



Community Learning Center

Eco Club Curriculum

Mina Reddy, Cambridge Community Learning Center, 2024-2025

2024-2025

More and more, we hear about the climate crisis in the news. We see the terrible effects of extreme heat, storms, floods and wildfires. We have seen millions of people marching and rallying around the world demanding change. We may wonder what is going on and what we can do.

Eco-Club is a mini-course on issues related to the environment with a focus on student leadership on these issues. The course meets once a week for 1 hour and 30 minutes. Students from intermediate and advanced ESOL classes are invited to join.

The course includes presentation of key concepts with use of short videos and hands-on activities; small group and full group discussions and sharing of experiences and ideas; vocabulary for each topic; and preparation to share information with family, friends, and fellow students.

Once students learn about selected topics, they prepare and deliver presentations to their ESOL classes. In addition, they may present to the general student population, as organized by the program.

Curriculum Outline

Week One: Weather and Climate, Greenhouse Gases

Key questions:

- What is climate?
- What is weather?
- What is the atmosphere?
- What are greenhouse gases?
- What is global warming?
- Why is the weather changing?

Week Two: Natural Disasters and Emergency Preparation

Key questions:

- What are natural disasters?
- What are the causes and effects of natural disasters?
- Why are they getting worse?
- What can be done?
- How can we prepare for a natural disaster?

Week Three: Plastic and Zero Waste

Key questions:

- How is plastic made?
- What are the problems with plastic?
- How can we use less of it?
- How can we be creative and waste less?

Week Four: Recycling

Key questions:

- What can be recycled?
- What happens to the things you put in your bin?

Week Five: Transportation

Key questions:

- What are different options for getting around?
- What transportation options are “green”?
- How can public transportation be improved?
- How can we promote “green” transportation in cities?

Week Six: Energy

Key questions:

- What is energy? How is it produced?
- What are renewable and nonrenewable forms of energy?
- How can you use less energy and save money on your bills?

Week 7: Pollution and Health

Key questions:

- What is in the air?
- What is in the water?
- What is in the soil?
- How does pollution affect our health?

Week 8: Soil, Plants, and Biodiversity

Key questions:

- What is healthy soil?
- How is healthy soil related to climate change?
- How do gardens, trees, and green roofs in the city help us?

Week 9: Government Actions

Key questions:

- What are different levels of government doing to slow climate change?
- What international agreements are there?
- What gets in the way of government actions?
- What can private companies do?
- What is one change you want to persuade governments or companies to make?

Week 10: Review

Key question:

- What are the connections between the information and concepts in this course?

Curriculum and Lesson Plans

Week One

Topics: Weather and climate, greenhouse gases

Key questions:

- What is climate?
- What is weather?
- What is the atmosphere?
- What are greenhouse gases?
- What is global warming?
- Why is the weather changing?

Learning Objectives	Assessment
To describe the function(ing) of earth's atmosphere	Reflection
To describe what greenhouse gases do	Reflection
To list some activities that contribute to greenhouse gases	Review activity
To list some activities that will help reduce greenhouse gases	Review activity

Activities	Materials
Offer refreshments. Make name tents and put names on small cards. Warm-up: Students introduce themselves: name, country, ESOL class. Look at student countries on a world map. Students say why they joined the class.	Card stock, markers, refreshments, small cards for names, globe or projected map
Go over the day's agenda Explain class time and dates, answer questions. Show list of topics by week. Explain that students will be presenting to other students in their EOSL classes or students from other classes to share what they learn in this class. Show Google classroom, help students to join. Key questions for the day: • What is climate? • What is weather? • What is the atmosphere? (How is it like a blanket?) • What are greenhouse gases? • What is global warming? • Why is the weather changing?	Class dates on google classroom Curriculum outline on google classroom
Discussion: What is the weather like today? What was the weather like yesterday? What is the weather forecast for tomorrow? What is climate? What is the difference between climate and weather? What are some climates in different parts of the world? (desert, rainforest, temperate, polar, tropical) Show the first minute of NASA video: https://climatekids.nasa.gov/weather-climate/ In groups of 2-3, talk about climate change effects you have noticed in your country or in the U.S. Report to the whole class. Type notes on a google doc as they speak.	
Introduce the concept of the atmosphere. Like a blanket around the earth. What do we need in the air? Oxygen, nitrogen, carbon dioxide, water vapor, other gases. What gives us heat? What is a greenhouse? Show an image of a greenhouse for growing plants—lets sun and heat in, doesn't let heat out.	
Video on the greenhouse effect: https://climatekids.nasa.gov/greenhouse-effect/ Stop periodically and discuss what they understood. Ask questions.	
Give students (or pairs of students) a card with an action that creates emissions, e.g. using diesel. Have them come up and put a scarf/shawl on me, saying, "I am....to..." Start feeling cold, reach perfect point, then start feeling hot. (Need to dress in light shirt)	Cards with greenhouse gas creating actions, pile of scarves

Then give them cards with actions that reduce greenhouse gases, e.g. walking. Have them say what they are doing. Take off a scarf/shawl for each action.	
Recap: What are some actions that pollute the atmosphere and make it too warm? What are some actions that help the atmosphere to be stable?	
Show the Union of Concerned Scientists website for further information. https://www.ucsusa.org/climate	
Introduce our Quizlet class, help people to join. Show the set for today's words. Vocabulary review: Atmosphere, Greenhouse, Greenhouse gas, Fossil fuel, Weather, Climate, Forecast, Temporary, Blizzard, Flood, Diesel, Coal, Natural gas/methane	Quizlet
Reflection: In your notebook, write two facts you learned today that you will tell your family or classmates. Write a question you have about the atmosphere or climate.	Journals (blue exam books)

Vocabulary:

Atmosphere	Gases that surround the earth and affect our climate
Greenhouse	Glass building in which plants are grown to protect them from cold weather
Greenhouse gas	Gas that traps heat in the atmosphere
Fossil fuel	Energy source made of decayed plants and animals: coal, oil, natural gas
Weather	State of the air at a particular time and place, e.g. rainy, cloudy, sunny, windy
Climate	Long-term pattern of weather in a particular area
Forecast	What the weather is likely to be
Temporary	For a short time
Blizzard	Snowstorm with a lot of snow and strong winds
Flood	Overflowing of water
Diesel	Fuel used for some cars, trucks, and boats; made from oil
Coal	Black rock that is burned for fuel
Natural gas/methane	Fossil gas that is mostly methane; used for fuel
Cement	Chemical substance used for construction to bind things together
Cow	Large animal that people raise for milk

Solar	From the sun
Wind	Movement of air
Repair	To fix something broken
Evacuation/Evacuate	To leave a dangerous place

Extension activities/teacher resources:

Quizlet vocabulary review

Read material on Union of Concerned Scientists website: <https://www.ucsusa.org/climate>

National Geographic page on the atmosphere:

<https://education.nationalgeographic.org/resource/atmosphere/>

Center for Climate and Energy Solutions, Climate Basics for Kids:

<https://www.c2es.org/content/climate-basics-for-kids/>

Week Two

Topics: Natural Disasters and Emergency Preparation

Key questions:

- What are natural disasters? Why are they getting worse? What can be done?
- How can you prepare for a natural disaster?

Learning Objectives	Assessment
To demonstrate understanding of the definition of 4-7 natural disasters	Vocabulary quiz
To present summary information on a reading to the class	Jigsaw activity
To list what to include in an emergency kit	Small group activity selecting items for backpack

Activities	Materials
Warm-up: Students introduce themselves: name, country, one thing they remember from the last class and/or a question they have about class content. Did you tell anybody about what you learned in the last class? Who and what?	Name cards
Agenda	
Introduce natural disasters. Ask for examples. (<i>Acknowledge this may be difficult/painful for some students.</i>) Show video overview of natural disasters. Pause to discuss. Natural Disasters for Kids (Learn Bright) https://www.youtube.com/watch?v=ay416AyoqRU	Video

Talk in pairs about any experience or knowledge of a natural disaster. Report out what your partner told you. See photos of recent event.	
Jigsaw—give each group of 2-3 a FEMA fact sheet about a natural disaster (hurricane, earthquake, tornado, flood, extreme heat, winter storm, wildfire), have them read it together, plan and present to the class. https://www.ready.gov/be-informed What is a _____? What can you do to protect yourself? What should you not do? Show short videos on google classroom to watch at home. Floods: https://www.youtube.com/watch?v=4PXj7bOD7IY vocabulary: sea level, levee, vulnerable, Tornado: https://www.youtube.com/watch?v=aacHWOB7cmY Wildfires: https://www.youtube.com/watch?v=5hghT1W33cY	FEMA fact sheets
Introduce causes and effects of natural disasters or climate change. Each student list one cause and one effect. Discuss responses. How is climate change related to natural disasters? See PBS article (linked on classroom).	PBS article Cause and effect graphic organizers
Vocabulary review/quiz—Show definitions on Quizlet, students write word, check together by flipping flashcard. Definitions: 1. A very dry period 2. Cold, wind, and a lot of snow 3. Rain and very strong wind 4. Water rising high up in the streets and houses 5. Rocks and earth moving down a slope 6. Very high ocean waves 7. A mountain that can erupt with lava 8. A sudden shaking of the ground 9. Frozen balls falling from the sky	Quizlet
Emergency preparation. Discuss, see checklist Explain idea of an emergency bag. Divide class into groups of 4. Lay out items on a table: bandages, pens, toilet paper, coins, cans of food, games, books, bottled water, etc. Check that they know the words for each group of items. Give each group a backpack. Tell them they can take 8 items. Discuss together what to choose and take put them in the backpack. Then have each group explain what they took and why. What else is important to include? Compare to checklist. Do you have an emergency bag at home? Will you prepare one now?	Emergency preparation checklist Items to consider for emergency bag Backpacks
Show mass.gov site for further information Climate groups: CREW (Communities Responding to Extreme Weather) https://www.climatecrew.org/	

Reflection: What will you do with your family to be better prepared for an emergency?	Journals
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Vocabulary:

Drought	A very dry period
Blizzard	Cold, wind, and a lot of snow
Hurricane or cyclone	Rain and very strong wind
Flood	Water rising high up in the streets and houses
Landslide	Rocks and earth moving down a slope
Mudslide	Wet earth moving down a slope
Tsunami	Very high ocean waves
Volcano	A mountain that can erupt with lava
Earthquake	A sudden shaking of the ground
Hail	Frozen balls falling from the sky
Sleet	Freezing rain
Sea level	Height of the sea where it meets the land
Vulnerable	Can be physically or emotionally hurt
Deforestation	Cutting down too many trees
Dehydration	When your body does not have enough water

Extension activities/teacher resources:

Photos or short videos:

Floods: <https://www.youtube.com/watch?v=4PXj7bOD7IY>

Tornado: <https://www.youtube.com/watch?v=aacHWoB7cmY>

Wildfires: <https://www.youtube.com/watch?v=5hghT1W33cY>

Background information on the relationship between climate change and natural disasters:

<https://www.pbs.org/wnet/peril-and-promise/2022/09/how-climate-change-impacts-each-type-of-natural-disaster/>

Quizlet vocabulary review

Week Three

Topics: Plastic and Zero Waste

Key questions:

- How is plastic made?
- What are some problems with plastic
- How can we use less of it?

- How can we be creative and waste less?

Learning Objectives	Assessment
To explain the ubiquity of plastic	Pair listing
To explain some ways to reduce plastic usage	Small group listing
To explain ways of reducing waste and reusing things	Reports from small groups

Activities	Materials
Warm-up: Did you prepare an emergency kit at home? Did you talk to anyone about it? Ask them to bring in their bag next week to show their classmates and explain what they included.	Name cards
Agenda Review of google classroom postings.	
Review natural disaster vocabulary. Given the definition, write the word in their blue books. Check together. 1. A very dry period 2. Cold, wind, and a lot of snow 3. Rain and very strong wind 4. Water rising high up in the streets and houses 5. Rocks and earth moving down a slope 6. Very high ocean waves 7. A mountain that can erupt with lava 8. A sudden shaking of the ground 9. Frozen balls falling from the sky 10. Cutting down too many trees 11. Freezing rain 12. When your body doesn't have enough water	
Introduce topic of plastic. What is plastic? Definition: a synthetic material that can be made into different shapes. Source: generally from oil or gas, but can be made from plant material. Heat, separate, add other chemicals. What are some plastic things in the classroom? Look around and point out. In pairs, list as many things as you can in your house that is made of plastic. Share some examples. Which ones are single-use plastic? Have you seen more plastic used in your country recently?	
What is the problem with plastic? Ask for ideas. (waste, oceans, animals, human health, etc.) Story of stuff video (4 mins): https://www.storyofstuff.org/movies/story-of-plastic-animation/ Black plastic source (from electronics)	

Bottled water: Do you buy bottled water? Why? Where does it come from? Who needs bottled water? How much does bottled water cost? Do the calculation. E.g. 2 bottles/day x \$1.50 x 365 days = \$1095.00 Tap water would be less than \$3.00 The Story of Bottled Water (8 mins): https://www.storyofstuff.org/movies/story-of-bottled-water/?_gl=1*1l9qm7c*_ga*MTQzODM4MDQ5OC4xNjk5MzA2ODQ5*_ga_07NEEFKJ2N*MTY5OTMwNjg0OS4xLjAuMTY5OTMwNjg0OS4wLjAuMA..	
Discuss alternatives to plastic. How can you use less plastic? Discuss in groups of 3 and present ideas to class. Bring a few items: tea bags, loose tea, reusable bags, refillable water bottle Places to refill containers if available in the community Group: Beyond Plastics—link to website on google classroom: https://www.beyondplastics.org/learn	tea bags, loose tea, reusable bags, refillable water bottle, rags, plastic containers, glass containers
Reduce, reuse, recycle: Show diagram, talk about each stage.  Reduce Reuse Recycle How is waste related to climate change? In pairs/small groups, come up with 3 ideas to reduce and 3 ideas to reuse things (non-food items). Report out.	
Places you can donate or obtain goods: List local places	
Food waste: how much is wasted in the U.S.? Is it different from your experience in your country? About 30% of food is wasted worldwide, 40% in U.S. In poorer countries, lack of storage and access to markets. In richer countries, consumer waste In pairs/small groups, think of advice you could give to Americans to reduce their food waste. Report out.	
Show Boston Zero Waste cooking video. https://www.youtube.com/playlist?list=PL5YpM4O2fgyqiXc9lBbPIVyeoPRkSB1La https://www.youtube.com/watch?v=IEKMfK3Edyl&list=PL5YpM4O2fgyqiXc9lBbPIVyeoPRkSB1La&index=2 Articles on what to do with food. Recipes, processes. Show links on google classroom. What do you do with leftovers?	
Develop questions on recycling for next week's presentation.	
Reflection: What do you already do to not waste too much? What will you do to waste less? What will you tell your family and classmates?	Journals

Vocabulary:

Single-use plastic	Plastic item that is used only once and thrown away
Fracking	Getting oil or gas from deep rock by forcing a liquid into it
Pollution	Addition of harmful materials into the environment
Petrochemical	Chemical made from petroleum or natural gas
Landfill	Place to pile up garbage
Incinerate/incinerator	Burn trash/machine to burn trash
Toxic	Poisonous
Recycle	Make something new from an object
Policy	Law or practice made by government or other institutions
Compost	Decayed organic material used as a fertilizer
Repair	Fix something broken
Beverage	A drink
Litter	Trash we drop or throw on the ground
Organic	Made from living things
Decompose	Break down
Textiles	Cloth or clothing, towels, sheets, etc.
Rag	Old cloth

Extension activities/teacher resources:

Videos on plastic:

The story of plastic:

<https://www.storyofstuff.org/movies/story-of-plastic-animation/>

Organizing against plastic

<https://www.storyofstuff.org/plastic/>

Bottled water: manufactured demand:

https://www.storyofstuff.org/movies/story-of-bottled-water/?_gl=1*1l9qm7c*_ga*MTQzODM4MDQ5ODQ4xNjk5MzA2ODQ5*_ga_07NEEFKJ2N*MTY5OTMwNjg0OS4xLjAuMTY5OTMwNjg0OS4wLjAuMA..

Solutions: (long video)

<https://www.storyofstuff.org/movies/movies-sp-series-intro/>

CNN report on bottled water: <https://www.cnn.com/2023/03/16/world/plastic-water-bottles-un-report->

climate/index.html#:~:text=More%20than%201%20million%20bottles,to%20nearly%20double%20by%202030.

Videos on food waste:

Boston Zero Waste Cooking Videos:

<https://www.youtube.com/playlist?list=PL5YpM4O2fgyqiXc9IBbPIVyeoPRkSB1La>

<https://www.youtube.com/watch?v=IEKMfK3Edyl&list=PL5YpM4O2fgyqiXc9IBbPIVyeoPRkSB1La&index=2>

Recipes for using leftover food:

<https://foodwastefeast.com/>

Food waste hierarchy article and illustrations:

<https://www.reuters.com/graphics/FOOD-WASTE/SOLUTIONS/lgpdlkllpo/>

City of Cambridge Reduce and Reuse Webpage

ideas:<https://www.cambridgema.gov/Services/reducereuse>

Week 4

Topic: Recycling

Key questions:

- What can be recycled?
- What happens to the things you put in your bin?

If possible, have a local recycling staff person do this presentation. This will provide opportunities for students to interact with another person and to ask relevant questions.

Learning Objectives	Assessment
To demonstrate what can be recycled in your town	Object sorting
To ask appropriate questions	Q&A

Activities	Materials
Warm-up: If there is a guest speaker, students introduce themselves and say one thing they have learned in this class.	Name tents
Agenda	
Discussion: What is recycling? Why do we do it? Did you do it in your country? What happens in a recycling center? Talk in small groups, then report to full group. Show a video of a recycling center. https://www.youtube.com/watch?v=NOHIPfI3c90	

Give an overview of different types of bins (recycle, trash, compost, city textile drop-off) and recyclable objects, using pictures and actual objects. Introduce vocabulary.	Bins, objects to recycle or not
Cambridge DPW online recycling game. As a class, decide what to move into which bin and why. Take turns moving items into the correct bins. https://cambridgema.recycle.game/	
Hands-on activity sorting items for recycling in groups of 4-5. Communicate with each other about what you are doing.	Bins, objects to recycle or not
Discussion, questions and answers on recycling What are some problems with recycling?	
Vocabulary review: fill in the blanks worksheet Quizlet	Fill in blanks, Quizlet
Plan times for pairs of students to do recycling presentations for other students during class or during breaks in classroom or common areas.	
Reflection: Write one thing that surprised you in today's lesson. Write one idea for how you will teach other people what you learned today about recycling.	Journals

Vocabulary:

Refillable	Can be filled again, e.g. a water bottle
Recycle	To make something new by processing something
Rag	Old cloth used for cleaning
Beverage	A drink
Incinerator	Place to burn trash
Landfill	Big pile where trash is taken
Litter	Trash we throw on the ground
Organic	Made from living things
Decompose	To break down
Toxic	Poisonous
Textile	Cloth like clothing, towels, sheets
Compost	Decayed organic material used as a fertilizer
Container	Object like a box or jar for holding things
Rigid	Hard to bend

Student leadership activities:

Play the recycling sorting game with fellow students during class breaks in the classroom or common space. (Sorting physical objects into labeled containers)

Show the Cambridge DPW online waste sorting activity (<https://cambridgema.recycle.game/>) to classmates and the Get Rid of It Right page (<https://www.cambridgema.gov/Departments/publicworks/getridofitright>). Put them on the board in the student lounge.

Extension activities/teacher resources:

For Cambridge residents, visit the DPW recycling center at Hampshire Street and drop off some plastic bags or printer ink

Play the online waste sorting game with your family or friends or in your class (<https://cambridgema.recycle.game/>).

Week 5

Topic: Transportation

Key questions:

- What are different options for getting around?
- What transportation options are “green”?
- How can public transportation be improved?
- How can we promote “green” transportation in cities?

Learning Objectives	Assessment
To be prepared to demonstrate to fellow students what to recycle in Cambridge	Presentation to class
To identify more and less polluting transportation options	Class brainstorm
To list ideas to make transportation less polluting	Small group discussion and report out

Activities	Materials
Warm-up: Tell us one thing you learned in the last class and one thing you told someone else.	Name tents
Agenda	
Review of key points of recycling presentation.	Slides from last class
Group students according to their ESOL class. Have each group present to the class on recycling in preparation for a presentation to their ESOL classes. Feedback on the presentations.	Materials that can and cannot be recycled; boxes to sort items into

Introduce topic of transportation: How do you get to school? List all the methods of transportation we can think of in the U.S. and in their home countries. Divide the list into polluting, non-polluting, and less polluting. See circle graphs for relative pollution by different sectors and by different types of transportation: https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions	Pictures of different modes of transportation
See first 2 minutes of video of bicibus in Barcelona: https://www.youtube.com/watch?v=5iwYkkqXTh0 And bike bus in U.S. (2 minutes, CBS report): https://www.youtube.com/watch?v=sl279wht6cs	videos
In small groups, write ideas to reduce pollution from transportation. Why don't people use those methods more? How can we make it easier for people to use greener methods? What can governments do? Discuss together. Video from Planete Energie on sustainable mobility options: https://www.youtube.com/watch?v=b93wkhn2wxM Compare to our ideas. Link: Cambridge Net Zero Transportation Plan: https://www.cambridgema.gov/Departments/communitydevelopment/netzerotransportationplan Draft ideas from the City: EV charging availability, employers give discount T-passes, better sidewalks and crossings, bike lanes, bike education, bus priorities, shuttles	
If time, vocabulary review: fill in the blanks worksheet Quizlet	Fill in blanks, Quizlet
Reflection: How prepared do you feel to present to your class about recycling? How do you travel in the city? Are there any transportation changes you and your family could make?	Journals

Vocabulary:

Transportation	A way to travel from one place to another
Vehicle	Something used to transport people or goods, like a car or truck
Electric vehicle (EV)	A vehicle that runs on electric power
Battery	A device that produces electricity
Lithium	Metal that is used in batteries
Charging station	Place to charge your car battery
Walkable city	A city where you can easily walk to what you need, e.g. stores, hospital
Electric bicycle	A bicycle with an electric battery

Cargo bicycle	A bicycle with a box or basket to carry goods or people
Scooter	An open vehicle with two wheels and a platform
Diesel	A fuel made from oil to use in motor vehicles
Gasoline	A fuel made from oil to use in motor vehicles
Net Zero	The amount of greenhouse gases emitted is equal to the amount removed from the atmosphere
Mobility	Ability to move
Fuel efficiency	How much energy an engine gets from a certain amount of fuel

Student Leadership Activity:

Survey students to find out how they get to school. Research bus routes and schedules and match them to school hours. Present the results to staff.

Extension activities/teacher resources:

Graphic on emissions, some videos on transportation (not good for class):

<https://grist.org/climate/lesson-plan-transportation-climate-electric-vehicles/>

Bike bus (kids to school) Glasgow, BBC:

https://www.google.com/search?sca_esv=c8c65b53b193be60&sca_upv=1&rlz=1C1GCEA_enUS1060US1060&q=children+biking+to+school&tbm=vid&source=lnms&prmd=ivnsmbt&sa=X&ved=2ahUKEwih0J-rwr2GAxXqrokEHbYZDYkQ0pQJegQIDBAB&biw=1647&bih=807&dpr=1.17#fpstate=ive&vld=cid:fbf96086,vid:7HXuo7dExAg,st:0

Barcelona bicibus—hundreds of kids:

<https://www.youtube.com/watch?v=5iwYkkqXTh0>

Week 6

Topic: Energy

Key questions:

- What is energy? How is it produced?
- What are renewable and nonrenewable forms of energy?
- How can you use less energy and save money on your bills?

Learning Objectives	Assessment
To list 4 sources of energy	
To list 2 ways to save energy	Reflection journal and small group reports

Activities	Materials
Warm-up: How much energy do you have now? When do you have more energy? When do you have less energy?	Name tents
Agenda	
Students report on experience presenting on recycling to their classes	
Energy: what is it? Definition: ability to do work, cause movement PBS video: Energy Overview: Energy Is Everything https://mass.pbslearningmedia.org/resource/energy-overview-energy-is-everything-unc-tv-science/unc-tv-science-animation/ Discussion: What are some ways we are using energy in the classroom? How do you use energy in your home? What kind of energy is that?	video
Energy: ways to create electricity and heat Renewable (biomass, solar, wind, water, geothermal) and nonrenewable (oil, coal, gas, nuclear) energy Teach Engineering visuals (not the video): https://www.teachengineering.org/lessons/view/cub_environ_lesson09 Images of wind farms, solar arrays (agrovoltaic) Geothermal energy: Eversource video Geothermal Eversource Or see first minute of HEET video on geothermal energy: https://heet.org/geo/	Videos, visuals
Small group discussion and report out: How can you save energy and save money on your bills? (E.g. turn lights off, use shades, hang clothes to dry, turn off computers, don't leave fridge open, seal air leaks, insulate, put AC at 74-78) Hand out cards from Cooler Communities showing ways to save or waste energy. In small groups, sort the cards into two piles and discuss those and other ideas to save energy. Report on any ideas not already presented. https://drive.google.com/file/d/1cL-menML-a2VsrbcDhnmtF85PVeXaRVT/view (from energy detectives.org) Show Cambridge Energy Alliance tips: https://cambridgeenergyalliance.org/resources/spring-summer-energy-tips/	Cooler Communities cards
Cambridge Energy Alliance resources Explain about alternative utility companies (and scams), energy bill check-up, home energy assessment https://cambridgeenergyalliance.org/	
Make a poster for your home or classroom on how to save energy. Choose one or more of the ideas we discussed.	Paper, colored pencils,

	markers, crayons
Reflection: What will you do to save energy? What will you tell your family, friends, and classmates about how to save energy?	Journals

Vocabulary:

Energy	Ability to do work, create movement
Thermal energy	Heat energy
Thermostat	Tool to set the temperature
Thermometer	Tool to measure temperature
Thermos	Container that keeps drink hot
Renewable	A resource that can replace itself
Biomass	Materials from living things, such as wood and corn, that contain stored energy
Solar	From the sun
Wind	Movement of air
Geothermal energy	Heat from under the ground
Hydroelectric power	Energy from moving water
Nonrenewable	A resource that is used up
Nuclear energy	Energy created by splitting an atom
Wind farm	Group of wind turbines to produce energy
Insulation	Material used to maintain temperature
Conservation	Protecting natural resources
Efficiency	Working with the least waste of time, energy, or resources
Transfer	To move from one object or person to another

Student leadership activity:

Hang up your Save Energy poster in your classroom or find a place in a common area to display it. Show it to your classmates and talk about it.

Extension activities/teacher resources:

Hydropower video: <https://www.youtube.com/watch?v=q8HmRLCgDAI>

Energy Detectives website/lesson plan:

<https://energydetectives.org/curriculum-4th-grade/lesson-2/>

Video from Mighty Owl Science on energy transfers:

<https://www.youtube.com/watch?v=VhIBReUVSk8>

Cooler Communities energy sources poster:

<https://drive.google.com/file/d/1pt3uBhAj39Ltl9WWDgY8K03NYYaeGPJf/view>

PBS video on heat pumps (air source and geothermal):

<https://www.youtube.com/watch?v=RdzjrVwWz4o>

Week 7:

Topics: Pollution and Health

Key questions:

- What is in the air?
- What is in the water?
- What is in the soil?
- How does pollution affect our health?

Learning Objectives	Assessment
To match vocabulary from prior classes with definitions	Vocabulary game
To describe understanding of and experience with pollution	Description of picture and experience
To list several sources of air pollution	Post-its, discussion
To list ways to reduce exposure to indoor air pollution	Journal entry

Activities	Materials
Warm-up: vocabulary review game Put words on the board. Students come up. Give definition, student crosses out the word. • Energy source made of decayed plants and animals: coal, oil, natural gas (fossil fuel) • Snowstorm with a lot of snow and strong winds (blizzard) • To fix something broken (repair) • A very dry period (drought) • Cutting down too many trees (deforestation) • Place to pile up garbage (landfill) • Poisonous (toxic) • Made from living things (organic) • Hard to bend (rigid) • Tool to measure temperature (thermometer) • A resource that can replace itself (renewable)	Name tents Vocabulary list

• Heat from under the ground (geothermal energy) • Cloth like clothing, towels, sheets (textile) • Trash we throw on the ground (litter) • A mountain that can erupt with lava (volcano)	
Agenda Discuss presentations done or planned: recycling, saving energy, emergency bag	
Pollution: What is it? “Pollution is the presence in or introduction into the environment of a substance or thing that has harmful or poisonous effects. It is the contamination of air, water, or soil that are dangerous to living organisms. It can happen naturally, such as through volcanic eruptions, or as a result of human activities, such as through oil spills in the ocean.” (from ocstem.org lesson plan) Give students paper, crayons, colored pencils. Have each student draw a picture of pollution. Describe to the class what the picture represents.	Colored pencils, paper, crayons
Discuss your experience with pollution: air, water, soil in your country and in the U.S. –whole group discussion	
Air pollution: What are some sources of indoor air pollution? What can you do to reduce pollution inside your home? Discuss in small group and report out. (e.g. stove, cleaning products, body washing products, dust, construction products, mold, cigarettes; items with scents/fragrances) Whole group: What are some sources of outdoor air pollution? Put ideas on post-its and post on wall. Look at responses together. How can you reduce your exposure? (e.g. fires, construction, methane, car exhaust, factories) American Lung Association: https://www.lung.org/clean-air/indoor-air/indoor-air-pollutants Discuss: What health problems can air pollution cause? (E.g. asthma, lung cancer, COPD, headaches, bronchitis, pneumonia, stroke) Watch video on causes and effects of air pollution and ways to reduce it (3 minutes): https://www.youtube.com/watch?v=t7Q7y_xjR5E	Post-its
Water pollution: Leaves, litter, soaps, agricultural runoff (fertilizer, pesticide, manure), plastic, sewer overflow, oil spills, lead pipes What are the results of water pollution? https://www.youtube.com/watch?v=Om42Lppkd9w Place to leave unused medications: for Cambridge residents, Cambridge Police Station, 125 Sixth St.	
Land/soil pollution: brief discussion of sources and effects, solutions	

Chemicals (agriculture), mining, waste disposal, military activities (Regenerative farming https://www.youtube.com/watch?v=fSEtiixgRJI)	
Show website of one climate advocacy group: Clean Water Action- cleanwater.org	
Reflection: Name one action you will take or one thing you will change in your house to reduce indoor air pollution. Name one thing you will tell your friends, family, and classmates about indoor air pollution.	Journals

Vocabulary:

Pollution	Damage caused to water, air, or earth by harmful substances or waste
Poisonous	Something that can kill you or make you sick
Mold	Fungus that grows on old food or wet things
Litter	Trash thrown on the street
Construction	Building
Indoor	Inside a building
Outdoor	Outside
Exhaust	Gas coming out of an engine as waste
Asthma	A lung disorder with obstructed breathing
Bronchitis	A lung disease
Pneumonia	A lung infection
COPD (chronic obstructive pulmonary disease)	A lung disease that makes it hard to breathe
Cancer	A disease in which abnormal cells grow uncontrollably
Stroke	Loss of blood flow to part of the brain
Dizziness	Feeling unsteady or feeling the world is turning fast
Fertilizer	Material used to help plants grow
Pesticide	A chemical used to destroy insects or other pests
Mining	Digging out valuable materials from the earth or sea
Sewage	Waste water that is carried away from buildings in pipes

Extension activities/teacher resources:

Identify items in your house that may be polluting the air (emitting volatile organic compounds). Look for alternatives.

Week 8:**Topics: Soil and Plants****Key questions:**

- What is healthy soil?
- How is healthy soil related to climate change?
- How do gardens, trees, and green roofs in the city help us?

Learning Objectives	Assessment
To express basic facts about the relationship between soil, plants, and carbon	Reflection journal
To demonstrate recall of topics covered in prior classes	Review activity

Activities	Materials
Warm-up: Vocabulary review	Name tents
Agenda: Introduce guest presenters from Healthy Soils Action Group (Mothers Out Front)	
Review: Tell the guests something you have learned about one of the topics we have covered. Display list of topics.	List of topics covered
Soil and Carbon: guest presenters Go over new vocabulary. Kiss the Ground video on soil and carbon: https://classroom.google.com/c/Nzl2NDUyNjQzNTMx/m/NzQ0NjMxNTcyMjM3/details Demonstrate the difference between aggregated soil with microorganisms and degraded soil. Pour water over flour and see what happens. Pour water over a slice of bread and see what happens. Discuss the difference you observe and what it means.	Video from Kiss the Ground Soil, pitcher of water
Small group discussion: • How is farming/agriculture done in your home country? • Did you live in the city or outside the city? • Are there trees in your home city? • Do you have contact with soil or food growing here in the US? (Do you want it?)	

• How is the soil in your home country? Are there protections? Concerns? • What do you see as the main challenge of climate change?	
Report to the full group.	
Reflection: Write two facts you learned about soil and plants. Write one question you have about nature.	Journals

Vocabulary:

Soil	Material on the top of the earth
Agriculture	Working with the soil, growing food, fiber, fuel, and raising livestock
Balance	A condition of stability
Livestock	Animals raised on farms
Compost	Decayed leaves and food scraps which is used to improve soil
Microorganism	A tiny living thing (micro = tiny, organism = living thing)
Nutrient	Something which promotes growth
Photosynthesis	The process used by plants to pull carbon from the air, combine it with water and minerals, and create sugar (carbohydrates) and oxygen
Regenerate	To give new life or energy to
Resilient	Able to recover quickly

Extension activities/teacher resources:

Didi Pershouse video showing the activity illustrating different soil composition:

<https://classroom.google.com/c/Nzl2NDUyNjQzNTMx/m/NzQ0NmMxNTcyMjM3/details>

Land/soil pollution: brief discussion of sources and effects, solutions

Chemicals (agriculture), mining, waste disposal, military activities

Regenerative farming

<https://www.youtube.com/watch?v=fSEtiixgRJI>

Video: Plants Cool the Planet

<https://bio4climate.org/plants-cool-the-planet/>

Visit a local Miyawaki forest

Video from Biodiversity for a Livable Climate on Green-Rose Park Miyawaki planting:
<https://bio4climate.org/miyawaki-forest-program/>

Look for signs of nature and report in the next class.

Week 9:

Topics:

Role of government, international organizations, and private companies in fighting climate change

Key questions:

- What are the different levels of government?
- What can each level of government do to fight climate change?
- What can international organizations do to fight climate change?
- What can private companies do to fight climate change?
- How can we pressure governments and companies to make changes?

Learning Objectives	Assessment
To identify an action that each level of government can take to fight climate change	Discussion and reflection
To identify an action that a private company can take to fight climate change	Discussion and reflection
To name an international agreement on climate change	Discussion
To write a letter to ask for a change	Letter

Activities	Materials
Warm-up: Discuss upcoming presentations	Name tents
Agenda	
Vocabulary review Do activities with Quizlet as a whole class, e.g. learn or match	Quizlet
Levels of government: Overview--What are the three levels of government? Federal, state, local (municipal); also executive, legislative, and judicial. Local government: look at city website, discuss departments and what they are responsible for. What can they do about climate change? E.g. public works (recycling, electric trash vehicles, parks), library (educational materials), traffic and parking (bike lanes), community development (business programs), arborist (trees), City Council (building codes)	

State government: look at state website, mass.gov. Which departments are most relevant? What do they do/what can they do about climate? Funding for local projects, green bank	
Federal government and Congress: laws, regulations (e.g. vehicle emissions), funding, tax breaks, research, energy efficiency standards	
What is the IPCC? How can countries work together to fight climate change? See video: https://planetnutshell.com/portfolio/how-the-world-can-tackle-climate-change/	
Discussion: What can private companies do to fight climate change? E.g. packaging, energy efficiency, plastic reduction, using renewable energy, electric vehicles	
Story of stuff video (citizen power): https://www.storyofstuff.org/movies/story-of-change	
Discussion: What is one change you want to persuade governments or private companies to make? (Could be a building manager) Together, write letters asking for change.	
Reflection: Write about one change you want from the city government. Write about one change you want from a private company.	Journals

Extension activities/teacher resources:

Story of stuff story of solutions: (Meaning of GDP, economic goals)

<https://www.storyofstuff.org/movies/the-story-of-solutions/>

Week 10:

Topics:

Review

Key question:

What are the connections between the information and concepts in this course?

Learning Objectives	Assessment
To demonstrate understanding of key vocabulary from course	Bingo, categorization game
To describe connections among course concepts	Discussion of connections
To explain cause and effect relationships among course concepts	Cause and effect graphic organizers

Activities	Materials
Warm-up: Today is the last class. How do you feel? Plan additional presentations to other students.	
Agenda	
Vocabulary review: Bingo Display list of words. Have students fill them in randomly on their bingo cards. Give definition, students put penny on space with the matching word if they have it on their card.	Blank bingo cards, coins as chips
Vocabulary review: In pairs, come up with as many words as they can to fit categories: natural disasters, energy, pollution, recycling, transportation. Go around and have each pair choose words to explain. Show lists of vocabulary on google classroom.	List of categories
Talk about connections. What is the connection between.... Greenhouse gases and natural disasters? Trees and pollution? Plastic and zero waste? Energy and pollution? Soil and food? Landfills and carbon? Pollution and asthma? Cars and pollution? Governments and climate change? Students may suggest other pairs from the vocabulary lists. Write pairs of words on the board, have students discuss connections in pairs, then report to the full group.	
Cause and effect graphic organizers In pairs, fill out cause and effect forms with climate change items. Choose some to display and explain to the class.	Graphic organizers
Letter to government or companies Review the letters drafted in the last class. Tell classmates what you wrote about. Will this action help with climate change? Revise letters, make corrections, check addresses, prepare to send.	
Reflection: What is the most interesting thing you learned in this class? What is the most surprising? What changes have you made in your life? What have you told other people?	Journals