

Energize Schools Distance Learning Resource Guide

sei BUILDING LEADERS FOR A
RESILIENT WORLD



**ENERGIZE
SCHOOLS**

A PROGRAM OF SEI

Table of Contents

Introduction to Energize School Distance Learning Resources.....	2
Green Careers Webinar Series.....	3
Teacher-Facing Curriculum.....	4
Introduction to Climate Change.....	5
Introduction to Energy Auditing.....	6
Renewable Energy (Hydropower).....	7
Air Quality.....	8
Watersheds and Public Water Systems.....	9
Student-Facing Curriculum.....	10
Energy Specialist Certificate (Spanish/English).....	11
Air Quality Science 101.....	12
Waste Analysis 101.....	13
Solar Design 101.....	14
Water Conservation Specialist 101.....	15
Transportation Analysis 101.....	16
Energy Consulting 101.....	17
Earthship Design Challenge.....	18

Introduction to Energize Schools Distance Learning Resources

Energize Schools curriculum is freely available to California 9-12th high school teachers. These projects will engage your students in learning about a range of sustainability topics while practicing valuable career skills and are aligned with the Common Core and Next Generation Science Standards.

While curriculum units are packaged together to be taught over the course of multiple days or weeks, each lesson within the curriculum package can be taught as a stand-alone project and integrated into your existing lesson plans.

In an effort to support high schools during shutdowns, we are sharing distance learning resources* to help you continue providing learning opportunities for students. Our team is available and here as a resource to support you.

*Resources are designed for 9th-12th grade students, but can be adapted for 6th-8th grade students.

Key:



Duration of Unit



Highlighted Activity

Button

If viewing this guide as a PDF, click on the linked buttons to be redirected to the Energize Schools website to request resources.



Green Careers Webinar Series

Access a growing library of webinar recordings with green career professionals that range from climate change activists to renewable energy specialists! Each 30 minute webinar features professionals who share their journey of how they got to where they are today and answer questions submitted by students.



Each video is approximately **30 minutes** long and can be viewed synchronously or asynchronously with in-class time. Additional activities that may accompany a webinar can take approximately 0.5 to 2 hours to complete.



The library includes career exploration activities for student including:

- Resume and cover letter writing
- Career skills assessment
- Green careers webinar journal

The library includes webinars from these professionals and more:



Leah Thomas
Activist & Founder
Intersectional
Environmentalist



Jacques Chirazi
Biomimicry Expert
UC San Diego



Angie Polanco
Engineer
California Air
Resources Board



Kevin Lee
Environmental
Impact Specialist
Dr. Bronner's

Request free access to the Green Careers Webinar Library
or visit energizeschools.org/webinarseries



Teacher-Facing Curriculum

Bring hands-on projects to your students using SEI's Distance Learning Units. The Distance Learning Units are teacher-facing resources designed for engaging students in synchronous, virtual instruction.

SEI's teacher-facing distance learning units will fit into many subject's scope and sequence. These units can be implemented independently or as a series. To give your students a breath of understanding about energy and the environment, we recommend teaching SEI's Introduction to Climate Change, Energy Auditing, and Renewable Energy units.

Teacher-Facing Units include:



Introduction to
Climate Change



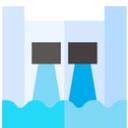
Air Quality



Introduction to
Energy Auditing



Watersheds and Public
Water Systems



Renewable Energy
(Hydropower)

Request access to Teacher-Facing Curriculum Units
or visit energizeschools.org/distancelearning



Introduction to Climate Change

This unit provides students with hands-on learning activities to explore the causes and consequences of climate change. In this unit, students will learn about the fundamental scientific processes of climate change through modeling carbon movement through reservoirs and the greenhouse gas effect. Students who complete the Introduction to Climate Change unit will be equipped with the tools needed to act as climate leaders in their classrooms and schools.



2.5 hours

Including lectures, activities, and assignments

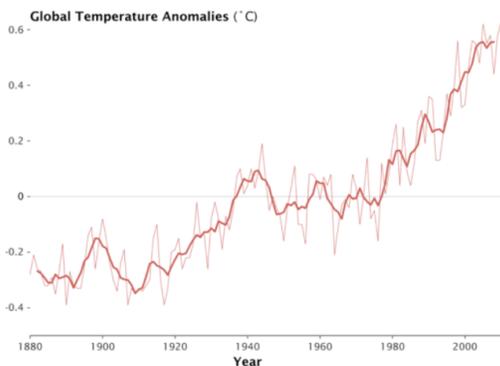


Strength of the Evidence Activity

Featured in Lesson 3: The Science of Climate Change

In this activity, students examine consequences associated with rising global temperatures. Students also develop graph and data interpretation skills.

Breakout Group 3



What do you notice?

I notice that between 1880 to the 1920 the temperature started to grow and then just weirdly staggered until 1940

This graph demonstrates that over the long term, the surface temperature recordings are consistent in showing an uptick in global temperatures around the 1980's

I notice that between 1930 and 1980 there aren't many global temperature anomalies

What do you wonder?

I wonder if these stats were to be taken in a specific region would the results be the same? and if the results are different, what about the area caused the changes?

I wonder what is making the global temperatures go up

Does the data processing make the temperature data warmer?



Introduction to Energy Auditing

In this unit, students learn how to conduct a school or personal energy audit. Students will complete a series of activities, including a plug-load audit and investigation of opportunities for energy conservation and efficiency. Practical applications in math and science to understand the economic and environmental benefits of energy use reduction will also be covered.



2.5 hours

Including lectures, activities, and assignments

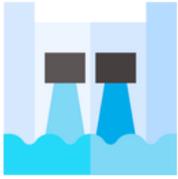


Plug Load Audit and Energy Consumption Calculations

Featured in Lesson 2: Auditing Plug Loads

Using a watt meter, students conduct an audit of appliances and computers in their classroom. Without a watt meter, students survey and observe their home energy use. Students will calculate energy usage, energy costs, and greenhouse gas emissions.





Renewable Energy (Hydropower)

In this unit, students research the environmental, economic, and social impacts of renewable energy sources and will debate energy source pros and cons. Then students will use the design thinking method to design and build a water wheel using upcycled materials.



2.5 hours

Including lectures, activities, and assignments



Design and Build a Water Wheel

Featured in Lesson 3: Water Wheel Build

Using recycled materials found in their home, students design and create a prototype water wheel, test it by pouring water over it at various heights, and reflect in order build a water wheel with the highest efficiency.





Air Quality

In this unit, students learn about the composition of air, study air pollutants, and identify sources of atmospheric pollutants. This foundation allows students to then analyze the impacts of air pollution on people and the environment. Students are also introduced to the policy cycle, explore air quality laws and regulations, learn about zero-emission vehicles, and engage in action planning for improving air quality in their community.



8 - 9 hours

Including lectures, activities, and assignments

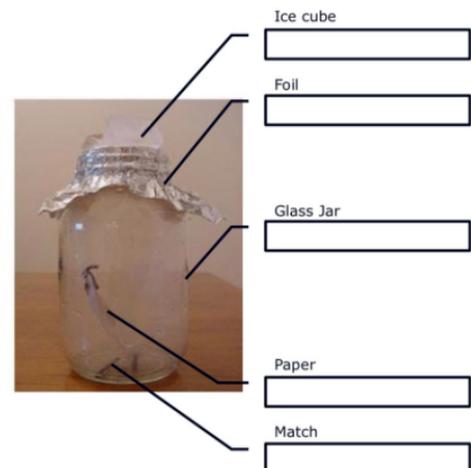


Smog in a Jar

Featured in Lesson 1: Introduction to Air Quality

Students explore the atmospheric composition of air and chemical makeup of air pollutants in the lesson. Then, students demonstrate the chemical reaction that occurs to produce industrial smog in this hands-on activity.

SMOG in a jar components What does each item represent?





Watersheds and Public Water Systems

In this unit, students will master an understanding of the concept of watersheds and the ways in which humans interact with these watersheds. Students explore the movement of water within a watershed, the impact of pollution and sedimentation within watersheds, water quality indicators, and water quality data from their local watershed. Furthermore, students will master understanding of water sources, the systems that source, transport, treat, and deliver water or wastewater, as well as water use management opportunities.



Approximately 17.5 hours*

Including lectures, activities, and assignments

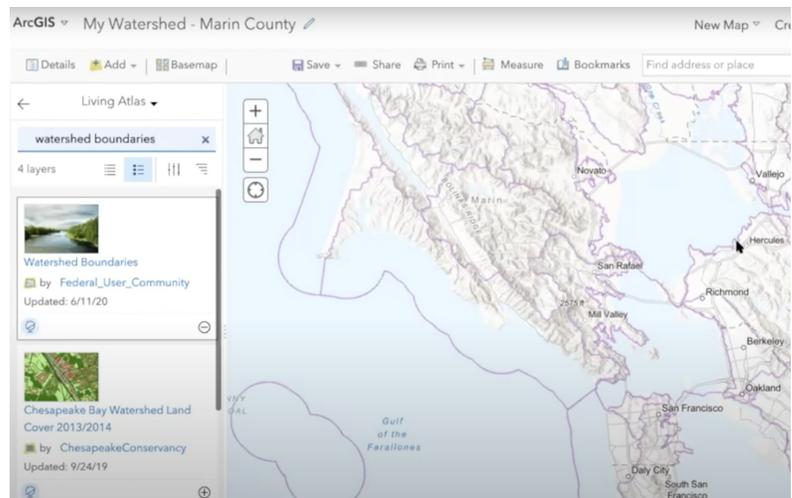
**Additional 5 - 7 hours for unit projects*



Mapping Your Watershed (Unit Project)

Featured in Lesson 3: Mapping Watersheds

In this lesson and associated project, students learn about the basics of Geographic Information System (GIS) mapping and how it can be used as a tool to share information. Students then utilize ArcGIS to create a map of their own watershed.





Student-Facing Curriculum

Sustainability content that is ready to assign to your learners - perfect for asynchronous learning. SEI's student-facing curriculum is adaptable for use with or without internet access.

SEI's student-facing distance learning curriculum is designed to get your students thinking about sustainability across a range of topics from air quality to solar design. All student-facing curriculum is ready to share with your learners and includes vocabulary and background readings accompanied by engaging activities.

Student-Facing Curriculum includes:



Energy Specialist Certificate
(Spanish/English)



Water Conservation
Specialist 101



Air Quality
Science 101



Transportation
Analyst 101



Waste Analysis 101



Energy Consulting 101



Solar Design 101



Earthship
Design Challenge

Click here to request access to Student-Facing Curriculum
or visit energizeschools.org/distancelearning



Energy Specialist Certificate (Spanish/English)

Through four challenges, students dive into their relationship with energy. They can boost their resume and demonstrate their knowledge in energy conservation, efficiency, and communication with an Energy Specialist Certificate. Students who complete all four energy challenges will receive a certificate from SEI's Energize Schools program via email. Challenges can be completed synchronously or asynchronously with in-class time.



4 - 6 hours

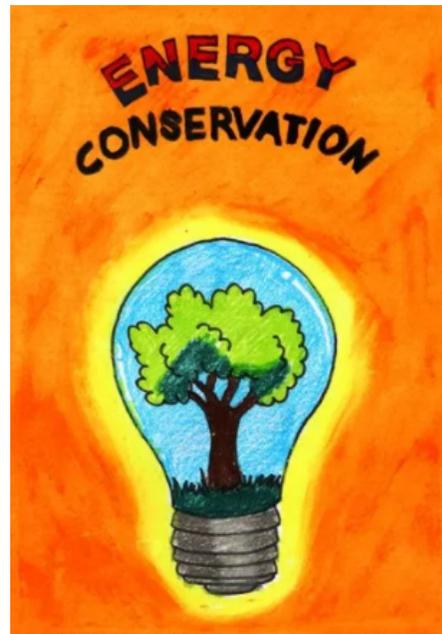
To complete and submit all four challenges



Saving Energy in My Community

Featured in Challenge 4

Students become energy conservation leaders in their community by exploring ways to make a positive impact on people and the planet. They take everything they learned over the course of four challenges to create a campaign that promotes energy savings to their school, peers, and overall community.



Request access to The Energy Specialist Materials or visit energizeschools.org/energyspecialistcertificate



Air Quality Science 101

Through a series of readings and activities, the Air Quality 101 curriculum is designed to train students to be an effective air pollution scientist. This resource includes multiple activities in which students study the formation of smog, observe air quality in their neighborhood, utilize the CalEnviroScreen 3.0 tool, and research low-emissions vehicles. Activities can be done together or standalone and most resources can be accessed without the internet.



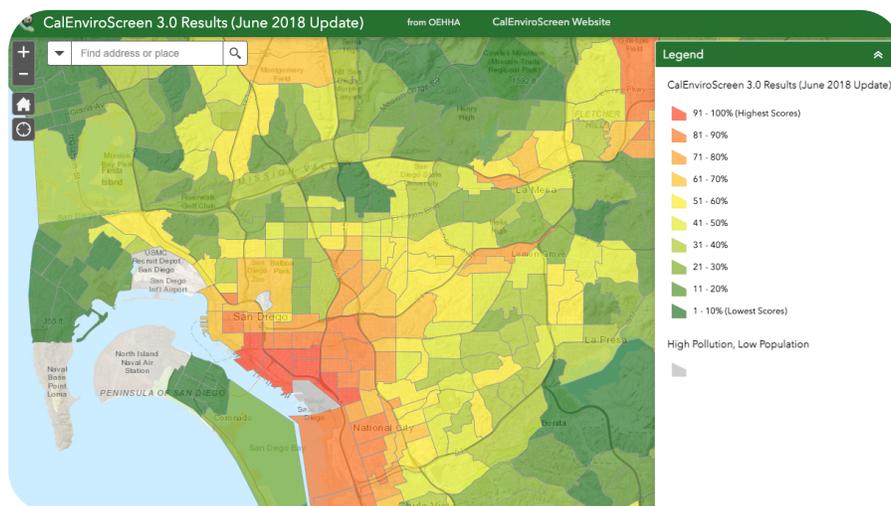
4 - 5 hours

Including readings and activities



Using CalEnviroScreen 3.0: Exploring Environmental Justice in Your City

In the associated reading, students learn about redlining and environmental justice. Then, they utilize the CalEnviroScreen 3.0 tool to observe disproportionate environmental impacts in their neighborhood and city.





Waste Analysis 101

Through a series of readings and activities, the Waste Analysis 101 curriculum is designed to train students to analyze the environmental footprint of our waste production. Students can use this curriculum to learn about the relationship of waste and climate change, consumerism and its impact on waste, and conduct a personal and community waste assessment. Activities can be done together or standalone and do not require the internet or devices.



3 - 4 hours

Including readings and activities



Home Waste Audit

In the associated reading, students learn about how the linear production process contributes to our global waste problem. Then, students measure the amount and types of waste produced in their homes through a waste audit in order to understand how to best implement a personal waste reduction system.





Solar Design 101

Through a series of readings and activities, the Solar Design 101 curriculum is designed to train students on the basics of solar array design. Students can use this curriculum to learn the basics of solar science and site assessment.

Students will utilize the internet to watch videos and conduct research for their solar site analysis.



6 - 7 hours*

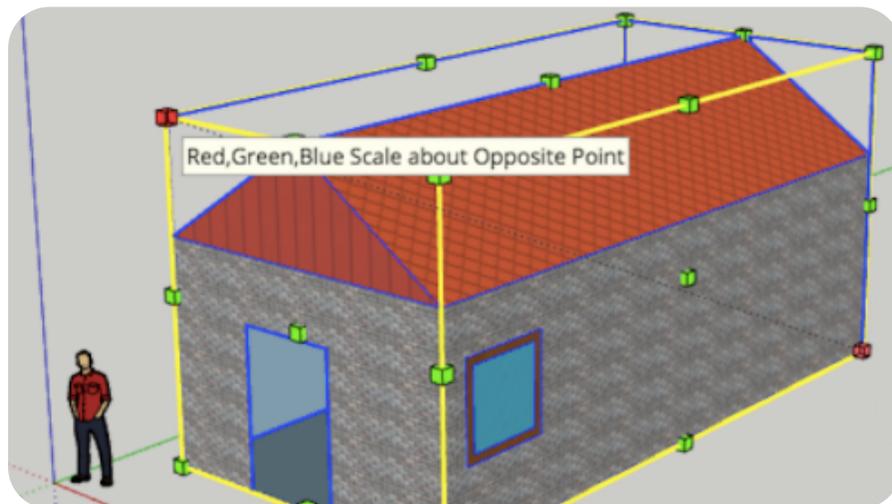
Including readings and activities

**Additional 3-4 hours for optional assignment*



**Solar Modeling with SketchUp
(Optional Assignment)**

SketchUp is a CAD (computer assisted design) software commonly used in engineering and building construction industries. In the optional assignment for this curriculum, students are walked through step-by-step instructions to use SketchUp to design and size a personal solar system.





Water Conservation Specialist 101

Through a series of readings and activities, the Water Conservation Specialist 101 curriculum is designed to train students to be an effective water conservation specialist. Students can use this curriculum to learn about climate change, the water cycle, human impact on water, and conduct a personal water assessment. This curriculum does not require internet or devices.



3 - 4 hours

Including readings and activities



Water Cycle Experiment

In the associated readings, students learn about the water cycle and water scarcity. Then, they further develop their understanding of the water cycle by observing condensation, evaporation, and precipitation in a hands-on experiment.





Transportation Analyst 101

Through a series of readings and activities, the Transportation Analyst 101 curriculum is designed to train students to analyze the environmental footprint of different transportation options. Students can use this curriculum to learn about climate change, modes of transportation, create a sustainable dream vacation, and conduct a personal transportation assessment. This packet does not require internet or devices. Additional resources for teachers are included in a teacher key as part of this packet.



5 - 6 hours

Including readings and activities



My Dream Vacation

In this activity, students plan a dream vacation and calculate the associated energy consumption and greenhouse gas emissions released. Then, as a class, students vote for the best vacation based on fun and impact on the environment.

	Miles per Mean of Transport: Two-week Total	Emissions Assumptions Pounds of Greenhouse Gas Emissions (CO ₂ e) per Passenger per Mile Traveled <small>Source: Sightline Institute</small>	Total Emissions for 2-week Vacation (Multiply # of miles x CO ₂ e per Mile)
Average Car		0.55 (This figure assumes you're traveling with 1 friend)	
Bike		0.001	
Walk		0.001	
Cruise Ship		0.94	
Bus		0.25	
Plane		0.94	
Train		0.4	
Total		---	



Energy Consulting 101

Through a series of readings and activities, the Energy Consulting 101 curriculum is designed to train students to be an effective energy consultant. Students learn how to identify ways to save money and energy through readings and activities such as energy calculations and home energy auditing. This packet does not require internet or devices.



4.5 - 5 hours

Including readings and activities



Personal Energy Assessment

Featured in Lesson 4

Students discover how energy efficient their life is by assessing their personal energy use. Through their assessment, students learn more about insulation, weatherization, lighting, appliances, and heating.





Earthship Design Challenge

Using this simple design one-pager, teachers can challenge their students to build their dream Earthship, a sustainable and fully off-grid home. This resource was designed by a teacher at Mission Viejo High School.



Varies depending on selected deliverables which may include a floor plan, 3D model, and essay.



Earthship Design

Students design an Earthship based on the following six core concepts:

1. On-site electricity production
2. On-site drinking water (i.e. turning rainwater into drinking water)
3. On-site wastewater treatment
4. Passive heating and cooling
5. On-site food production
6. Use readily available/ recycled/ repurposed materials

