EXPLORE ONE STEP CLIMATE SCIENCE LESSON PLANS

Take a look at how all One Step lessons, projects, and experiments employ all 5Es and help teachers address NGSS performance expectations.

One Step lessons include student-led experiments, projects, and research tailored for grades 4–12. Within each lesson, students may be asked to design an experiment testing a claim, analyze data, and then debate the implications with their peers. To further deepen their learning, they may also be asked to create a model to understand a scientific phenomena, research a scientific premise, make a presentation about the environmental impacts of an industry, or engineer a device to solve a problem in their community—among many other instructional prompts!

One Step lessons include **embedded teacher supports**, such as **"To Prepare"** notes that include a list of materials and steps for teachers to complete before beginning the lesson. **Instructional notes** are also embedded throughout each lesson plan and include potential student responses, misconceptions, and guidance.

One Step Focus Skills Embedded Within NGSS Performance Expectations

- Asking Questions & Defining Problems
- Developing & Using Models
- Planning & Carrying Out Investigations
- Analyzing & Interpreting Data
- Using Mathematics & Computational Thinking
- Constructing Explanations & Designing Solutions
- Engaging in Arguments from Evidence
- Obtaining, Evaluating & Communicating Information

ONE STEP LESSON PLANS FOLLOW THE 5E INSTRUCTIONAL FLOW

Engage

One Step lessons assess students' prior knowledge and engage their curiosity about a topic through short learning activities. These learning activities focus on an event, phenomenon, object, or situation. They will also help organize student thinking towards the desired learning outcomes and can often uncover student misconceptions that should be addressed in later parts of the lesson. By the end of this section, students' interests should be piqued, and they should be actively invested in producing a thoughtful response that answers the questions posed by the event, phenomenon, object, or situation.

WHAT'S THE WEATHER GOT TO DO WITH IT,
Grades 6–8

Grades 6–8

NEXT GENERATION SCIENCE STANDARDS

MS-ESS2-5: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations Developing and Using Models	ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate	Cause and Effect

Example: *Students observe a plastic bottle that has a large water balloon inside and discuss this "science mystery" in small groups: "How do you think it's possible to get a water balloon inside the bottle without breaking the balloon? Write or draw an explanation for how you think it happened."*

Explore

One Step lessons provide time for students to investigate, explore, and make meaning of the topic at hand. These activities, including research challenges and experiments, provide common, concrete experiences for students, which will give them a solid foundation of understanding. The teacher plays the role of a facilitator; by the end of this section students should be ready to share observations and patterns with their peers as practice in making meaning and constructing explanations.

OCEANS,
Grades 4–5

NEXT GENERATION SCIENCE STANDARDS

4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

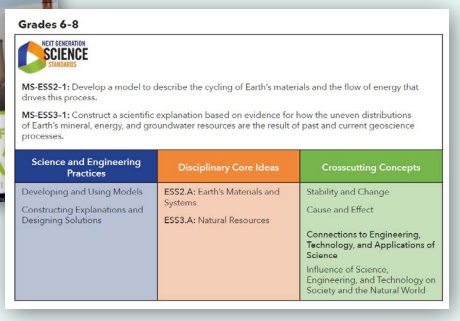
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Obtaining, Evaluating, and Communicating Information	ESS2.A: Earth Materials and Systems ESS3.C: Human Impacts on Earth Systems	Cause and Effect Systems and System Models Influence of Engineering, Technology, and Science on Society and the Natural World Science Addresses Questions About the Natural and Material World

Example: *After students observe how carbon dioxide impacts the pH of water, students are asked to set up an experiment to determine how the altered water impacts organisms that have calcium carbonate shells. Students use vinegar, water, and chicken eggshells in their experiment, record their findings in a provided lab notebook, then infer what the results tell them about marine organisms with shells.*

Explain

One Step lessons build understanding through challenging students to explain their findings and observations. This section provides an opportunity for teachers to directly introduce scientific concepts students may have grappled with in the engagement and exploration activities, and to address any misconceptions. By the end of this section, students should be able to explain how scientific concepts influence these activities.

FOSSIL FUELS, Grades 6–8



Grades 6-8

NEXT GENERATION SCIENCE STANDARDS

MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

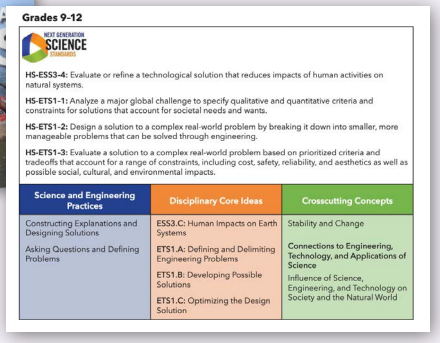
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Constructing Explanations and Designing Solutions	ESS2.A: Earth's Materials and Systems ESS3.A: Natural Resources	Stability and Change Cause and Effect **Connections to Engineering, Technology, and Applications of Science** Influence of Science, Engineering, and Technology on Society and the Natural World

Example: *After watching a One Step video about fossil fuels, students debate the meaning and relevance of the following quote from Van Jones: "If we keep pulling death from the ground, we will reap death from the skies." Students then explore an interactive map of coal fields to understand more about the distribution of fossil fuels.*

Elaborate

One Step lessons challenge students to extend their learning goals by applying what they've learned in a new situation or context. By the end of this section, students will have deepened their understanding of learning goals and can demonstrate the ability to generalize concepts and/or skills.

ECOBOATS: THE SOLUTION THAT FLOATS, Grades 9–12



Grades 9-12

NEXT GENERATION SCIENCE STANDARDS

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-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.

HS-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.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions Asking Questions and Defining Problems	ESS3.C: Human Impacts on Earth Systems ETS1.A: Defining and Delimiting Engineering Problems ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution	Stability and Change **Connections to Engineering, Technology, and Applications of Science** Influence of Science, Engineering, and Technology on Society and the Natural World

Example: *After engineering a product that utilizes plastic waste, students are challenged to create a "pitch" for their product that they might present to future investors, including a demo of their product prototype.*

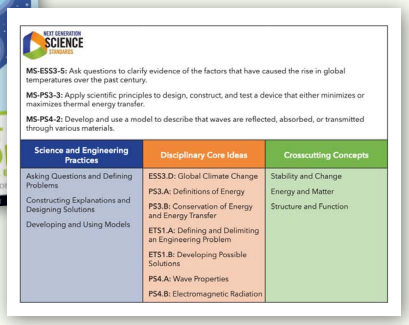
SUPPORT STUDENT-CENTERED LEARNING ACROSS CURRICULA!

Explore One Step

Evaluate

One Step lessons include ways to evaluate students' progress towards their learning goals, and methods to help students reflect on their learning. Learning activities in this section might include a poster presentation, a classroom debate, or a written explanation of a concept or model. One Step provides suggested rubrics to support teachers in evaluating learning.

TOO HOT TO HANDLE: THE GREENHOUSE EFFECT, Grades 6–8



NEXT GENERATION SCIENCE STANDARDS

MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

MS-PS3-3: Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

MS-PS4-2: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking Questions and Defining Problems	ESS3.D: Global Climate Change	Stability and Change
Constructing Explanations and Designing Solutions	PS3.A: Definitions of Energy	Energy and Matter
Developing and Using Models	PS3.B: Conservation of Energy and Energy Transfer	Structure and Function
	ETS1.A: Defining and Delimiting an Engineering Problem	
	ETS1.B: Developing Possible Solutions	
	PS4.A: Wave Properties	
	PS4.B: Electromagnetic Radiation	

Example: *After creating a greenhouse effect model and analyzing data about atmospheric carbon dioxide levels, solar irradiance, and fossil fuel emissions, students write a claim with evidence and reasoning that answers the question "Is the greenhouse effect mostly due to human activities or nature?"*

READY-MADE CLIMATE EDUCATION LESSON PLANS

One Step is a video-based program for grades 4–12 focused on climate science, environmental issues, and sustainability, and is correlated to Next Generation Science Standards (NGSS).

Interested in learning more about how One Step can support your school or district?

Schedule a Demo