-style-type: none"> ● Analyze a weather report. ● Compare and contrast daily weather and climate models. ● Predict future local and global impacts due to climate change. ● Use evidence to explain examples of human activities that have contributed to climate change. ● Compare and contrast natural hazards and human caused events.
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Additional Arkansas State Standards

- **EVS-ESS2-2** Analyze geoscience data to make the claim that one change to Earth’s surface can create feedbacks that cause changes to other Earth systems.
- **EVS-ESS2-4** Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate.
- **EVS-ESS3-6** Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
- **EVS-PS3-2** Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative positions of particles (objects).

Unit 3	The Hydrosphere	Grade Level	11-12	Approx Length	4 weeks
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Arkansas State Standards

- **EVS-ESS2-5** Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
- **EVS-PS3-1** Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.
- **EVS-ETS1-1** Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

Unit 4	The Biosphere	Grade Level	11-12	Approx Length	4 weeks
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CPSD Power Standards with Student Learning Objectives

EVS-ESS2-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

Student-Friendly Objectives:

- I can describe how carbon is cycled in the biosphere.
- I can predict long-term effects of volcanic ash on the carbon cycle.
- I can analyze a model of the carbon cycles.
- I can create and describe a quantitative model of the carbon cycle.
- I can explain how humans affect the carbon cycle.
- I can calculate my carbon footprint.
- I can describe how carbon enters and leaves the atmosphere.
- I can identify how the geosphere, atmosphere, hydrosphere, and biosphere play a role in the cycling of carbon.
- I can demonstrate how industry and transportation contribute to the carbon cycle.
- I can determine how fossil fuels are created and how they are used by humans.
- I can determine how carbon levels affect the greenhouse gasses.
- I can create an explanation for climate change based on carbon dioxide levels and runaway greenhouse gas effect.

Learning Indicators of Power Standards

<p>Students will know...</p> <ul style="list-style-type: none"> ● How energy is cycled within and amongst each sphere: hydrosphere, atmosphere, geosphere, and biosphere ● Earth is a closed system, but its spheres are interacting systems. ● Types of energy sources in Arkansas ● Deforestation causes an increase in carbon dioxide in the atmosphere ● Organic matter is made mostly of carbon ● Decomposition returns carbon to the geosphere 	<p>And be able to...</p> <ul style="list-style-type: none"> ● Create a quantitative model of the cycling of carbon. ● Explain how humans affect the carbon cycle. ● Describe a carbon sink and its importance to the environment. ● Calculate their carbon “footprint.” ● Evaluate Arkansas’ energy production and usage.
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Additional Arkansas State Standards

- **EVS-LS2-8** Evaluate evidence for the role of group behavior on individual and species’ chances to survive and reproduce.

Unit 5	Populations	Grade Level	11-12	Approx Length	5 weeks
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CPSD Power Standards with Student Learning Objectives

EVS-LS2-6 Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

Student-Friendly Objectives:

- I can describe the levels of organization of within/of an ecosystem.
- I can model the flow of energy through an ecosystem.
- I can analyze relationships between organisms in an ecosystem.
- I can describe the difference between ecosystems and biomes.
- I can predict outcomes ecosystem instability.
- I can compare changes in population data.
- I can explain how new ecosystems are created.

Learning Indicators of Power Standards

<p>Students will know...</p> <ul style="list-style-type: none"> ● Characteristics/components of an ecosystem ● Factors that make an ecosystem stable/unstable ● The difference between biomes and ecosystems ● Extreme changes in conditions or the size of any population can challenge the functioning of ecosystems in terms of resources and habitat availability ● A keystone species is a species on which an ecosystem depends 	<p>And be able to...</p> <ul style="list-style-type: none"> ● Model energy flow through an ecosystem. ● Use evidence to identify ecosystem changes. ● Describe the role of ecological succession in creating new ecosystems. ● Compare changes in population data from different years. ● Evaluate claims, evidence, and reasoning about ecosystems and habitat loss from different sources.
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Additional Arkansas State Standards

- **EVS-LS2-1** Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
- **EVS-LS2-2** Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
- **EVS-LS4-6** Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
- **EVS-ETS1-3** Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints,

including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

Unit 6	Land	Grade Level	11-12	Approx Length	4 weeks
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Arkansas State Standards

- **EVS-ESS3-3** Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.
- **EVS-ESS3-4** Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
- **EVS-LS2-7** Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Unit 7	Energy	Grade Level	11-12	Approx Length	4 weeks
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Arkansas State Standards

- **EVS-PS3-3** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
- **EVS-PS3-4** Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
- **EVS-ETS1-2** Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
- **EVS-ESS3-1** Construct an explanation based on evidence for how the availability of natural resources, occurrences of natural hazards, and changes in climate have influenced human activity.

Unit 8	Waste and Citizenship	Grade Level	11-12	Approx Length	7 weeks
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CPSD Power Standards with Student Learning Objectives

EVS-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

Student-Friendly Objectives:

- I can compare and contrast cost benefits of environmental practices.
- I can explain how water is used and managed.
- I can describe various methods of how minerals are extracted.
- I can use evidence to determine the most sustainable products for human use.
- I can develop a plan to reduce personal environmental impact.

Learning Indicators of Power Standards

<p>Students will know...</p> <ul style="list-style-type: none"> ● Resource availability has guided the development of human society ● Types of land management strategies and techniques ● The differences between conservation, sustainability, and economic efficiency 	<p>And be able to...</p> <ul style="list-style-type: none"> ● Compare and contrast the cost benefits of different environmental practices. ● Describe how mineral resources are extracted. ● Explain how water is used and managed within a community. ● Determine the most sustainable products for daily human consumption and use. ● Develop a plan to reduce personal environmental impact.
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Additional Arkansas State Standards

- **EVS-ETS1-3** Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.