



Connecting Cultures, Exploring Science: Road to Doha

Educator Handbook 2013 - 2014





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Road to Doha: Program Overview

- **Introduction**
- **Learning Objectives and Learning Outcomes**
- **Scope and Sequence**



Introduction

Connecting Cultures, Exploring Science: Road to Doha (R2D) is a yearlong science-based classroom program that engages high school students in Qatar and North America around climate change. In partnership with [Qatar Foundation International \(QFI\)](#), R2D explores critical environmental issues through addressing the Driving Question **“How do we, as youth, impact climate change in our communities?”** In this program, students utilize place-based education to deliberate the most pressing climate change concerns of our time. Students will use technology to share information, interact across cultures, and collaborate to take positive action in their local and global communities.

In order to focus their collaboration, the students will be asked to think about the question: **“How will climate change affect the future you want for your community and planet?”** The curriculum modules will help the students explore this question further throughout the school year, using activities and discussions grounded in the science curriculum standards found in the participating countries. In each videoconference, students will be asked to think about the policies of their own country; whether they agree or disagree with those policies and what they can do to help create the change they want to see in their own community.

Learning Objectives and Learning Outcomes

The overall goal of Connecting Cultures, Exploring Science: *Road to Doha* is to foster global education and inter-cultural collaboration among participating students through the topic of science and technology. The program’s specific learning objectives and learning outcomes include:

Program Goal: Global, Inter-cultural Collaboration Through the topic of Science and Technology	
Learning Objectives	Learning Outcomes
<ul style="list-style-type: none"> To increase secondary students’ knowledge of the science and politics behind climate change, as well as their confidence to lead conversations with peers on these topics; To establish channels of communication and collaboration between young people in North America and Qatar, allowing them to create bonds and relationships across borders and cultures; To promote young people’s participation and contribution to the conversation around climate change. 	<ul style="list-style-type: none"> Students have a well-rounded knowledge of the science and politics of climate change, and be able to actively engage in conversations on climate change Students establish lifelong learning partnerships and build appreciation of cultures and perspectives worldwide Students will be aware of the various debates and perspectives that surround climate change, and be able to contribute knowledgeably to international initiatives and ongoing collaborations on the topic



Scope and Sequence

	MODULE 1: GLOBAL CLIMATE CHANGE	MODULE 2: WATER USE AND ACCESS	MODULE 3: CAUSE AND EFFECT
Driving Question	<i>“How do we, as youth, impact climate change in our communities?”</i>		
Guiding Question	<i>What is global climate change? How does it impact your community and the world?</i>	<i>How is water used in your community? How is access to water affected by climate change?</i>	<i>How does pollution affect the availability of resources such as water, fertile soils and clean air?</i>
Enduring Understanding	Ecosystems are dynamic and subject to change.	All water on Earth is constantly recycled, reunified and reused. All the water used by humans must come from this cycle.	Human activities have an impact on the environment, whether deliberately or inadvertently. Environmental change in one part of the world can impact seemingly distant places and systems.
Suggested Units	Biology/Environmental Science: Ecosystems, Biomes, Chemistry: Physical & Chemical Change	Biology/Environmental Science: Biomes, Water Cycle, Land & Water Use, Cells, Evolution Chemistry: Chemical Change, Periodicity, Environmental chemistry	Biology/Environmental Science: Energy Resources & Consumption, Resource Sustainability, Ecology Chemistry: Oxidation & Reduction, Types of Reactions
Timeframe	October/November 2013	November/December 2013	January/February 2014
Learn	Think, Pair, Share: Climate Change	Climate Change and the Water Cycle	Energy and Waste
	Personal Ecological Footprint	Personal Water Use	Packaging, Processing and Pollution
Act	Community Lens IVC 1: Oct/Nov ____, 2013	Milestone 1: Project Launch IVC 2: Nov/Dec ____, 2013	Milestone 2: Outline & Content IVC 3: Jan/Feb ____, 2014
Reflect	<i>How do changes in one country affect the rest of the planet?</i>	<i>How does water scarcity and the implications of water use or overuse impact countries worldwide?</i>	<i>What are the major pollutants in your and your partner country? What actions can you take to limit these pollutants and their negative impacts?</i>



	MODULE 4: SOCIETY, ETHICS & POLITICS	MODULE 5: ENVIRONMENTAL ACTION
Driving Question	<i>“How do we, as youth, impact climate change in our communities?”</i>	
Guiding Question	<i>How can societies create policies that deal with climate change today and tomorrow?</i>	<i>What role can you play in combating climate change?</i>
Enduring Understanding	Societies create policies that are best for their own water, food and energy security. The global climate is affected by national policies and practices relating to energy use, waste, manufacturing and population control.	As a global citizen, you can create change within your community and the world.
Suggested Units	Biology/Environmental Science: Global Change, Society, Ethics and World Views, Resource Sustainability, Human behavior, Evolution, Ecological Relationships Chemistry: Environmental Chemistry	Biology/Environmental Science: Global Change, Society, Ethics and World Views, Sustainability, Human behavior Scientific Inquiry: Use methods of scientific investigation, Know how scientists work, Process and communicate information Chemistry: Environmental Chemistry
Timeframe	March 2014	April 2014
Learn	Climate Change Challenges	Beyond Fossil Fuels
	International Community and Climate Change	
Act	Milestone 3: Rough Draft IVC 4: April ____, 2014	Milestone 4: Final Product IVC 5: May ____, 2014
Reflect	<i>How can international cooperation work to address climate change?</i>	<i>How do we, as youth, impact climate change in our communities?</i>



Interactive Videoconference Scheduling

Use this page to record the days/times of your interactive videoconferences (IVCs). Please note: a school **may not cancel** an IVC unless extenuating circumstances arise (i.e. extreme weather, security threat).

SAMPLE	
Day	Wednesday
Date	October 17, 2013
Tech Dial-in Time	7:30 AM EST
Conference Start Time	8:00 AM EST

INTERACTIVE VIDEOCONFERENCE #1: GLOBAL CLIMATE CHANGE	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

INTERACTIVE VIDEOCONFERENCE #2: WATER USE AND ACCESS	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

INTERACTIVE VIDEOCONFERENCE #3: CAUSE AND EFFECT	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

INTERACTIVE VIDEOCONFERENCE #4: SOCIETY, ETHICS AND POLITICS	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

INTERACTIVE VIDEOCONFERENCE #5: ENVIRONMENTAL ACTION	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

INTERACTIVE VIDEOCONFERENCE BACKUP A	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

INTERACTIVE VIDEOCONFERENCE BACKUP B	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

INTERACTIVE VIDEOCONFERENCE BACKUP C	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:



Collaborative Project

- Collaborative Project Introduction
- Project Criteria Wheel
- Project Format Options
- Project Team Roles
- Project Challenge Letter
- Project Guide
- Project Feedback Guide



Collaborative Project Introduction

What is a GNG collaborative project?

A GNG collaborative project is a project-based learning activity that challenges students to work together to develop solutions to real-world problems. Within and across classrooms engaged in GNG programs, students collaborate to define a challenge in their local or global communities and develop a project that addresses that issue by promoting positive change and community engagement.

Collaboration is defined as two or more people working together towards a common goal. Collaboration on projects (with peers in class and/or virtually, locally and/or globally) should take place in **at least** one of the following ways:

- Share feedback and reflections on projects
- Share resources for projects
- Co-construct one project with peers

What are the collaborative project's specific objectives?

1. To address Road to Doha driving question, through youth-led investigation of an environmental challenge identified in students' local or global communities;
2. To use cross-cultural dialogue, media, and technology to deepen understanding of this challenge through collaboration;
3. To problem solve and/or raise awareness about issues or needs in the local or global community, and;
4. To engage local and global communities in this challenge by sharing projects and knowledge with wider audiences.

A **driving question (DQ)** provides the purpose for the project and guides its creation. **The Collaborative Project should answer the DQ.**

How will the curriculum support completion of the collaborative project?

Students will be introduced to the collaborative project through a **Challenge Letter** (p. 14), calling all youth to become GLOBAL NOMADS through completion of a project with peers, addressing an issue relevant and meaningful to their local and global community. The Challenge Letter will appear as the first page of the Student Workbook and will set the framework for student participation in a GNG program.

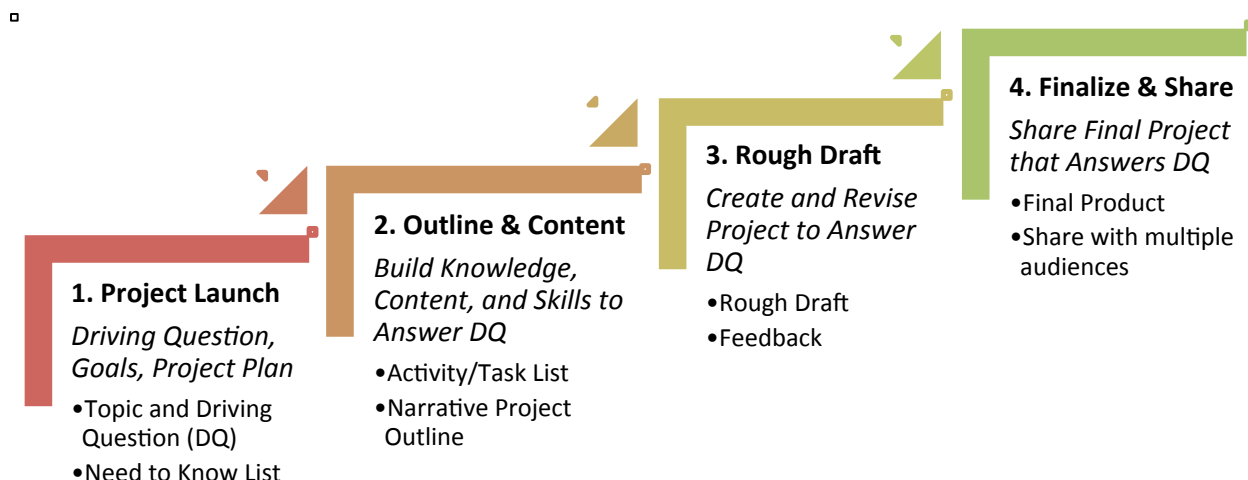
The documents below¹ will support design, planning, and completion of the collaborative project and should be referred to throughout the project. The Challenge Letter, referenced above, also appears within these documents.

Criteria Wheel	p. 11
Project Format Options	p. 12
Project Team Roles	p. 13
Challenge Letter	p. 14
Project Guide	pgs. 15 – 16
Feedback Guide	p. 17

¹ The framing and supporting documents presented in this Collaborative Project Module were based on or adapted from resources of the 2013 Buck Institute of Education, *PBL 101 Workbook*



Four Milestones, or accomplishments, outline the step-by-step process for project completion. An overview of each milestone appears in the chart below, and is elaborated upon fully in each corresponding curricula module. Upon completion of each milestone, students should return to the **Project Guide** (pgs. 15-16) to fill in or update information, as applicable. As part of the collaboration process, students will give and receive feedback to their peers as a key component of each milestone.



The **Online Platform** will serve as the space for project communication, including sharing of feedback, ideas, and resources, between schools or groups. As each milestone is completed, students should post work to the corresponding section of the online platform, for feedback from peers. Once projects are complete, these should be shared with peers on the online platform.

The **Feedback Guide** (p. 17) will guide students in giving and receiving feedback from their peers. **Revision** should take place every time groups receive feedback, adjusting and updating the project guide and project activities as applicable.

□

Revision is when one changes or alters something in light of new ideas, suggestions, or evidence. In the collaborative project, students should revise the Project Guide and Activities every time peer feedback is received.

How long will the project take to complete?

Each curriculum module includes 60 minutes of activity time to begin the preparation for each milestone. However, additional time and student work outside of class may be needed to complete milestones, and will be necessary to complete the project by the final interactive videoconference.

What are the criteria and guidelines for the project?

The **Criteria Wheel** (p. 11) outlines six elements of a strong and successful project that can promote deep community impact. Project completion depends equally on all criteria elements, which work best in tandem to achieve students' objectives and the goals of *Road to Doha*.

The Criteria Wheel can be used as a rubric to perform peer and self-assessment throughout the project.

Criteria Wheel

The Criteria Wheel outlines six elements of a strong and successful project and can be used as a rubric to perform peer and self-assessment throughout the project.



Mobilize	<ul style="list-style-type: none"> Project answers the program's driving question. Project positively engages youth and communities, within and beyond GNG programs and community, in an active way.
Investigate & Analyze	<ul style="list-style-type: none"> Topic is relevant to your local and/or global community. Inquiry deepens your understandings of people, places, and relevant issues worldwide.
Communicate	<ul style="list-style-type: none"> Communication among peers involved in the project occurs throughout the project and in a timely fashion.
Collaborate	<ul style="list-style-type: none"> Collaboration with peers (in class, nationally, or internationally) takes place in at least one of the following ways: <ul style="list-style-type: none"> Share feedback and reflection on projects Share resources for one another's projects Co-construct one project with peers.
Document	<ul style="list-style-type: none"> Project creation and implementation is visually documented by students, for sharing with a wider audience. This could include picture, video, or written text (online or print).
Share	<ul style="list-style-type: none"> Project is shared with other GNG program peers. Project is shared with at least one additional group outside of GNG that is actively impacted by or involved in the project topic.

Connecting Cultures, Exploring Science: Road to Doha
Collaborative Project

Project Format Options

The Project Format Options outlines types of projects across three themes: **Awareness, Advocacy, and Action**. Determine what you and your peers would like to accomplish through this project, and then brainstorm which format option will help you achieve this goal best.

	AWARENESS	ADVOCACY	ACTION
Goal <i>What do you want to accomplish?</i>	Awareness projects inform others about an issue. They expand a community's understanding of a problem, empowering people through knowledge.	Advocacy projects speak out or argue for a specific cause or policy that would address an issue. Advocates target decision-makers in a community who can help change the status quo.	Action projects develop and implement real-world solutions to community problems. They involve direct activities that support or counter a cause.
Sample Driving Questions	What impact does water scarcity have on our future?	How do we, as advocates, change city policies that would reduce water use?	How do we, as citizens, reduce our individual and school water usage?
Project Type	Public Service Announcement (PSA): <i>Widely-shared message that raises awareness or changes public attitude</i> Media Output: Visual arts, performing arts	Campaign: <i>A set of activities that promotes a specific cause, law, or change of behavior, often through media or politics</i> Media Output: Visual arts, performing arts, writing, event	
	Documentary*: <i>Media or art that objectively presents the stories of real-life people or events, often to raise awareness of a specific issue or move people to take action.</i> Media Output: Visual arts, performing arts, writing *Don't forget! Documentaries are not limited to film. They can be radio podcasts, photo/art exhibits, interactive theatre, investigative journalism, and more!	Event: <i>In-person activity that produces a particular product or outcome (voter registration, fundraising)</i> Media Output: Event-based	
	Student Choice: <i>Design and implement your own type of project! Make sure it fits the criteria on pg. ##.</i> Media Output: All!		
Media Output	Visual Arts – Photography, drawing, painting, design, crafts, mural, film, posters Performing Arts – Radio, theatre, film, music, spoken word, dance Writing – Fiction/non-fiction blog, newsletter, journalism, letter-writing, creative writing, social media		

Project Team Roles

Project Team Roles will organize everyone's responsibilities around the project. Be sure every group member has at least one role!

Project Start

Project Completion and Sharing

Group Leader: You make sure all group members stay on task and meet deadlines! You are also responsible for communicating with your partner group and/or GNG and SOLA staff, as needed. As the group leader, you should keep your peers focused and on schedule, making sure your project stays on topic, is action-oriented, and involves positive collaboration, feedback, and reflection with your partner group.

Research Committee: As part of this team, you conduct or lead background research on the chosen topic, which includes finding similar projects for inspiration and comparison. You should share what you learn with the Content Creation Committee to make sure the project is accurate, relevant to your chosen topic, and has the information necessary to make it successful.

Example: In a project to reduce your community's trash output, the research committee might research how much trash the community currently produces, where the trash goes, what current recycling options exist in the area, etc.

Logistics Committee: As part of this team, you make sure that the group has all necessary supplies and materials needed for project and your community event. You will also coordinate any travel needs, event planning and/or any venue reservations required.

Examples: Reserve venue for film screening/exhibition/community event; hire bus or translation services; recruit volunteer to assist with film editing, etc.

Content Creation Committee: As part of this team, you coordinate the creation of content of the project. This doesn't mean you have to create all of the content yourselves; similar to the Research Committee, other group members may be assigned roles in the creation process.

Examples: Storyboard, draft, and collect materials for project, which could be film, photos, posters, letter writing templates, mural, etc.

Documentation Committee: As part of this team, you visually document the project – in its creation and/or completion. You will make sure it can be easily shared with online and in person audiences

Examples: short film, time-lapse photography, etc.

Outreach Committee: As part of this team, you raise awareness about your project: engage in PR, social media, and or press media campaigns. You should also plan a community event, in coordination with the Logistics Committee.

Challenge Letter

WHO ARE GLOBAL NOMADS?

Global Nomads fundamentally believe that all people, in all countries, from all cultures, are good. It's the misconceptions we're all raised with, taught or learned, that blind us to be otherwise. **Global Nomads** seek out these misconceptions and discuss them openly, honestly, and more importantly, face-to-face. **Global Nomads** are citizens of the world.

Calling All Youth:

Since 1998, Global Nomads Group has been connecting young people like you with their peers worldwide. **Global Nomads** – young people who embrace cross-cultural dialogue and celebrate both similarity and difference – are positively influencing their communities in over 50 countries, across all seven continents. Today, we ask you to join them as part of the Connecting Cultures, Exploring Science: *Road to Doha (R2D)* program.

As a **Global Nomad** in *R2D*, we challenge you to bring global voices into your local conversations. By connecting and collaborating with peers in North America, and Qatar we challenge you to answer: **“How do we, as youth, impact climate change in our communities?”**

As a **Global Nomad**, you will:

- **Collaborate** with your peers to identify an issue that you want to **change** in your community.
- Use arts and media to **create** a real-world solution to this issue.
- **Share** the project locally and globally.

By taking action, you can become a Global Nomad, a citizen of the world.

Are you ready for the challenge? Through discussion with your peers, you will identify an environmental issue that impacts you, as a young person, in your local or global community and that you want to positively influence. Together with your peers, you will investigate, analyze, and learn more about this issue in order to develop a project that implements a real-world solution in your local or global community.

Throughout the program, you'll use the following project documents to guide your progress:

- **Four Milestones**, or steps, will help you plan and implement your project. Curriculum activities and a **Project Guide** will lead you through completion of each milestone.
- The **Criteria Wheel** will guide you in making sure your project includes all of the elements of a successful and collaborative effort with your peers!
- In the **Project Format Options** guide, we've outlined **Project Types** across three themes: **Awareness, Advocacy, and Action**. Determine what you and your peers would like to accomplish through this project, and then brainstorm which format option will help you achieve this goal best.
- To streamline collaboration, review the **Project Team Roles** and make sure that everyone in your group has at least one role and responsibility for the project.

Be daring and creative, and don't be afraid to take risks. This is your opportunity to make a difference in the world in which you live. This is your opportunity to become a **Global Nomad**.

- **Global Nomads Group Team**

Project Guide

As a **living document**, the **Project Guide** will lead the development of your project. Upon completion of each **milestone**, refer to this guide and fill in – **or revise** – the relevant information.

A. Project Overview

Refer to Format Options, page 12, for additional guidance.

Topic: _____

Title: _____

Goal: ☐ Awareness ☐ Advocacy ☐ Action

Driving Question (DQ): _____

Objective: Based on your DQ and goal, what do you hope to achieve with your project?

Project Type: ☐ Campaign ☐ Documentary ☐ Event ☐ Public Service Announcement

Media Output: ☐ Visual Arts ☐ Performing Arts ☐ Writing ☐ Event-Based

Specific output (for example: radio piece, blog, photo story): _____

Calendar: If you are engaging in Interactive Videoconferences (IVCs), milestones should be completed and shared online one week before the related IVC, so you and your peers have time to give and receive feedback. You may have more than one milestone per IVC.

Milestone	IVC Number and Date <i>Ex: IVC 3, April 2</i>	Milestone Due Date <i>1 week before IVC (Ex: March 25)</i>
1 – Project Launch		
2 – Outline & Content		
3 – Rough Draft		
4 – Finalize & Share		

B. Target Audience

Who is the target audience? (ex: peers, teachers, community, family, country)

Why is this an important target audience?

How will we share our project with our audience? (ex: In local events? Online?)

Connecting Cultures, Exploring Science: Road to Doha Collaborative Project

C. Project Team Roles

Refer to Project Team Roles, page 13, for additional guidance

Student Roles: *Record your group's roles here.*

Group Leader: _____

Research Committee: _____

Logistics Committee: _____

Content Committee: _____

Documentation Committee: _____

Outreach Committee: _____

Partner School Role (if applicable): *What do you need from your partner school?*

D. Activity and Materials Chart

Record the step-by-step process for completing your project in the chart below, taking into account all student roles. Specify the materials you need, deadline for each step (keep the milestone deadlines in mind!), and committee responsible for each activity.

Activity (Step)	Materials/Resources Needed	Deadline	School Responsible	Committee Responsible
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				



Feedback Guide²

Use the categories below to provide feedback on your group or partner's project or milestone. Remember to give constructive feedback that is respectful and includes specific ideas for growth, instead of general praise or criticism.

I hear/see...

What do you observe? How does the project make you feel or think? Does it motivate you to action?

I want more of...

What do you want to see expanded or enhanced? What worked well and compelled you to think or act a certain way?

I wonder...

What questions do you still have? What could strengthen the project? How could it more specifically answer the Driving Question?

² Adapted from: Buck Institute of Education. *PBL 101 Workbook*. California: Unicorn Printing Specialists, 2013.



Program Curriculum



Module 1: Global Climate Change

Overview

In **Learn**, students review the greenhouse effect and greenhouse gases as the causes of global climate change. Students calculate their personal ecological footprint to explore how their personal actions impact the larger world.

In **Act**, students identify the impacts of global climate change on their local community and environment and begin the process of cultural exchange with their peers. Students will identify and share significant aspects of their local ecosystems, cultures, and customs with their partners and how they may be impacted by climate change.

Background

The Earth's climate is naturally dynamic and variable. However, climate is dependent on interconnected micro and macro **ecosystems** and drastic change within an ecosystem can cause destabilization of that ecosystem. Change within an ecosystem can be brought on by something naturally occurring or can be the result of a human activity like development. We now understand that human activity can cause ecosystem imbalances and disturbances, which can lead to **global climate change**.

The **greenhouse effect**, naturally insulating our planet, has been intensified by our unsustainable usage of energy and our environment. Carbon dioxide, a **greenhouse gas**, cycles through the atmosphere, the hydrosphere (oceans, rivers), the biosphere (living organisms, including humans) and the geosphere (rocks, fossil fuels). However, carbon has increased dramatically in our atmosphere, increasing the rate of global climate change as well.

Human activities like our unsustainable use of energy, fossil fuels, increasing CO₂, deforestation, and growing populations are all factors behind global climate change. The consequences of global climate change includes more intensive storms, climate change related refugees and migrations, sea level rise, floods and food insecurity. These impacts of global climate change are not evenly spread out and the effects are based upon the local climate and topography of an area.

Module Objectives

- Learn about factors that cause global climate change;
- Understand the greenhouse effect and greenhouse gases;
- Take part in a cross-cultural collaboration, sharing thoughts regarding changes affecting their own communities and ecosystems and the world.

	Activity	Page	Estimated Time
LEARN	Think, Pair, Share: Climate Change	20-22	45 minutes
	Personal Ecological Footprint (HW)	23-25	30 minutes
ACT	Community Lens	26-27	60 minutes
	Interactive Videoconference (IVC) #1	28-29	30 minutes preparation 60 minute IVC + 30 min. dial-in
REFLECT	Reflect	30	15 minutes



LEARN

Think, Pair, Share: Climate Change	
TIME: 45 minutes	MATERIALS: Paper, Pencils, “Heat-Trapping Gasses in the Atmosphere” (p 20), “The Greenhouse Effect” (p 21)
KEY VOCABULARY <i>Climate change, Greenhouse effect, Carbon Cycle, Adaptations</i>	
READINGS & ADDITIONAL RESOURCES “The Carbon Cycle”. http://earthobservatory.nasa.gov/Features/CarbonCycle/carbon_cycle2001.pdf Video “CO2 in the Ice Core” http://earththeoperatorsmanual.com/segment/5	
OVERVIEW Students learn about climate change, greenhouse effect and the carbon cycle through readings. Students practice public speaking skills and active listening by sharing information with a partner and also gaining information from a partner who read a different article.	
INSTRUCTIONS <ol style="list-style-type: none"> Think: Divide the class into two groups. Assign each group one of the two attached articles to read: “Heat- Trapping Gases” or “The Greenhouse Effect.” Throughout the reading students take notes on the article and associated image to explain the information to a partner. Notes should answer: <ul style="list-style-type: none"> How do greenhouse gases impact climate change? How do carbon and temperature correlate?; How do human activities impact climate change? What are these activities? Pair: Pair students so that one person has read each article. Students share their summary and ask questions about the other article to their partner until they feel comfortable with the material. Share: Regroup the class. Invite at least two students to share information in front of the class about the article that their partner read. This is great presenting and speaking for the IVC. Review: As a class go over impressions of the reading and pose the questions: <ul style="list-style-type: none"> How do temperatures and carbon dioxide increase correlate? How do greenhouse gases increase the rate of global climate change? How do carbon and other greenhouse gases circulate in the atmosphere? What role does the greenhouse effect play in making Earth habitable? What are several greenhouse gases? Brainstorm: Students brainstorm and create two lists. <ul style="list-style-type: none"> List 1: What activities release greenhouse into the atmosphere? List 2: What actions can I personally take to limit emissions of greenhouse gases? Homework: Prior to the first IVC, students calculate their Personal Ecological Footprint using the worksheet on pages 23-25. 	

HEAT TRAPPING GASES IN THE ATMOSPHERE³⁴

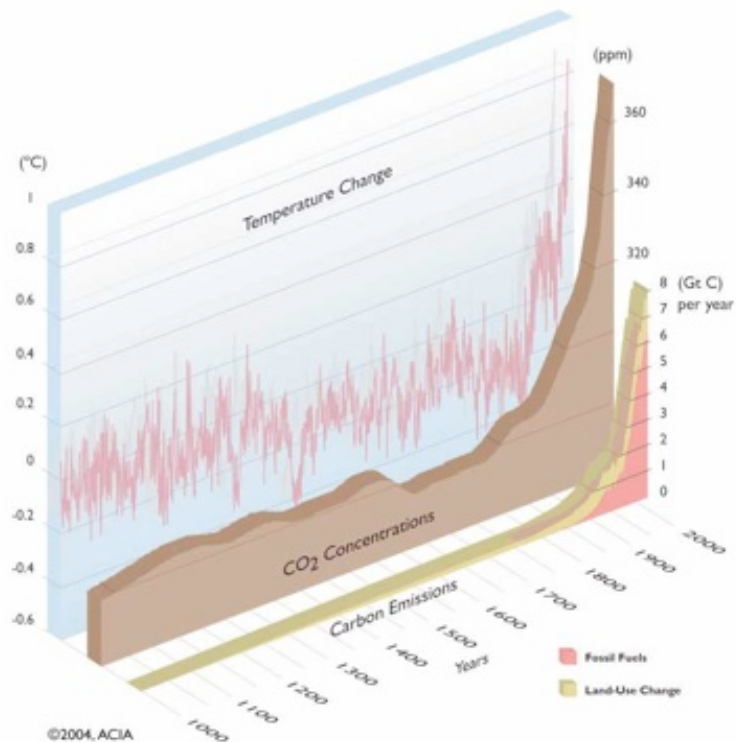
To study climate change, we need to understand certain gases in Earth's atmosphere that impact climate change. These gases act like a blanket in the atmosphere trapping heat and warming the planet. Scientists have called these gases "greenhouse" gases, because akin to an actual greenhouse made of glass and used to grow plants when it is too cold outside, these gases trap heat and help regulate the temperature on earth. When the amount of greenhouse gases in the atmosphere rises, temperatures on Earth rise as well, causing a change in the climate.

Some greenhouse gases occur naturally and some are man-made. Water vapor is a greenhouse gas that occurs naturally, as a result of Earth's water cycle. Other greenhouse gases such as chlorofluorocarbons (CFCs) are created entirely by humans. Many greenhouse gases that occur naturally are also released through human activities. For example, carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4) are all cycled through Earth's atmosphere naturally. Human activities that burn fossil fuels such as oil or gas, increase the amounts of greenhouse gases in Earth's atmosphere, affecting the balance of natural cycles.

Some gases are more effective at trapping heat than others and stay in the atmosphere longer than others. The better a gas is at trapping heat and the longer it stays in the atmosphere, the more potential it has for aiding global warming.

Scientists who study climate change often focus on CO_2 because the amount in the atmosphere is much greater than any other greenhouse gas produced by human activities. CO_2 accounts for 74% of global greenhouse gas emissions from human activities and can remain in the atmosphere for up to 200 years.

The concentration of gases in the atmosphere is measured in parts per million (ppm), parts per billion (ppb) or parts per trillion (ppt). For reference, concentrations of carbon dioxide are currently about 388 ppm and concentrations of methane are about 1800 ppb.⁵



³ Adapted from: "Global Warming Lesson Plan 6-12 Lesson Plan," Will Steger Foundation, 2010, <http://willstegerfoundation.org/curricula-resources/grades-6-12>

⁴ Adapted from: "Climate Change: Connections and Solutions," *Facing the Future*, 2007, <https://www.facingthefuture.org/K12Curriculum/BuyCurriculum/tabid/550/CategoryID/16/List/1/Level/a/ProductID/15/Default.aspx-.UiDQDmQ4W1M>

⁵ To see the most up to date concentrations of carbon dioxide www.co2now.org

THE GREENHOUSE EFFECT⁶⁷

You have most likely seen or heard the term climate change in many places- it seems as if everyone is talking about it. But what exactly is climate change, and how does it relate to our lives?

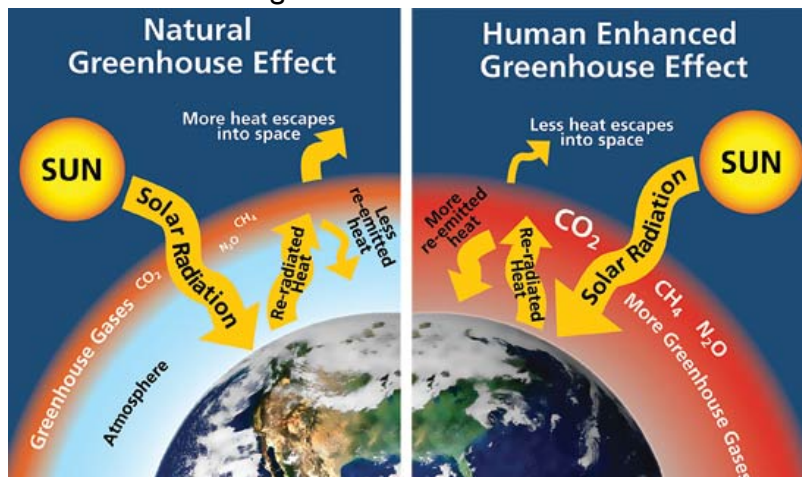
Climate change refers to any change in climate over time, whether caused by natural factors (such as volcanic eruptions) or human activities. Climate is average weather (including temperature, precipitation and wind) over a period of time (from months to millions of years). When we examine weather over many years, we can see climate patterns.

To study climate change, we need to understand Earth's greenhouse effect. The greenhouse effect is important because it makes conditions on Earth warm enough for many species to survive. Have you ever noticed that if, on a sunny day, a car has been parked in the sun with the windows rolled up the temperature is much higher inside of the car than it is outside? Or have you ever gone inside a greenhouse where plants are grown and noticed that the temperature is much higher inside than it is outside? If you have, then you've experienced a greenhouse effect.

The earth has gases within its atmosphere that, act like the layer of glass on a greenhouse and trap heat that would otherwise be lost to space. Energy, in the form of light and heat, comes from the sun. That energy is either reflected by the earth or absorbed and then re-radiated back towards space. When this out-going energy hits the layer of heat-trapping gases, some of it passes through back out into space, but some of it gets trapped and re-reflected back to earth.

The atmosphere and this heat-trapping effect make life as we know it possible on earth. Without the heat-trapping gases in our atmosphere, temperatures on earth would average around 0° F (-18° C) and the surface of the earth would be frozen. The climate change issue that we are facing now is a result of human enhanced greenhouse effect.

Image: The Greenhouse Effect



Natural Greenhouse Effect:

This shows the naturally occurring phenomenon in which gases in our atmosphere act like a blanket to retain some of earth's heat.

Human Enhanced Greenhouse Effect:

This shows how the increased greenhouse gases in our atmosphere as a result of human activities, leads to the increased retention of

⁶ Ibid.

⁷ Ibid.



Personal Ecological Footprint⁸

Complete the following chart based on a typical day in your home. Add the points in each category to obtain a subtotal, and transfer each subtotal to the summary chart. Use the grand total to calculate your ecological footprint.

Your ecological footprint is a measure of the amount of renewable and nonrenewable resources that are used by your activities. Ecologically productive land is required to support everything that you eat or use, and also to absorb the wastes you create.

Stuff	My Score	Transportation	My Score
1. All today's garbage could fit into a: _____ a. Shoebox (20) b. Small garbage can (60) c. Kitchen Garbage can (200) d. No garbage created today! (-50)		1. I travel to school by: _____ a. Foot or bike (0) b. Public transit/ school bus (30) c. Private vehicle; carpool (100) d. Private vehicle; 1 student (200)	
1. I recycle all paper, cans, glass and plastic: _____ (-100)		2. Our vehicle's fuel efficiency is: _____ a. More than 30 mpg or 12.7 km/l (-50) b. 24-30 mpg or 10.2-12.7 km/l (50) c. 17-23 mpg or 7.2-9.8 km/l (100) d. Less than 17 mpg or 7.2 km/l (200)	
2. I reuse items rather than throw them out: _____ (-20)		3. The time I spend in vehicles is: _____ a. No time (0) b. Less than half an hour (40) c. Half an hour to 1 hour (100) d. More than 1 hour (200)	
3. I repair items rather than throw them out: _____ (-20)		4. How big is the car in which I travel: _____ a. No car (-20) b. Small (50) c. Medium (100) d. Large (200)	
5. I avoid disposable items as often as possible: a. Yes (-50) _____ b. No (60)		5. Number of cars in our driveway: _____ a. No car (-20) b. Less than 1 car per driver (0) c. One car per driver (50) d. More than 1 car per driver (100) e. More than 2 cars per driver (200)	
1. I use rechargeable batteries (-30): _____		6. Number of flights I take per year: _____ a. 0 (0) b. 1-2 (200) c. More than 2 (400)	
2. In my home we have X number of electronics? (computer, tv, stereo, dvd, Play Station, etc.) _____ a. 0-5 (25) b. 5-10 (75) c. 10-15 (100) d. More than 15 (200)			
8. How much equipment is needed for typical activities? _____ a. None (0) b. Very Little (20) c. Some (60) d. A lot (80)			
Stuff Subtotal: _____		Transportation Subtotal: _____	

⁸ Adapted from: "Ecological Footprint," *Institute for Sustainable Energy at Eastern Connecticut State University*, <http://www.easternct.edu/sustainenergy/education/documents/EcologicalFootprintLessonPlan.pdf>



Food	My Score	Shelter	My Score
1. I eat: _____		1. My house is: _____	
a. Meat more than once per day (600)		a. Single house on large lot (suburbs) (50)	
b. Meat once per day (400)		b. Single house on small lot (city) (0)	
c. Meat several times a week (300)		c. Townhouse/attached house (0)	
d. Vegetarian (no meat or fish) (200)		d. Apartment (-50)	
e. Vegan (no animal products including: meat, fish, eggs, dairy) (150)		2. Divide the number of rooms, no baths, by the number of people living at home: _____	
2. X of my food is grown locally or is organic: _____		a. 1 room per person or fewer (-50)	
a. All (0)		b. 1-2 rooms per person (0)	
b. Some (30)		c. 2-3 rooms per person (100)	
c. None (60)		d. More than 3 rooms per person (200)	
3. I compost my fruit/vegetable scraps _____		3. We own a second, or vacation home that is often empty: _____	
a. Yes (-20)		a. No (0)	
b. No (60)		b. We own/use it with others (200)	
4. X of my food is processed. _____		c. Yes (400)	
a. All (100)		Shelter Subtotal: _____	
b. Some (30)			
c. None (0)		Clothing	My Score
5. X of my food has packaging. _____		1. I change my outfit every day and put it in the laundry: (80) _____	
a. All (100)		2. I am wearing clothes that have been mended or fixed: (-20) _____	
b. Some (30)		3. One fourth of my clothes are purchased new each year: (200) _____	
c. None (0)		4. Most of my clothes are handmade or secondhand: (-20) _____	
6. I waste: _____		5. I give the local thrift store clothes that I no longer wear: _____	
a. None of my food (0)		6. I never wear X% of the clothes in my closet: _____	
b. One fourth of my food (25)		a. Less than 25% (25)	
c. One third of my food (50)		b. 50% (50)	
d. Half of my food (100)		c. 75% (75)	
Food Subtotal: _____		d. More than 75% (100)	
		7. I buy X new pairs of shoes every year: _____	
		a. (0)	
		b. 2-3 (20)	
		c. 4-6 (60)	
		d. 7 or more (90)	
		Clothing Subtotal: _____	



Energy Use	My Score
1. In cold months, our house temperature is: _____	
a. Under 15°C (59°F) (-20)	
b. 15 to 18°C (59 to 64°F) (50)	
c. 19 to 22°C (66-71°F) (100)	
d. 22°C (71°F) or more (150)	
2. We dry clothes outdoors/on an indoor rack: _____	
a. Always (-50)	
b. Sometimes (20)	
c. Never (50)	
3. We use an energy-efficient refrigerator: _____	
a. Yes (-50)	
b. No (50)	
4. We have a second refrigerator/freezer: _____	
a. Yes (100)	
b. No (50)	
5. We use 5 or more compact fluorescent light bulbs: _____	
a. Yes (-50)	
b. No (100)	
6. I turn off lights, computer and television when not in use: _____	
a. Yes (0)	
b. No (50)	
7. To cool off, I use: _____	
a. Air conditioning: Car (50)	
b. Air conditioning: Home (100)	
c. Electric Fan (-10)	
d. Nothing (-50)	
8. My clothes washer is a: _____	
a. Top load (100)	
b. Front Load (50)	
c. Laundromat (25)	
Energy Use Subtotal: _____	
<p>Are you surprised by how many “Earths” or acres it would take to sustain you?</p> <p>What activities surprised you as using a lot of resources?</p>	

Water Use	My Score																		
1. My shower (or bath) is: _____																			
a. No shower/no bath (0)																			
b. Short shower 3-4 times a week (25)																			
c. Short shower once a day (50)																			
d. Long shower once a day (70)																			
e. More than one shower per day (90)																			
3. I flush the toilet: _____																			
a. Every time I use it (40)																			
b. Sometimes (20)																			
4. When I brush my teeth: _____																			
a. I turn the water off (10)																			
b. I let the water run (40)																			
5. We use water- saving toilets. (-20) _____																			
6. We use low-flow showerheads. (-20) _____																			
Water Use Subtotal _____																			
<p>Summary</p> <p>Transfer your subtotals from each section and add them together. Divide the total by 300.</p> <table style="width: 100%;"> <tr> <td style="width: 60%;">Water Use</td> <td>_____</td> </tr> <tr> <td>Food</td> <td>_____</td> </tr> <tr> <td>Transportation</td> <td>_____</td> </tr> <tr> <td>Shelter</td> <td>_____</td> </tr> <tr> <td>Energy Use</td> <td>_____</td> </tr> <tr> <td>Clothing</td> <td>_____</td> </tr> <tr> <td>Stuff</td> <td>_____</td> </tr> <tr> <td style="text-align: right;">Total</td> <td>_____</td> </tr> <tr> <td style="text-align: right;">/ 300 =</td> <td>_____ Earths</td> </tr> </table> <p>If everyone lived like I do we would need _____ Earths to sustain the people of the world.</p> <p>Multiplying the number of Earths needed by 4.7 gives the number of acres used to support my lifestyle= _____ acres.</p> <p>Worldwide there are 4.7 biologically productive acres available per person, not including other plants’ and animals’ needs.</p> <p>Compare your total with the total from the average in your country and other countries at</p> <p>http://storymaps.esri.com//globalfootprint/</p>		Water Use	_____	Food	_____	Transportation	_____	Shelter	_____	Energy Use	_____	Clothing	_____	Stuff	_____	Total	_____	/ 300 =	_____ Earths
Water Use	_____																		
Food	_____																		
Transportation	_____																		
Shelter	_____																		
Energy Use	_____																		
Clothing	_____																		
Stuff	_____																		
Total	_____																		
/ 300 =	_____ Earths																		

ACT

Community Lens

TIME

60 minutes

MATERIALS

Video camera, digital camera, computer, Internet, *"Impacts of Global Climate Change"* (p 27)

OVERVIEW

Students introduce themselves and their school/community/cultures to their peers through the creation of a short video or picture slideshow. The video/picture slideshow will be showcased during the IVC and serve as a starting point for students to discuss local ecosystems, cultures, and interests, as well as relevant environmental issues, with their peers.

INSTRUCTIONS

1. **Brainstorm and Investigate:** Lead students in a brainstorming exercise to identify various local ecosystems and environments they want to showcase to their peers.

2. **Prepare:** Prior to the next class students should take/find photos that visually represent the local environment. Students should begin to hypothesize about potential climate change impacts on these environments.

3. Students use the *"Impacts of Global Climate Change"* (p 27) to identify one or two potential impacts each picture may be vulnerable to as a result of global climate change.
⁹Each student should select two photos that best represent their environment and the impacts or potential impacts of climate change - one that might relate to the community members' interview.

4. Students write a descriptive *sentence* that describes the image, its importance in their life and how it relates to global climate change.

5. **Create:** As a class, create a video/ picture slideshow of pictures highlighting the different local environments and ecosystems, accompanying descriptions and climate change vulnerabilities.

6. **Share:** Upload the class' video/picture slideshow two photos, accompanying descriptions and climate change vulnerabilities on c2c.

7. **View:** Students choose three student images from their partner school and comment on platform to one of the following: what they like about the image; if they can relate to the image in their own community; how is the image different from their own images; whether the image is surprising.

EXPAND YOUR UNDERSTANDING

Interview Your Community

Students should identify one adult community member (parent, grandparent, teacher, etc.) to interview in order to better understand the changes in their environment over time. Ask the following questions:

- What was the local climate and ecosystem like when you were growing up?
- What were the living (animals, plants) and non-living features of your environment?
- How have these features changed over time?
- What environmental changes have you observed?



IMPACTS OF GLOBAL CLIMATE CHANGE ¹⁰
<p>Increasing Temperatures</p> <p>The global average temperature is predicted to rise between approximately 2 to 10° by 2100. However, these temperature increases will not occur equally, as the center of continents will be warmed more rapidly than coastal regions. Also, higher latitudes (the Arctic) are predicted to warm more rapidly than lower latitudes (the Tropics). Rising temperatures will impact both flora and fauna (plants and animals), and directly impact human life-styles.</p>
<p>Changes in Precipitation</p> <p>Precipitation patterns are projected to shift dramatically with some areas predicted to receive more and some less. Higher latitudes (closer to the poles) are predicted to see an increase in precipitation while lower latitudes (closer to the equator) are predicted to see less. Extreme precipitation events are predicted in the form of extreme droughts, floods, and erosion.</p>
<p>Increasing Evaporation</p> <p>Although in some areas there may be an increase in overall precipitation, the rate of evaporation will increase due to the rise in temperature. The areas most likely to be impacted are the interior of continents.</p>
<p>Warmer Oceans</p> <p>The ocean has already seen an increase in temperature and is predicted to continue to rise impacting both marine ecosystems and the likelihood of extreme hurricanes. Hurricanes receive their energy from heat energy that is stored in the ocean. As more heat energy accumulates in the oceans, hurricanes are predicted to become stronger and more intense.</p>
<p>Less Severe and Shorter Winters</p> <p>With increasing overall temperatures, most people will see shortened and less severe winters. In areas with traditionally cold winters, the hard frosts kill off insect pests and the accumulated snowmelts during the spring allow for a recharge of both surface and groundwater. Warmer winters will allow pests to survive and threaten local ecosystems. Less snow-pack that melts earlier would mean that water may be less available during the growing season (spring and summer) when plants need it most.</p>
<p>Disease and Human Health</p> <p>Disease carriers, like mosquitos and ticks, are predicted to expand their ranges as warmer winters will allow them to survive in once colder climates. The potential for waterborne diseases also increases as disease risk rises with decreased water and air quality.</p>
<p>Rising Sea Levels</p> <p>The sea level is predicted to rise anywhere from 4 inches (10 cm) to several yards/meters because of thermal ocean expansion and melting glaciers and icecaps. Low-lying coastal areas, deltas and small islands are at risk for flooding, erosion and in extreme cases evacuation.¹¹</p>

¹⁰ Adapted from: "Global Warming Lesson Plan 6-12 Lesson Plan," Will Steger Foundation, 2010, <http://willstegerfoundation.org/curricula-resources/grades-6-12>



IVC #1 Preparation and Outline

TIME

IVC Outline Preparation– 30 minutes (before IVC)

IVC #1 – 60 minutes

MATERIALS

IVC #1 Outline

OVERVIEW

The outline below will be used as a guide for discussion during IVC #1. Students review and complete this outline prior to IVC #1.

INTERACTIVE VIDEOCONFERENCE #1: Global Climate Change

Day

Date

Tech Dial-in Time

____:____

Conference Start Time

____:____

1. Introduction to *Road to Doha* (5 minutes)

GNG facilitator introduces all participating students to the *Road to Doha* program and the program's driving question: ***How do we, as youth, impact climate change in our communities?***. One representative from each school introduces him/herself and their classmates to their partner school.

- Name of Class Representative:
- Number of students participating in IVC #1:
- Local weather and temperature (in degrees Celsius and Fahrenheit):
- Interesting background about your school or community:

2. LEARN: Global Climate Change and Personal Ecological Footprint (20 minutes) –

Students share and compare their ecological footprint. One week prior to the IVC, they will post ecological footprint and view partner's results on C2C. They should prepare to present their findings and provide comments on peer results. <http://storymaps.esri.com/globalfootprint/>. Record three questions to ask your partner school regarding their Footprint.

Select four representatives. Three will explain their ecological footprint, and one will explain how they might reduce their ecological footprint.

- Name of Class Representative;
- Name of Class Representative;
- Name of Class Representative:
- Name of Class Representative:

After viewing the ecological footprint data posted by your partner school, record three questions or comments to ask during the IVC.

-
-
-



- 3. ACT: Community Lens (20 minutes)** - Each group introduces their school, local environment and potential climate change impacts to their peers through the presentation of their personal ecosystem pictures. One week before the IVC, post your work and view your partner's work on the online platform. Prepare to present your pictures and provide comments on the work of your peers.

Select three representatives to share their descriptive sentence about their personal ecosystem and climate change.
<ul style="list-style-type: none"> ➤ Name of Class Representative: ➤ Name of Class Representative: ➤ Name of Class Representative:
<p>After viewing pictures posted by your partner school, record 3 questions to ask during the IVC.</p> <ul style="list-style-type: none"> ➤ ➤ ➤

4. 60-Second Showcase! (10 minutes)

In each IVC, students will have the opportunity to share more about their personality through showcasing personal talents or interests for their peers. Students are encouraged to participate only once, until all classmates have shared with their peers.

60-Second Showcase! can include: playing a musical instrument, singing, dancing, reciting poetry, exhibiting art (paint, sculpture, etc.); showing any equipment, pictures or medals associated with a sports hobby; sharing any dress or dance associated with a custom or holiday; or explaining a family heirloom or other artifact of significance.

Encourage students to keep their presentations very visual (as non-verbal as possible),. Presentation of the talent ***should not exceed 60 seconds***. Please be sure that students have all required materials to showcase their talent.

Select three student representatives to share a personal interest or talent for their peers in this IVC.
<ul style="list-style-type: none"> ➤ Name of Representative: ➤ Name of Representative: ➤ Name of Representative:

5. Conclusion (5 minutes)



REFLECT

IVC #1 Debriefing Conversation

TIME: 15 minutes (*Either immediately following or shortly after IVC meeting*)

MATERIALS Pen, paper, internet access to online platform

OVERVIEW

Following each IVC, educators are encouraged to engage their students in a short reflective conversation on the module topic, the module activities, and their IVC experience.

INSTRUCTIONS

Use the suggested reflection questions below to guide a conversation with your class.

1. REFLECT on your Conversation:

- By preparing the video or picture slide show about your school/community, what did you realize/learn about your own environment?
- Through engaging with your peers in real time dialogue, what did you learn about their environment? How does it differ from your own?
- How will climate change impact your peers' environment similarly/differently than your own?
- Of the topics covered in the IVC, which would you like to discuss further?
- What questions do you have for the next IVC?

2. CONNECT on C2C:

- On C2C, share your favorite revelation about your partner country peers and their personal ecosystems.
- On C2C, post remaining questions you have for your peers. Make sure to check back and answer questions from your peers.

EDUCATOR FEEDBACK SURVEY:

Following each IVC, educators are encouraged to complete the "Educator Feedback Survey." The survey should not take more than 10 minutes to complete, and will be e-mailed directly to educators immediately following the IVC.



Module 2: Water Use and Access

Overview

In **Learn**, students participate in a demonstration to understand how much water is available on earth. Through an analysis of a diagram and research water use and access in their partner school's country they understand the effects of climate change on the water cycle and what this might mean for our planet. Students use their knowledge as they record, outside of class, water usage data for one week.

In **Act**, students are introduced to the **collaborative project**. They identify an environmental issue in their local and global community, which they would like to address through a real-world solution in the form of a project, and take the first steps towards project planning and creation. Students use the Community Lens (Module 1). **Milestone One: Project Launch**, should be completed by the conclusion of this module.

Background

The water cycle renews fresh water, one of the most important resources for life on earth. Water is needed for food production, economic development and human survival. Climate change is predicted to have a range of impacts on water resources. Variation in temperature and rainfall may affect water availability, increase the frequency and severity of floods and droughts, and disrupt ecosystems that maintain water quality.¹² By 2023, 1800 million people will be living in countries or regions with absolute water scarcity, and two-thirds of the world pollution could be under stress conditions.¹³

Throughout the world, underwater aquifers that take millennia to fill have been depleted by the rapid growth of megacities with surging populations. Many countries and regions are now satisfying the demand for water by withdrawing **groundwater** faster than it is replenished, thereby potentially depleting their supply for future generations. This type of mismanagement can lead to major disruptions in the natural **water cycle**.

Creating a sustainable future will depend on learning how to effectively manage water resources. We must understand the capacities and limitations of the natural water cycle, the consequences of overdrawing water resources and how to **conserve** water resources that are still available.

Module Objectives

- Gain a greater understanding of the water cycle;
- Describe water use and conservation in local communities;
- Use higher-order thinking skills to debate water conservation policies and solutions.
- Collaborate with peers within your class and in your partner school to complete Milestone One: Project Launch

	Activity	Page	Estimated Time
LEARN	Understanding Climate Change and the Water Cycle	32	30 minutes
	Personal Water Use	33-35	40 minutes
ACT	Milestone 1: Project Launch	37	60 minutes in class planning 45 - 60 minutes additional preparation (outside of class)
	Interactive Videoconference (IVC) #2	42-43	30 minutes preparation 60 minute IVC + 30 min. dial-in
REFLECT	Debriefing Conversation	44	15 minutes

¹³ Food and Agriculture Organization of the United Nations (FAO) and UN-Water



LEARN

Understanding Climate Change and the Water Cycle¹⁴

TIME: 30 minutes

MATERIALS: 1 L water, 5 clear cups

KEY VOCABULARY
Conservation; Water cycle; Desalinization; Groundwater; Aquifers
OVERVIEW

Climate change and human activities are affecting the way fresh water is distributed on Earth. In this lesson, students examine the effects of climate change on the water cycle and what this might mean for our planet. Students should have a general knowledge of the water cycle before beginning this lesson.

INSTRUCTIONS

1. **Discuss/ Assess Knowledge:** Students draw a picture of the water cycle. Review the cycle. Emphasize the fact that all water on Earth is recycled and used again and again. All water that is on Earth is all the water that has and ever been on Earth.
2. **Activity:**
 - a. Show the class a container filled with 1 Liter (L) of water. This water represents all the water on earth stored as: ocean, groundwater, rivers, ice caps/glaciers, freshwater lakes and swamps.
 - b. Split the class into 6 groups. Each group chooses one source of water to provide for all of their needs. Each group predicts how much water they will receive of the 1 L.
 - c. Distribute clear cups with the specified amount of water to each group one by one. As you hand the cup to the group tell them how much water it is and have them record the amount on the board: *ice-* 20.6 mL, *groundwater-* 9.0 mL, *lakes-* 0.08 mL, *swamps-* 0.01 mL (5 drops), *rivers-* 0.002 mL (1 drop).
 - d. The last group receives the remainder of the water: *ocean-* 960 mL. Congratulate this group on receiving the most water, BUT before you hand it to them, dump a generous amount of salt in the water. Although the oceans contain most of the planet's water, that water is too salty to use without desalinating it. Desalination is a process that can remove the salt and make the water drinkable or useful for plants, but it is very expensive and energy intensive.
 - e. Refer back to the numbers written on the board. Point out that, while there is a large amount of water on the planet, only 3% is fresh water. The limited amount of fresh water must support a growing population of humans in a changing climate as well as support plant and animal life and agriculture.
 - f. Each group decides how to use their water but must first decide how to divide it among the group members. Groups discuss ho to accommodate the water needs of plants and animals in addition to humans.
 - g. If time permits, extend the discussion to consider how some groups have more water than others. Is this fair? What could be done about it? Extend the conversation to discuss how water sources are not distributed equitably throughout the world.
3. **Conclusion:** Because of the limited amount of fresh, drinkable water is an extremely limited resource on Earth it is important to conserve water.

¹⁴ Adapted from: Anytime Lesson Plan: "Earth's Water: A Drop in Your Cup," *California Academy of Sciences*, <http://www.calacademy.org/teachers/resources/lessons/earths-water-a-drop-in-your-cup/>



Personal Water Use	
TIME 1 week of data collection (outside of class); 1 class period to discuss	MATERIALS “Personal Water Use Chart” (p 35), “Projected climatic changes to the hydrologic cycle” (p 36)
OVERVIEW Students estimate and record their water usage throughout the course of a typical week. Students should keep in mind their water flow rate to estimate their measurement. This requires measurements outside of the classroom.	
INSTRUCTIONS <ol style="list-style-type: none"> Activity: Look at the diagram of “Projected climatic changes to the hydrologic cycle” (p 36) Students should identify these projected changes and answer questions: <ul style="list-style-type: none"> ➤ How can climate change affect the water cycle? ➤ How can climate change affect the amount of water people can access for drinking water? Students use the provided resources and at least one additional article to identify the way that drinking water is accessed and used in their partner country. <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Water Use and Access Country Resources</p> <p>Qatar’s Water Woes: http://www.dohastories.org/?p=71 Qatar Fresh Water Challenges: http://www.theedge.me/qatars-fresh-water-challenges/</p> <p>Water Use in the United States: http://nationalatlas.gov/articles/water/a_wateruse.html Water Use Today: http://www.epa.gov/watersense/our_water/water_use_today.html</p> </div> <ol style="list-style-type: none"> Students answer the following questions about their partner country: What are the water resources present? How is fresh drinking water accessed? Where is the drinking water from? What processes make the water drinkable? (EX: Desalinization, UV rays) Students assess the water situation in 2025 in their partner country. Will there be enough fresh drinking water? What steps might they take to protect and preserve their water resources? Discuss. Students spend the next week collecting personal water use data to understand how their actions affect the larger water supply. Use the following questions to lead a discussion on personal water use. <ul style="list-style-type: none"> • How do you use water everyday? • What activities do you think use up the most amount of water? • Do you think your use more or less water than your peers in other countries? • Data Collection: Review the activities on the chart (SW p. 35). For the next week, students are to record the number of times they perform any of the tasks on the chart. Calculate water usage: Once the data has been collected for the week, students calculate their water usage by adding up the number of times each activity was performed. This number should be entered into the column 	



labeled “Total Number of Times.”

- The number of times should then be multiplied by “Estimated Amount of Water Used” and recorded in “Total Weekly Water Use.”
- Once each activity has been calculated, the students add together each row to get their “Total Weekly Water Use by Student.”

7. Discussion:

As a class, students reflect upon their recorded weekly water usage. Have one member of the class add up all the numbers and divide by the number of students in the class on the board. This is the average water usage. Discuss results.

- What factors do you think resulted in discrepancies among different student’s records?
- What was the average water use in the class?
- Do the results surprise you? Why or why not?
- In the last module, we discussed how human activities and development can impact an ecosystem and cause climate change. How does water consumption relate to this idea? How can the water cycle be disrupted by humans?

8. Share: Students post their water usage data to the virtual platform.

9. View: Students review the data of three students from their partner school and comment on one of the following: How does their data compare? Explain why you think there are similarities and differences between your data and the other data?

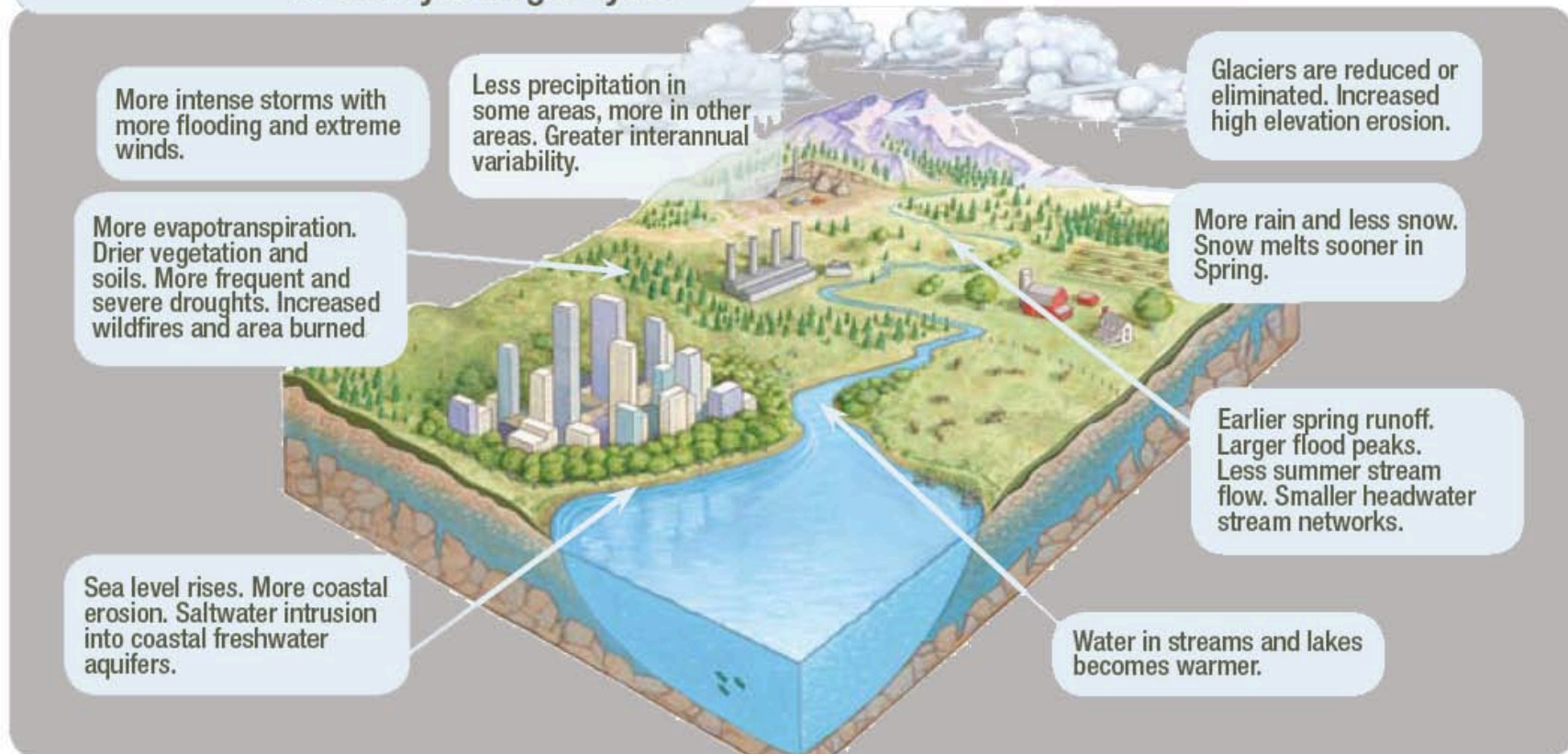


15 PERSONAL WATER USE CHART										
Record how much water you use everyday for a week by recording how many times a day. Break down your water use based on the following activities below.										
Activity	Sun	Mon	Tu	Wed	Th	Fri	Sat	Total Number of Times	Estimated Amount of Water Used	Total Weekly Use (L)
Washing face/hands									4 L	
Taking a Shower (standard shower head)									200 L	
Taking a shower (low flow shower head)									100 L	
Taking a Bath									150 L	
Brushing Teeth (water running)									8 L	
Brushing Teeth (Water turned off)									1 L	
Flushing the Toilet									20 L	
Shaving									8 L	
Getting a Drink									1 L	
Cooking a Meal									12 L	
Washing dishes by hand									40 L	
Running a Dishwasher									60 L	
Doing a Load of Laundry									120 L	
Watering Lawn									1200 L	
Washing Car									200 L	
Total Weekly Water Use by Students (liters)										

¹⁵ Adapted from: "Personal Water Use Chart," *Stevens Institute of Technology, Center for Improved Engineering and Science Education*, 2010, <http://www.ciese.org/media/live/curriculum/drainproj/personalwateruse.pdf>,



Projected climatic changes to the hydrologic cycle



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¹⁶ Adapted from: "In Brief: Climate Change and Water," *The United States Department of Agriculture*, 2008, [http://www.fs.fed.us/ccrc/files/CC and Water In Brief.pdf](http://www.fs.fed.us/ccrc/files/CC_and_Water_In_Brief.pdf)



ACT

Milestone 1

Project Launch: Topic of Interest, Driving Question, and Need to Know List

TIME

60 minutes in-class planning
45 - 60 minutes additional preparation (outside of class, if needed)

MATERIALS

Challenge Letter, p. 14
Project Guide, pgs. 15 - 16, Part A and B
Project Format Options, p. 12
“Need to Know” Worksheet, p. 40

OVERVIEW

In this first milestone, students determine their group’s project topic and goals, develop a driving question, and create a “need to know” list to get their project started. Students reflect on their first IVC, as well as the local, national and international environmental issues they highlighted in the Global Lens activity, to draw inspiration for the issue they would like their project to address.

In order to complete Milestone 1, students must return to the [Project Guide](#) (pgs. 15 - 16) and complete [Part A: Project Overview](#) and [Part B: Target Audience](#).

INSTRUCTIONS

1. **Introduce the Project:** Students or group of students read the Challenge Letter aloud (p. 40) to his/her peers. Lead a brief class discussion:
 - *What are your thoughts and feelings around taking on the Global Nomad challenge?*
 - *What obstacles do you think you will face during this challenge?*
 - *What is one thing you hope to achieve as a result of this challenge?*
 Record student responses, to be revisited at the conclusion of the project for reflection.
2. **Topic Selection Activity:** *What environmental issues in your local or global community do you want to positively influence with your project? Why are these important to you?*

Free Write/Draw: Students write or draw for five minutes about the brainstorm question above, focusing on the main topics they would like to pursue in the collaborative project. Have students consider what they want to learn about themselves, their peers, current events, and the world through cross-cultural dialogue, and how they would like to positively engage – and change – their communities. Students reflect on their first IVC and the local, national and international environmental issues that they highlighted in the Community Lens activity as they complete this brainstorm.

Identify Trends: Have students identify the top 5 recurring words or phrases in their writing and compare these with peers to create a group list of the 3 most common or important topics.



Propose a Topic: Students decide or vote on 1-2 topic(s) that they would like to explore further through the collaborative project.

Topic(s): _____

Why are these topics important to us? How do they connect to our lives and communities?

In the next IVC with their partner school, students will have the opportunity to discuss their topic(s) and receive feedback. Students may decide to pursue the same topic together, or investigate different topics, with each other's support.

3. Identifying the Goal, Project Type and Media Output for the proposed project.

Using the Format Options Guide (p. 12) have students brainstorm the following:

a. What goal do you want to accomplish with your project? (Check one box)

<input type="checkbox"/> Awareness	<input type="checkbox"/> Advocacy	<input type="checkbox"/> Action
Awareness projects inform others about an issue. They expand a community's understanding of a problem, empowering people through knowledge.	Advocacy projects speak out or argue for a specific cause or policy that would address an issue. Advocates target decision-makers in a community who can help change the status quo.	Action projects develop and implement real-world solutions to community problems. They involve direct activities that support or counter a cause.

b. What project type and media output do you think will help you achieve this project goal best?

In small groups, have students offer three reasons why a specific project type and media output will help achieve their project goal. Have students present these to the class and collectively decide upon a project type and media output (below) to share with their partner for feedback.

Project Type: ☐ Campaign ☐ Documentary ☐ Event ☐ Public Service Announcement

Media Output: ☐ Visual Arts ☐ Performing Arts ☐ Writing ☐ Event-Based
Specific output (for example: radio piece, blog, photo story): _____



4. Crafting a **Driving Question (DQ)** for the proposed project.

What is a **Driving Question (DQ)**? A **driving question** provides the purpose for the project and guides its creation. **The Collaborative Project should answer the DQ.**

Characteristics of a Good DQ

- Provocative and challenging: It's about an important or urgent issue that must be addressed.
- Open-ended and not easily answered: It requires inquiry, research, and creativity.
- Relevant to your lives and community: It should inspire you to take action!

Format of a DQ: *The four-part structure will help students write a great driving question!*

DQ Part	1. Question word that frames the issue...	2. Person/entity that is the focus...	3. Action/challenge that the entity accomplishes...	4. Audience* for the action or challenge?
Ideas	How do/can, What, Should, Could	we as [youth, class, citizens], town, country, school	build..., create..., design..., solve..., make...	real world problem, for a group, for a public audience
Example	How do	we, as citizens,	reduce water usage	in our school?
	<i>How do we, as citizens, reduce water usage in our school?</i>			
Practice				

*The audience should be real people who you can reach, and who would benefit from the project.

Based on the guidelines above, write your Driving Question as a class: _____

5. **Need to Know List:** Now that students have a driving question, they must decide what knowledge and skills they already have, and what they need to know to complete this project.

Have students use the "Need to Know" worksheet (p. 40) to record this information. Encourage them to **revisit and revise this list throughout the project**, checking off the list as they answer "need to know" items during research.

6. **Project Guide:** Using the information recorded in Milestone 1 above, direct students to the Project Guide (pgs. 15 - 16) to complete Part A: Project Overview and Part B: Target Audience.

1. Project Launch
*Driving Question,
Goals, Project Plan*

CONGRATULATIONS!
✓ Milestone 1 is complete!



“Need to Know” Worksheet

What do you already know about the topic?	What do you still need to know to answer your driving question? <i>Try not to answer the questions you need to know right away! This process will be part of your research.</i>	Where will you get this knowledge? <i>Examples: resources, partners school, interviews, site visits</i>	What skills or equipment do you need to accomplish this?



Project Guide – Part A and B (also on pgs. 15 – 16)

As a **living document**, the **Project Guide** will lead the development of your project. Upon completion of each **milestone**, refer to this guide and fill in – **or revise** – the relevant information.

A. Project Overview

Refer to Format Options, page 12, for additional guidance.

Topic: _____

Title: _____

Goal: ☐ Awareness ☐ Advocacy ☐ Action

Driving Question (DQ): _____

Objective: Based on your DQ and goal, what do you hope to achieve with your project?

Project Type: ☐ Campaign ☐ Documentary ☐ Event ☐ Public Service Announcement

Media Output: ☐ Visual Arts ☐ Performing Arts ☐ Writing ☐ Event-Based
Specific output (for example: radio piece, blog, photo story): _____

Calendar: If you are engaging in IVCs, milestones should be completed and shared online one week before the related IVC, so you and your peers have time to give and receive feedback. You may have more than one milestone per IVC.

Milestone	IVC Number and Date <i>Ex: IVC 3, April 2</i>	Milestone Due Date <i>1 week before IVC (Ex: March 25)</i>
1 – Project Launch		
2 – Outline & Content		
3 – Rough Draft		
4 – Finalize & Share		

B. Target Audience

Who is the target audience? (ex: peers, teachers, community, family, country)

Why is this an important target audience?

How will we share our project with our audience? (ex: In local events? Online?)



IVC #2 Preparation and Outline

TIME

IVC Preparation – 1 class period (before IVC)

IVC – 90 minutes (including dial-in)

MATERIALS

IVC #2 Preparation Outline

OVERVIEW

The outline below will be used as a guide for discussion during the second IVC. Have students review and complete this outline prior to IVC #2.

INTERACTIVE VIDEOCONFERENCE #2: WATER USE AND ACCESS

Day

Date

Tech Dial-in Time

____:____

Conference Start Time

____:____

IVC Outline

I. Introduction and Greetings (5 minutes)

GNG facilitator welcomes all participating students to the second IVC meeting. One representative from each school shares:

- Number of students participating in IVC #2:
- Something interesting that has happened in your community since the last IVC:
- A national/international event that has impacted you/your community since the last IVC:
- Local weather and temperature (in degrees Celsius and Fahrenheit):

II. LEARN: Personal Water Use Data (20 minutes)

Students share and compare their personal water use data. One week prior to the IVC, they will post data and view partner's data on C2C. One student from each class should lead a brief presentation on water use and access in their partner country.

Select one to two class representatives to share water use data

Select one to two class representatives to present on water use and access in the partner country.

Three questions or comments to ask during the IVC.

-
-
-

**II. ACT: Milestone 1: Collaborative Project Launch (30 minutes)**

In this second meeting, students will discuss progress towards completion of Milestone 1. Share your project topic and why this is significant and relevant to an issue in your life. Also share your driving question and key elements of your need to know list for feedback and comments from your partner school. During this conversation, decide whether you want to move forward with both projects, or if you want to choose/combine topics from each group to co-construct one project.

- Project topic and relevance:
- Driving Question:
- Need to Know:

-
- Feedback for peers:

III. 60-Second Showcase! (10 minutes)

Select three student representatives to share a personal interest or talent for their peers. *Try to maintain Show and Tell as predominately visual or require little technical explanation, especially for IVCs using consecutive translation.*

- Name of Representative:
- Name of Representative:
- Name of Representative:

IV. Conclusion (5 minutes)

GNG facilitator thanks all students and teachers for participating and reminds participants to prepare the next module and collaborative project work for the upcoming IVC.



REFLECT

IVC #2 Debriefing Conversation

TIME: 15 minutes */(Either immediately following or shortly after IVC meeting)*

MATERIALS Pen, paper, internet access to online platform

OVERVIEW

Following the IVC, engage your students in a short reflective conversation on their experiences to date. Complete the online educator feedback survey with your students' reflections in mind.

INSTRUCTIONS

Use the suggested reflection questions below to guide a conversation with your class.

1. REFLECT on your Conversation:

- What new information did you gain from your peers about water scarcity and the implications of water use or overuse on countries worldwide?
- Are the issues most important to your community similar or different from those affecting your peers?
- Of the topics covered in the IVC, which would you like to discuss further?
- What questions do you have for the next IVC?
- How do you feel about the outcomes of your first collaborative project discussion? Are you content with your topic?
- What challenges, if any, do you anticipate as you start the research phase of the project?

2. CONNECT on C2C:

- On C2C, post a change in your daily life you will implement to help conserve water.
- On C2C, post remaining questions you have for your peers. Make sure to check back and answer questions from your peers.

EDUCATOR FEEDBACK SURVEY:

Following each IVC, educators are encouraged to complete the "Educator Feedback Survey." The survey should not take more than 10 minutes to complete, and will be e-mailed directly to educators immediately following the IVC.

Module 3: Cause and Effect

Overview

In **Learn**, students explore the way they use “stuff.” Through a study of product life cycles and an examination of the packaging associated with student lunches they understand the impact their “stuff” has on the environment. A “School Site Cleanup” will be conducted to identify and understand common wastes in the school community.

In **Act**, collaborative project development continues in this module with planning and outlining. Throughout the project development phase, students are expected to seek and incorporate feedback on their project plan, outline, and draft. **Milestone Two**, Outline and Content.

Background

Our society demands “stuff”, things like plastic bags, **single-use** water bottles, and other everyday items. However, everything that involves metal and plastic uses **natural resources**, requiring energy to manufacture, and produces waste. Some products have a large impact on the environment, and some have less. Products that can be **recycled** have less of an impact on the environment and are considered environmentally friendly. Products that are not recycled or **reusable** are thrown into landfills or end up as pollutants in our natural environment.

Engineers consider the environmental impacts to our air, water and natural resources when creating a new product. To do this, engineers consider the entire **product life cycle** — from materials acquisition, materials processing, manufacturing, packaging, transportation, use and disposal of the product. These represent all the **life phases of a product**, similar to the life cycle of an animal found in nature. Looking at the life cycle of a product helps us understand the impact to Earth's natural resources and energy and, particularly, how we produce waste and what we can do to limit the **waste stream**.

Manufacturing and waste has a direct link to climate change, as all products require raw materials, production and transport, which all utilize energy and use nonrenewable resources like fossil fuels increasing the amount of greenhouse gases in our atmosphere. Our extreme usage of nonrenewable resources is one *cause* that leads to the *effect* of global climate change.

Module Objectives

- Gain a greater understanding of the impact human activities have on the environment
- Understand the source of pollution and how this pollution is dealt with in their own community.
- Collaborate with peers within your class and in your partner school to complete Milestone Two: Outline and Content

	Activity	Page	Estimated Time
LEARN	Energy and Waste	46-47	30 minutes
	Packaging, Processing and Pollution	48-49	40 minutes
	Legacy of Litter	50-51	
ACT	Milestone 2: Outline & Content	52-54	60 minutes in class planning
	Interactive Videoconference (IVC) #3	55-56	30 minutes preparation 60 minute IVC + 30 min. dial-in
REFLECT	Debriefing Conversation	57	15 minutes

LEARN

Energy and Waste	
TIME 30 minutes	MATERIALS access to Internet videos, Life Cycle Infographic and Life Cycle of Stuff (p 47)
KEY VOCABULARY <i>product life cycle, pollutants</i>	
OVERVIEW Students identify types of litter and debris, and learn about the life cycle of products. They also identify the environmental impacts of products they use every day.	
INSTRUCTIONS <ol style="list-style-type: none"> 1. Activate students' prior knowledge. Students brainstorm different types of litter or debris. Make a list on the board. What happens to litter? Where does it go? <ul style="list-style-type: none"> ○ Students watch a clip from Bag-It http://www.youtube.com/watch?v=MRjPkl_4lmM – ○ While watching the video, encourage students to think about how their actions could contribute to or help solve the “plastic problem.” Explain to students that they will be conducting a school-site cleanup and collecting debris. ○ Pose the questions: What are plastics made of? Are their health impacts of plastics? How does plastic production and consumption lead to factors that cause climate change? ○ Lead students through a life cycle of a plastic bag on the board 2. Go through the 5 Stages of a Product Life Cycle *See Life Cycle Infographic (p 47) -Emphasize that all along the life cycle of a product there are pollutants emitted, whether the pollutants are greenhouses gases (like carbon dioxide) or physical waste (like scrap metals and plastics) from the formation of products. Also highlight the end destination of products are often landfills or incinerators and there are serious implications of both destinations. 3. Students list other everyday products that can turn into pollutants during its life cycle and identify the impacts of the product life cycle on the environment. 4. Go through each stage of the life cycle and students give examples of how it might lead to pollutants entering our natural environment. 5. Divide students into small groups and have each group choose a different product. Have them draw a product life cycle and have them list effects of life cycle on humans, wildlife and natural environment. 6. Present- Groups take turns presenting to the class their product life cycle and an alternative to the product ending up in a landfill or as another type of pollution. 7. Sources and impacts of products. Emphasize the fact that the sources and impacts of pollution are highly varied and involve all people and ecosystems, no matter where on the globe they are. 8. Challenge the students to go a day without using anything plastic. 	

Source: "Climate Change and the Life Cycle of Stuff"
<http://www.epa.gov/climatechange/climate-change-waste/life-cycle-diagram.html>



HOW LONG 'TIL IT'S GONE?

Estimated decomposition rates of common marine debris items

 AVERAGE LIFE EXPECTANCY



Packaging, Processing, and Pollution¹⁷**TIME**

1 period of activity

MATERIALS

pencils, paper, "What's in Your Lunch?" (p 49)

OVERVIEW

Students investigate the packaging of food items and evaluate if waste can be reduced. Students gain awareness of the consequences that packaging and waste has on the environment.

INSTRUCTIONS

1. **Question and Brainstorm:** How does waste and pollution contribute to climate change? Reiterate that products, like plastic, are often derived from fossil fuels. Make list of brainstorm ideas.
2. **What's in your lunch?** Students begin an investigation by writing down the contents of their lunch. If some students eat in the cafeteria, use pictures of sample lunches.
3. **Questions:** What are some the differences in the way that items are packaged? What are the benefits of packaging versus not packaging certain products? What are ways to reduce or eliminate packaging for some goods?
4. **What's in your lunch?** Have students record, on the worksheet on the next page, that was consumed during lunch and the different types of packaging that the food was in.
5. Compare results with other students. What were your findings? Are most food items packaged? If some are not, what kinds of food are they? Do you find that processed foods have more packaging?
6. **Research:** Explore the Recycling and Waste Disposal Guidelines in your community and compare and contrast recycling rules and guidelines across communities and with your partner schools community!
7. **Community Action!** Students list things that they could do to limit waste not just in their lunchroom but also in their community!
8. **Share:** Students post their tables to the online platform.
9. **View:** Students compare the top things that were packaged and what they were surprised about.

WHAT'S IN YOUR LUNCH?

Tally the associated points for packaging.

The lunch with the lowest impact on the environment, the fewest amount of points, is a winner!

You accumulate points as follows:

- 0 points: No packaging!
- 1 point: One kind/layer of packaging
- 2 points: Two kinds/layers of packaging and so on... for each layer, or kind of packaging.

You subtract points as follows:

- -1 point: Recyclable packaging (If Applicable Use Recycling Guidelines for Your Area)
- -1 point: Reusable packaging (Create a list for the other uses)
- -1 point: If you can present a realistic alternative packaging techniques

¹⁷ Adapted from: "Bag It The Movie: What's in Your Lunch," *Bag It The Movie: Is Your Life Too Plastic?*, 2011, <http://www.bagitmovie.com/>

WHAT'S IN YOUR LUNCH?¹⁸

Tally the associated points for packaging. The lunch with the lowest impact on the environment, the fewest amount of points, is a winner! Tally the associated points for packaging.

Ex: Yogurt - +1 Plastic container, +1 Foil Top, -1 Recyclable, -1 Alternative Use; Apple – 0 No Packaging, -1 Compostable, 0 Not Reusable (Each food, depending on the amount of packaging or the re- usability of the packaging, is assigned points.)

FOOD	EX: YOGURT				
LAYERS OF (+1 point)	PLASTIC CONTAINER +1				
LAYER 2 (+1 point)	FOIL TOP +1				
LAYER 3 (+1 point)					
RECYCLABLE OR COMPOSTABLE (-1 point)	YES, IT HAS A 2 ON THE BOTTOM. -1				
REUSABLE? If so... Alternative Use Idea (-1 point)	YES, STORAGE FOR PONYTAIL ELASTICS. -1				
ALTERNATIVE WAY TO PACKAGE (-1 point)	BUY A LARGE YOGURT CONTAINER INSTEAD OF MANY SMALL ONES. I COULD MAKE MY OWN YOGURT -1				
TOTAL	-1				

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¹⁸ Ibid.

A Legacy of Litter¹⁹

TIME

1 period of activity and 15 minutes follow up during the next class meeting

MATERIALS

Trash bags, Latex gloves, Recycling bin, Pencils

OVERVIEW

Through a school site clean up students collect and analyze debris data and compare it with their partner school. By the end of the exercise students explain how humans contribute to and help solve problems associated with waste.

Note: This activity is meant to take place outside of the classroom in an area near the school. You may need to make prior arrangements in order to leave the school with the students. You will also have to consider the weather when planning this activity.

INSTRUCTIONS

1. In small groups, students brainstorm types of garbage/litter they expect to find around their school grounds. Each student open to the School Site Cleanup Data Table, the data sheet they will be using is designed to record all garbage/litter in your school site.
2. **Conduct the school site cleanup and record data.**
 - Using the School Site Cleanup Data Table, students conduct their own cleanup on their school site. Remind students to use gloves and avoid any dangerous materials. Students sort the litter into categories: items that go into the trash, reusable items, and different types of recyclable items (plastic, metal, glass, paper).
3. After cleanup is complete, students count the total number of debris items found by category for the entire class and then calculate the percentage of the total comprised by each category. Students record results in School Site Cleanup Data Table.
4. Community Action! Students list things that they could do to limit waste.
5. **Share:** Students post their tables to the online platform.
6. **View:** Students compare the top 5 most collected debris from their school. Students also post a reflection on what they learned from their cleanup or from the process of comparing debris data between schools.

¹⁹ Adapted from: "Marine Debris: A Legacy of Litter," *National Geographic Education*, 2010, http://education.nationalgeographic.com/education/activity/marine-debris-a-legacy-of-litter/?ar_a=1

[illegible]

Bags of Metal? _____ Bags of Glass? _____

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ACT

Milestone 2

Project Outline & Content

TIME

60 minutes in-class planning
45 - 60 minutes additional preparation
(outside of class if needed)

MATERIALS

Project Guide, pgs. 15 - 16, Part A and B
Project Team Roles, p. 13
Feedback Guide, p. 17

OVERVIEW

In this second collaborative project milestone, students view a completed sample project in one of the three categories: awareness, advocacy, or action. To guide them in their own project creation, students identify the steps in creating the sample project, and define what made it successful in achieving its goal. Then, students model this process to outline the steps needed to complete their own project. Students will identify team roles and draft a narrative project overview.

To complete Milestone 2, students must fill-in Part C: Project Team Roles and Part D: Activity and Materials Chart of the Project Guide (pgs. 15 – 16).

INSTRUCTIONS

- 1. View Sample Project:** Based upon the intended goal of their own project, have students select one of the six projects below to view/read/observe:

Awareness	<i>OneLENS: Public Service Announcement</i> http://www.youtube.com/watch?v=Xn3aCGUG1qs&list=SP9807DC6DB80322F1	<i>YouthLINKS: Collaborative Mural</i> http://www.youtube.com/watch?v=mhPU1Mj1r1A&list=PLJo_lhg1LV0CuEU-sia2PqevX0F8ebsMO
Advocacy	<i>One Million Bones: Join the Movement!</i> http://www.youtube.com/watch?v=FFukmsLLG0k	<i>ETN: Student Interactive Theater</i> http://www.slideshare.net/mollyjlevine/etn-vocational-school-student-interactive-theater
Action	<i>Kids vs. Global Warming – Video and Blog</i> http://www.youtube.com/watch?v=PpMYkijNJuw&feature=relmfu (Video) http://www.imatteryouth.org/home.html#lblog/ci6c (Blog)	<i>Shumate Middle School, STOMP Out Bullying Campaign:</i> http://www.thenewsherald.com/articles/2012/05/23/news/doc4fbc105f4d2ba723260472.txt?viewmode=fullstory

After exploring the project, have students answer the following either in small groups or as a class:
What did this project make you feel, think, or want to do as a result of viewing?

What elements of this project helped it reach its goal of awareness, advocacy or action?

What could have been strengthened to better reach the project goal?

In what ways do you think this project impacted its school and community?



- 2. Project Team Roles:** It took more than one person to complete the project you viewed. Have students indicate what roles they think individuals played in completing the project they viewed, referring to the Project Team Roles (p. 13) for guidance.

- ☐ Group Leader
- ☐ Research Committee
- ☐ Logistics Committee
- ☐ Content Committee
- ☐ Documentation Committee
- ☐ Outreach Committee

- 3. Activities and Materials:** Ask students – What steps do you think the group took to complete the project you viewed? What materials or resources do you think the project team needed?

Have students imagine that they were on that project team. In small groups or as a class, record all of the steps, materials, resources, and roles students think were needed to make the sample project successful.

Activity (Step)	Materials/Resources Needed	Committee Responsible
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		



4. Now it's your turn! Identify Project Activities and Team Roles for Your Own Project:

Using their notes on what made the sample project successful, have students list the team roles, step-by-step process, and materials/resources needed to complete their own project.

Encourage students to be as specific as possible in outlining steps. Remind them to include deadlines with the IVC dates in mind!

Have students use the Project **Team Roles** (p. 13) to make sure **every person in the group has a role** in the collaborative project. If applicable, be sure students are prepared to discuss team roles with their partner school.

5. Project Guide: Using the information recorded in step 4 above, direct students to the Project Guide (pgs. 15 – 16 and pages xx-xx) to record this information in Part C: Team Roles and Part D: Activity and Materials Chart.

6. Narrative Project Outline: It is important that students are able to describe the story of their project. As a group, have student create a narrative outline for the project. Project outlines could be in the form of:

- Image criteria/subject list for photo story
- Argument points for letter-writing campaign
- Storyboard for a short film
- Bulleted narrative of theatre/radio piece
- Interview questions for live debate

7. Presentation, Feedback, Revision: Have students present their narrative project outline to their peers for feedback, in class and during the IVC. Presentations should be 5-8 minutes in length and give peers a sense of the narrative, story, or argument that the project will tell. Use the **Feedback Guide** (p. 17) to give and receive feedback.

2. Outline & Content

*Build Knowledge,
Content, and Skills to
Answer DQ*

CONGRATULATIONS!

✓ Milestone 2 is complete!



Project Guide –Part C and D (page 15-16)

C. Project Team Roles

Refer to Project Team Roles, page 13, for additional guidance

Student Roles: *Record your group's roles here.*

Group Leader: _____

Research Committee: _____

Logistics Committee: _____

Content Committee: _____

Documentation Committee: _____

Outreach Committee: _____

Partner School Role (if applicable): *What do you need from your partner school?*

D. Activity and Materials Chart

Record the step-by-step process for completing your project in the chart below, taking into account all student roles. Specify the materials you need, deadline for each step (keep the milestone deadlines in mind!), and committee responsible for each activity.

Activity (Step)	Materials/Resources Needed	Deadline	School Responsible	Committee Responsible
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

IVC #3 Preparation and Outline	
TIME IVC Preparation – 1 class period (before IVC) IVC – 60 minutes (including dial-in)	MATERIALS IVC #3 Outline
OVERVIEW The outline below will be used as a guide for discussion during the third IVC.	

INTERACTIVE VIDEOCONFERENCE #3: ENERGY AND WASTE	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

IVC Outline

I. Introduction and Greetings (5 minutes)

GNG facilitator welcomes all participating students to the third IVC meeting. One representative from each school shares:

- Number of students participating in IVC #3:
- Something interesting that has happened in your community since the last IVC:
- Something you learned from the previous IVC:
- Local weather and temperature (in degrees Celsius and Fahrenheit):

II. Learn: A Legacy of Litter (20 minutes)

Using your experiences recording your lunch food packaging and the school cleanup activity, discuss what surprised you and comparing what you found that to your peers near and abroad.

What were the most common items found during the schoolyard cleanup?

What are alternatives to packaging and waste?

Select four representatives. Three will explain their ecological footprint, and one will explain how they might reduce their ecological footprint.
<ul style="list-style-type: none"> ➤ Name of Class Representative; : ➤ Name of Class Representative;: ➤ Name of Class Representative: ➤ Name of Class Representative:
After viewing the ecological footprint data posted by your partner school, record three questions or comments to ask during the IVC. ➤ ➤ ➤

III. Discussion on Flows, Cycles, and Pollution (20 Minutes)

What are ways to reduce waste and pollution?



Record three thoughtful and reflective questions.

-
-
-

IV. ACT: Milestone 2: Outline & Content (25 minutes)

In this third meeting, students will share their narrative project outlines for feedback from their peers. They also share one resource or current news article collected during the research phase. If applicable, students will also inform peers of what will be needed to help carry out the collaborative partnership of the project.

Use the **Feedback Guide** to guide your responses to your peers, and be sure to have someone recording notes to make revisions to your own work!

- Narrative Project Outline Presentation:

- Current Events on Collaborative Project Topic:

-
- Feedback Guide notes:
 - I hear / I see...
 - I want more of...
 - I wonder...

V. 60-Second Showcase! (10 minutes)

Select three representatives to share a personal interest or talent for their peers. Presentation of the talent should not exceed 60 seconds. *Try to maintain Show and Tell as predominately visual or require little technical explanation, especially for IVCs using continuous translation.*

- Name of Representative:
- Name of Representative:
- Name of Representative:

VI. Conclusion (5 minutes)

GNG facilitator thanks all students and teachers for participating and reminds participants to prepare for the next module and the collaborative project.



REFLECT

IVC #3 Debriefing Conversation	
TIME 15 minutes (<i>Either immediately following or shortly after IVC meeting</i>)	MATERIALS: Pen, paper, internet access to online platform
OVERVIEW Following the IVC, engage your students in a short reflective conversation on their experiences to date. Complete the online educator feedback survey with your students' reflections in mind.	
INSTRUCTIONS <i>Use the suggested reflection questions below to guide a conversation with your class.</i> 1. REFLECT on your Conversation: <ul style="list-style-type: none"> ○ What are ways to reduce your ecological footprint? Were the results surprising? ○ Environmental pollutants in one country affect the rest of the world. From the What's in your lunch activity and the trash cleanup exercise, what are the major pollutants in your partner country and in your country? What are some actions that you and your peers can take to address limiting these pollutants for a more sustainable future for everyone? ○ Of the topics covered in the IVC, which would you like to discuss further? ○ What questions do you have for the next IVC? 2. CONNECT on C2C : <ul style="list-style-type: none"> ○ On C2C, post one way to combat litter and debris in your school and community. ○ On C2C, post remaining questions you have for your peers. Make sure to check back and answer questions from your peers. 	

EDUCATOR FEEDBACK SURVEY:

Following each IVC, educators are encouraged to complete the "Educator Feedback Survey." The survey should not take more than 10 minutes to complete, and will be e-mailed directly to educators immediately following the IVC.

Module 4: Society, Ethics & Politics

Overview

In **Learn**, students study the different ways countries around the world are reacting to climate change. They read provided information and conduct their own research on an assigned “country group” to understand the similarities and differences between the stated positions and potential climate change impacts of assigned group and their home country. Students investigate related policy initiatives at the state, local, national and international level.

In **Act**, students continue working on their collaborative project by reflecting on feedback and revising outline into a rough draft. **Milestone Three**, Rough Draft, should be completed by the conclusion of this module.

Background

Environmental public policy includes laws and agency-enforced regulations that deal with a society’s interaction with the environment at all levels of government: local, state, national and international. The purpose of environmental public policy is to promote the common good, which can include the improvement of human welfare and the protection of the natural world. Human societies and their activities have the potential for doing great damage to the environment, which can have a direct impact on present and future human welfare. As societies develop, human activity assumes increasingly broader dimensions, with greater impacts on the whole society. The lack of environmental policy can result in costs to human welfare, which can be felt in the areas of health, economic productivity and the ongoing ability of the natural environment to support human life needs. Some policies are developed at local levels to solve local problems. However, many problems are broader in their scope and must be addressed at higher levels of government, including the international level.

The **United Nations Framework Convention on Climate Change** (UNFCCC) is an international treaty that addresses rising global temperatures and its affects on the earth’s changing climate worldwide. The UNFCCC currently has 195 signatories²¹, or parties that are in agreement with the terms and purpose of the treaty. The UNFCCC was adopted in 1992 and has been in effect since 1994. Every year a Conference of the Parties (COP) is held. During this meeting, signatories to the convention gather to discuss and assess the Convention’s progress towards limiting and coping with climate change, and outline necessary steps for continued implementation of the Convention. The **Kyoto Protocol** is an international protocol of the UNFCCC that focuses specifically on reducing **greenhouse gas** emissions to combat climate change. The meeting of the parties to the Kyoto Protocol (CMP) is also held during the annual UNFCCC COP meeting. The 18th COP (COP 18/CMP 8) was held in Doha, Qatar in 2012.

Module Objectives

- Understand the efforts, challenges and outcomes of national/int’l environmental policies.
- Collaborate with peers within your class and in your partner school to complete Milestone Three: Rough Draft

	Activity	Page	Estimated Time
LEARN	Climate Change Challenges	60-61	30 minutes
	International Community and Climate Change	62	40 minutes
ACT	Milestone 3: Rough Draft	63-65	60 minutes
	Interactive Videoconference (IVC) #4	66-67	30 minutes preparation 60 minute IVC + 30 min. dial-in
REFLECT	Debriefing Conversation	68	15 minutes

²¹ The UNFCCC has 195 total signatories, 194 states plus 1 regional organization

LEARN

Climate Change Challenges**TIME:** 45 minutes**MATERIALS:** Computer with Internet Access,
Country List (p 61)**KEY VOCABULARY**

United Nations Framework Convention on Climate Change (UNFCCC); Kyoto Protocol; Greenhouse Gas (GHG); Climate Change, Ice Cores, parts per million (ppm)

OVERVIEW

Students explore ways that different countries and regions deal with climate change impacts and potential impacts.

INSTRUCTIONS

1. Break the class into four evenly sized groups.
2. Assign each group a “Country Group” from the provided list (#1 Developed Country with growing emissions, #2 Developed Countries that have already made substantive reductions in emissions, #3 Developing Countries, #4 Developing countries with rapidly growing emissions, #5 Oil Producing Countries)
3. Groups will discuss the countries included in their assigned “Country Group” and what they have in common. Students compare their assigned “Country Group” to their home country and highlight the similarities and differences.
4. Students research what their countries position is on climate change and how climate change will impact their country. Students use the resources listed below as a starting point begin research to additional resources (no Wikipedia articles) to use as support for their research.
5. Come back together as a class and discuss students’ findings. Discuss what actions their home country has taken to combat climate change. How does it compare to the other “Country Groups”? What are steps can their country group to improve their stance on climate change?

GLOBAL RESOURCES ON CLIMATE CHANGE ²²	
Potsdam Institute for Climate Impact Research: http://www.pik-potsdam.de/ International Research Institute for Climate and Society: http://irithree.ldeo.columbia.edu/	
United States Resources on Climate Change U.S. Global Change Research Program: http://www.globalchange.gov/ Energy Policy and Climate Change: http://www.usnews.com/topics/subjects/energy-policy-and-climate-change	Qatar Resources on Climate Change Qatar Foundation Telegraph – Qatar Tackles Climate Change: http://cdn.qf.com.qa/app/media/1204 Qatar could import fresh water from Chile: http://www.gulf-times.com/qatar/178/details/352150/chile-offers-to-export-fresh-water-to-qatar
Country Group #1 <i>United States, Canada</i> (Developed Country with Growing Emissions) <ul style="list-style-type: none"> - From 1992 to 2007, North American greenhouse gas emissions grew 20% - North America has one of the highest per-capita emissions in the world - Until 2007, the US was also the largest total emitter of greenhouse gasses (China has since surpassed the US) - The US is responsible for about 22% of the world's emissions of carbon dioxide - The US is one of the wealthiest countries in the world and has a highly diversified economy 	Country Group #2 <i>France, Germany, United Kingdom, Denmark</i> (Developed Countries that have already made substantive reductions in emissions) <ul style="list-style-type: none"> - These countries ratified the Kyoto Protocol and have been making reductions in greenhouse gas emissions. From 1990 to 2004 the countries achieved the following reductions (including land use changes and forestry): UK 58%, Denmark 22%, Germany 18%, Norway 18% - France closed its last coal mine in 2004 and now gets 80% of energy from nuclear power - Some of the wealthiest countries in the world. - Historically responsible for significant amounts of greenhouse gas emissions.
Country Group #3 <i>Brazil, South Africa, Mexico</i> (Developing Economy Countries) <ul style="list-style-type: none"> - These countries signed the Kyoto Protocol, but were not assigned legally binding emissions targets. - Their emissions, both per capita (per person) and total, are substantially lower than the US. - As developing economy countries, they are responsible for fewer historical emissions. - Segments of populations are vulnerable based on poverty and lack of access to daily necessities. 	Country Group #4 <i>China, India</i> (Developing Economy Countries with rapidly growing emissions) <ul style="list-style-type: none"> - These countries signed the Kyoto protocol, but were not assigned legally binding emissions targets. - Their per-capita emissions are well below those of developed economic countries. - Their economies are growing rapidly and their greenhouse gas emissions are increasing rapidly as well.
Country Group #5 <i>Ecuador, Iran, Iraq, Qatar, Saudi Arabia</i> (Oil Producing Countries) <ul style="list-style-type: none"> - These countries signed the Kyoto Protocol, but as transitional economies, they were not subject to binding emission targets. - Compared to the US, the emissions of these countries are relatively small. - A large percentage of the wealth of these countries comes from oil production, processing, and export. 	Country Group #6

²² Adapted from: "Global Warming Lesson Plan 6-12 Lesson Plan," Will Steger Foundation, 2010, <http://willstegerfoundation.org/curricula-resources/grades-6-12>

International Community and Climate Change	
TIME: 1-2 class periods	MATERIALS: Computer with Internet access
OVERVIEW Students identify environmental issues related to climate change and investigate related policy initiatives at the local, state, national and international level. Students will also explore the ways their partner school's country is handling the climate change issue.	
INSTRUCTIONS <ol style="list-style-type: none"> 1. Review the Background Information on the United Nations Framework Convention on Climate Change, the Kyoto Protocol, and the 18th Conference of the Parties (COP 18 / CMP) 2. Research and discuss. Students research the agenda topics and conference outcomes and list major topics and overarching themes. Discuss. <ul style="list-style-type: none"> ○ What actions is the international community taking to address temperature increase and climate change? ○ Does the international community face obstacles in implementing and achieving their goals? If so, what are these obstacles? ○ In your opinion, should all countries be held to the same environmental policy standards? Why or Why not? 3. Identify issues related to climate change. Using the information gathered from the conference research, students identify what they consider to be the most significant issues related to climate change. Examples may include: rising sea levels, global temperature increase, greenhouse gas emissions. 4. Position Statement: Students write a position statement with their chosen issue related to climate change. The position could be based on personal opinion but supported with specific evidence and examples. 5. Share: Student's post their position statement to the online platform. 6. View: Students view the partner schools Statements, and offer comments and feedback. 	

Crafting a Position Statement

How should decision makers approach the issue of climate change?

- **Keep it short:** Limit your letter to one page and one issue.
- **Identify the issue:** In the first paragraph state what issue you are writing about.
- **Focus on your main points.** Choose the three strongest points to support your argument and develop them strongly.
- **Make it personal.** State why the issue matters to you and how it affects you, your family, and your community.

ACT

Milestone 3**Rough Draft****TIME**

60 minute in-class planning
60 - 75 minutes additional preparation (outside of class if needed)

MATERIALS

Project Guide, pgs. 15 – 16
Feedback Guide, p. 13

OVERVIEW

In this third collaborative project milestone, students update their Project Guide, based on feedback from peers on the narrative outline. Then, they gather content and create the first draft of their project, receive feedback from peers, and update and revise their project plan as needed.

INSTRUCTIONS

1. **Reflect and Revise:** Based on feedback from their narrative outline, direct students to their Project Guide (pgs. 15 – 16), asking and answering the following and updating the Project Guide and Activity and Materials Chart (Part D) accordingly:
 - a. Is your project answering the Driving Question (DQ) (Milestone 1)? If not, do you need to revise your DQ or your project plan?
 - b. Review your “Need to Know” list (Milestone 1). What have you learned and what do you still need to know to complete your project? Are there new questions or subjects that you need to investigate?
 - c. How is your project addressing your target audience and their needs and/or interests?
 - d. Is your project addressing all six elements of a successful project according to the Criteria Wheel (p. 11)? If not, what elements of your project still need to be addressed to ensure your project is meeting the relevant criteria.

2. **Create Your Rough Draft:** Using the outline and updated “Activities and Materials Chart “ (Part D, Project Guide), as a foundation, have students continue gathering content and create a rough draft of the project.

Be sure students follow their project plan step-by-step and with group members fulfilling their individual roles to ensure the draft is successfully completed!

3. **Presentation, Feedback, Revision:** Have students present their rough draft – and changes to the Project Guide – to peers in class and during the IVC. Presentations should be 5-8 minutes in length and give peers a nearly complete vision and understanding of how the project unfolds to achieve its goal. Use the **Feedback Guide** (p. 17) to give and receive feedback.

3. Rough Draft

*Create and Revise
Project to Answer
DQ*

CONGRATULATIONS!

✓ Milestone 3 is complete!

Project Guide

*This living document will guide the development of your project. Upon completion of each **milestone**, refer to this **Project Guide** and fill in – **or revise** – the relevant information.*

A. Project Overview

Refer to Format Options for additional guidance.

Topic: _____

Title: _____

Goal: ☐ Awareness ☐ Advocacy ☐ Action

Driving Question (DQ): _____

Objective: *Based on your DQ and goal, what do you hope to achieve with your project?*

Project Type: ☐ Campaign ☐ Documentary ☐ Event ☐ Public Service Announcement

Media Output: ☐ Visual Arts ☐ Performing Arts ☐ Writing ☐ Event-Based

Specific output (for example: radio piece, blog, photo story): _____

Calendar/Deadlines: *If you are engaging in IVCs, milestones should be completed one week before the IVC date, so you can share your work online and receive feedback from peers. You may have more than one milestone per IVC.*

Milestone	IVC Number and Date <i>Ex: IVC 3, April 2</i>	Milestone Due Date <i>Ex: March 25</i>
1 – Project Launch		
2 – Build Knowledge (Content / Outline)		
3 – Develop Answer to Question		
4 – Present Project to Answer DQ		

B. Target Audience

Who is the target audience? (ex: peers, teachers, community, family, country)

Why is this an important target audience?

How will we share our project with our audience? (ex: In local events? Online?)

C. Project Team Roles

Refer to Project Team Roles for additional guidance

Student Roles: Record your group's roles here.

Group Leader: _____

Research Committee: _____

Logistics Committee: _____

Content Committee: _____

Documentation Committee: _____

Outreach Committee: _____

Partner School Role (if applicable): *What do you need from your partner school?*

D. Activity and Materials Chart

Record the step-by-step process for completing your project in the chart below, taking into account all student roles. Specify the materials you need, deadline for each step (keep the milestone deadlines in mind!), and committee responsible for each activity.

Activity (Step)	Materials/Resources Needed	Deadline	School Responsible	Committee Responsible
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

IVC #4 Preparation and Outline	
TIME IVC Preparation – 1 class period (before IVC) IVC – 90 minutes (including dial-in)	MATERIALS IVC #4 Preparation Outline
OVERVIEW The outline below will be used as a guide for discussion during the fourth IVC. Have students review and complete this outline prior to IVC #4.	

INTERACTIVE VIDEOCONFERENCE #4: INTERNATIONAL COMMUNITY AND CLIMATE CHANGE	
Day	Date
Tech Dial-in Time	_____:
Conference Start Time	_____:

Interactive Videoconference Outline

I. Introduction and Greetings 5 minutes)

GNG facilitator welcomes all participating students to the fourth IVC meeting. One representative from each school shares:

➤ Number of students participating in IVC #4:

VII. Something interesting that has happened in your community since the last IVC:

VIII. A national/international event that has impacted you/your community since the last IVC:

IX. Local temperature and weather...

II. LEARN: Presentation of Climate Change Challenges (20 minutes)

Students share and compare the results from the Country Group Activity.

What are some similarities and differences between you and your partner countries stance on climate change?

One week prior to the IVC, they will post data and view partner's data on C2C. They should prepare to present data and provide comments on peer data.

Select four representatives. Three will explain different methods of combating climate change.

➤ Name of Class Representative;

➤ Name of Class Representative;

➤ Name of Class Representative;

After viewing the data posted by your partner school, record three questions or comments to ask during the IVC.

a.

b.

c.

III. Discussion on Climate Change: Cause and Effect (20 Minutes)

Using your experiences writing the position statement and comparing that to your peers near and abroad, record three thoughtful and reflective questions.

Have students read and provide feedback on other students' position statements on C2C.

X.

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-

III. ACT: Milestone 3: Rough Draft (25 minutes)

In this fourth meeting, students will offer feedback on the rough drafts presented of one another's collaborative projects. Use the **Feedback Guide** (p. 17) to guide your responses to your peers, and be sure to have someone recording notes to make improvements into your own work!

➤ Rough Draft Presentation:

➤ Feedback Guide Notes:

- I hear / I see...
- I want more of...
- I wonder...

IV. 60-Second Showcase! (10 minutes)

Select three student representatives to share a personal interest or talent for their peers. Presentation of the talent should not exceed 60 seconds. *Try to maintain 60-Second Showcase as predominately visual or requiring little technical explanation.*

➤ Name of Representative:

➤ Name of Representative:

➤ Name of Representative:

V. Conclusion (5 minutes)

GNG facilitator thanks all students and teachers for participating and reminds participants that all collaborative projects must be completed by the next, and final, IVC.

REFLECT

IVC #4 Debriefing Conversation**TIME:** 15 minutes (*Either immediately following or shortly after IVC meeting*)**MATERIALS** Pen, paper, internet access to online platform**OVERVIEW**

Engage your students in a short reflective conversation on their experiences to date. Complete the online educator feedback survey with your students' reflections in mind.

INSTRUCTIONS

Use the suggested reflection questions below to guide a conversation with your class.

1. REFLECT on your Conversation:

- How do you think the energy policies of one country affect the rest of the world? Are all countries equally responsible to maintain sustainable energy policies?
- How do these international meetings affect you and your partner countries? Do you think they are effective?
- Did the
- Of the topics covered in the IVC, which would you like to discuss further?
- What questions do you have for the next IVC?
- How did feedback from your peers influence your plans for finalizing your project?
- What questions would you like to ask your partners during the final IVC?

2. CONNECT on C2C:

- On C2C, post an interesting article about sustainable energy or climate change in your partner country.
- On C2C, post remaining questions you have for your peers. Make sure to check back and answer questions from your peers.

EDUCATOR FEEDBACK SURVEY:

Following each IVC, educators are encouraged to complete the "Educator Feedback Survey." The survey should not take more than 10 minutes to complete, and will be e-mailed directly to educators immediately following the IVC.

Module 5: Environmental Action

Overview

In **Learn**, As a global citizen you can create change within your community and world. Students will learn about sustainable energy alternatives that combat climate change and our excessive use of nonrenewable fossil fuels. Students will also identify ways that they, and their community, can make a difference.

In **Act**, the collaborative project concludes in Module 5 with presentation of both the final product and an action plan for sharing the product with others. Milestone Four, Finalize and Share, should be completed by the conclusion of this module. While Module 5 corresponds with the final peer-to-peers IVC, please expect to spend 1-2 class periods on debriefing, reflection and evaluation work after the final IVC.

Background

Climate Change is a major problem, but positive change can be made at a small, local level. Individuals have power in the future of our environment.

Module Objectives

- Understand the efforts, challenges and outcomes of national/int'l environmental policies.
- Understand that there is no one solution to climate change and one perfect energy source
- Conclude the collaborative project by completing Milestone Four: Finalize and Share.

	Activity	Page	Estimated Time
LEARN	Beyond Fossil Fuels	70-73	60 minutes
ACT	Milestone 4: Final Product	74-75	60 minutes in-class planning 45-60 minutes additional preparation (outside of class)
	IVC #5	76-77	30 minutes preparation 60 minute IVC + 30 min. dial-in
Reflect	Debriefing Conversation	78	15 minutes
Program Evaluation and Debrief	Student and Educator Online Surveys	Online	60 minutes

LEARN

Beyond Fossil Fuels	
TIME: 60 minutes	MATERIALS: Computer with Internet Access, Debate Format (p 72), Graphic Organizer (p 73)
KEY VOCABULARY <i>fossil fuels, solar energy, nuclear power, wind energy, tidal energy, geothermal energy</i>	
OVERVIEW Students prepare to engage in a debate on sustainable energy and learn about sustainable energy alternatives as a means to combat the effects of climate change.	
INSTRUCTIONS <ol style="list-style-type: none"> Select a topic: Students identify a type of sustainable energy (<i>fossil fuels, solar energy, nuclear power, wind energy, tidal energy, geothermal energy</i>) to learn more about and explore through a debate. The issue should impact them and their partner school's country. Create a Debate Prompt: Students write a debate prompt on the topic. This should be an <u>opinion statement</u>, meaning that it can be argued and there is no right answer. The prompt should have more than two potential perspectives or answers. <i>Sample Debate Prompt:</i> Solar Energy is a solution to the world's growing appetite for energy sources while having minimal impact on the environment. Define Debate Positions: As a class, brainstorm 2-4 positions on the debate prompt. Each will serve as the main argument of one group or side in the debate, like a thesis statement would lead an essay. The position should directly respond to the prompt and be argued with the support of concrete evidence. <i>*Students should consider perspectives from all sides of the debate.</i> Research and Prepare Your Positions: Divide the class into groups, one for each debate position (ideally 4-6 students per group). Students take on perspectives different than their own. Students work in groups to research their topic, define arguments for their position, and find evidence supporting arguments. 	
Students use the <u>Debate Graphic Organizer</u> (p. 73) to prepare three arguments supporting each position. Each argument should include 2-3 pieces of evidence, quotes, or perspective from academic or media resources. Students spend 5-10 minutes after researching to clarify the group's position on the debate prompt, and prepare three arguments and evidence. Students will prepare as a team, but should designate one student as a "lead speaker" to present opening and closing arguments. Other students in the group should be prepared to present specific arguments and evidence, and rebut other group's positions.	Debate Components Opening Statement: An opening statement presents your position and gives a brief overview of the main argument. This is your first chance to engage your audience, be should be assertive and confident. Rebuttal: Rebuttal statements use critical thinking to challenge other debaters' claims. Rebuttals may <i>refute</i> an argument, or prove that it is incorrect, by identifying flaws in the evidence or assumptions. Rebuttals can also acknowledge the valid elements of the other side's perspective, but then provide a counter argument that is stronger and more important than the original statement. Challenging: When a debater is presenting, other groups may challenge, or present a question or statement aimed to provide information to the audience or contest the speaker's point with a counter argument.

- 5. Debate!** Students engage in a 20-30 minute debate on their prompt, using their research and well-crafted arguments. Use the format on the next page to guide the debate.

An educator or student should moderate the debate, to ensure that groups follow time limits and ask questions respectfully.²³

POST-DEBATE REFLECTION:

1. **Group Discussion:** As a class, reflect upon the debate in a group discussion.
 - What did you learn from other groups in the debate?
 - What was it like to argue a position that wasn't the same as your own view?
 - Did your opinions about this issue change? If so, how? If not, why?
2. **Share:** After the debate, have each group share the following on the online platform:
 - Their "position" and three supporting arguments.
 - What they learned from the debate and how their opinions changed.

View: Have students view the partner school's opinions on the debate and compose 2-3 questions or comments to share during the IVC.

²³ Rebuttal argument definition based off of Pearson resources at http://wps.ablongman.com/long_faigley_grca_3/43/11074/2835168.cw/index.html.

<p>DEBATE FORMAT (20-30 minutes)</p>
<p>OPENING STATEMENTS: 1 minute per team</p> <p>Each team (up to 4) presents their opening statement, which includes their position on the debate prompt and an overview of their main arguments.</p>
<p>ARGUMENT and EVIDENCE ROUNDS: 5-7 minutes per team</p> <p>Each team (up to 4) has the opportunity to present their three main arguments and supporting evidence, followed by an opportunity for other teams to challenge, and concludes with a rebuttal. There will be as many rounds as there are teams.</p>
<p>1. The team presents its 3 main arguments and supporting evidence (2-3 minutes).</p>
<p>2. Opportunity to challenge*: Other groups ask any clarifying questions or challenge the presented arguments (1 minute).</p> <p><i>*Students may challenge only once per round, to encourage as many students to participate in the activity as possible.</i></p>
<p>3. Rebuttal: The presenting team has the opportunity to defend its position and clarify arguments (2-3 minutes).</p>
<p>CONCLUDING STATEMENTS: 2 minutes per team</p> <p>Each team (up to 4) has a final opportunity to argue for their position. The closing statement should recap the team's position and argument, while answering any lingering questions that were not answered during the rebuttal. As the last statement of their position, speakers should be persuasive and confident.</p>

Debate Graphic Organizer

Debate Prompt:

Group Position:

Arguments Supporting Position	Evidence from Media and Academic Resources <i>(Sources could include websites, newspaper, articles, video, etc.)</i>
Argument 1:	1. 2. 3.
Argument 2:	1. 2. 3.
Argument 3:	1. 2. 3.

POST-DEBATE:

What new perspectives did I learn about from my research or other group's arguments?

-
-
-

Did my opinion change, based on reflections from the debate, research, and prior knowledge? How?

ACT

Milestone 4**Final Product & Sharing****TIME**

60 minute in-class planning
60 - 75 minutes additional preparation (outside of class if needed)

MATERIALS

Project Guide, pgs. 15 – 16 Feedback Guide, p. 17
“Call to Action” Worksheet, p. 63

OVERVIEW

In this final collaborative project activity, students incorporate feedback from the rough draft, gather any additional content needed, and finish the creation of the final product. Then, students implement a distribution plan to share with multiple audiences.

INSTRUCTIONS

1. **Reflect and Revise:** Based on feedback from their rough draft, direct students to their Project Guide (pgs. 15 - 16), asking and answering the following and updating the Project Guide and Activity and Materials Chart (Part D) accordingly:
 - a. Review your “Need to Know” list (Milestone 1). What have you learned and what do you still need to know to complete your project? Are there new questions or subjects that you need to investigate?
 - b. Is your project addressing all six elements of a successful project according to the Criteria Wheel (p. 11)? If not, what elements of your project still need to be addressed to ensure your project is meeting the relevant criteria.
2. **Finalize the Product:** Based on feedback from peers on the rough draft of your project, and any additional content gathered, have students move forward with creation of the final product of their project. Students should be able to answer the following upon completion of the project:
 - a. How does your project address your target audience and their needs and/or interests?
 - b. How does your project answer the DQ?
3. **Craft a Distribution Plan:** Based on target audience (Project Guide, Part B) complete the “Call to Action” planning worksheet to identify where and how to share your project with your target audience.
4. **Keep Going!:** You have completed your final product, but make sure to share it with multiple audiences beyond your partner group! Share in local events, online, and more!

4. Finalize & Share
Share Final Project that Answers DQ

CONGRATULATIONS!

✓ Milestone 4 and your collaborative project are complete!

“Call to Action” Planning Guide

3

WHO:

- ✓ Who is the target audience? (Hint: See Project Guide, Part B: Target Audience)

4

WHY:

- ✓ Why is this an important target audience?

4

HOW:

- ✓ How will we engage this audience? (i.e. in what format? Film screening, art showcase, poetry reading, food festival)
- ✓ Where will we hold this event?
- ✓ On what day and time should we plan this event? Is this the best time to engage our target audience?
- ✓ How will we advertise our event to our target audience?

IVC #5 Preparation and Outline	
TIME IVC Preparation – 1 class period (before IVC) IVC Outline – 90 minutes (including dial-in)	MATERIALS IVC #5 Preparation Outline
OVERVIEW The outline below will be used as a guide for discussion during the final IVC. Students should review this outline and provide appropriate responses in all text boxes prior to the final IVC.	

I. LEARN: Debate Recap (25 minutes)

Students will reflect upon their exploration of multiple perspectives in their foreign relations debate, and learn about main arguments and evidence of their peers' debate topic and positions. Present the main arguments of your debate, and share how your perspectives changed. After viewing your peers' posts, record three questions for your peers on their debate topic, perspectives, or evidence. *Remember that, like you, your peers may be presenting perspectives different than what they personally believe!*

Select 2-4 class representatives to share their debate group's position, their most interesting piece of evidence, and one thing they learned from the debate.

Group Position:

Compelling Evidence:

What I Learned:

After viewing your peers' debate positions and evidence, record three questions to ask in the IVC.

-
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II. ACT: Milestone 4: Final Product & Sharing (30 minutes)

Students share their completed Collaborative Project with their partner school. Introduce your project, discuss its significance to your community, any challenges or triumphs in completing the project, and your “Call to Action” distribution plan.

- Name of Representative; Introduction of Project
- Name of Representative; Explanation of Project’s Significance
- Name of Representative; Explanation of Challenges or Triumphs

“Call to Action” Distribution Plan:

Comments for Your Peers:

III. 60-Second Showcase! (10 minutes)

Any students who have not yet shared their talents with their peers will have the opportunity to do so in this final IVC.

- Name of Representative:
- Name of Representative:
- Name of Representative:

IV. Culminating Discussion (20 minutes)

This is the final IVC meeting. Reflecting on the module topics and your experiences to date, record any final questions for your peers.

V. Conclusion (7 minutes)

GNG facilitator thanks all students and teachers for participating, reminds students to remain connected through the online platform, and invites all to join the GCA alumni network! Select one student representative to express final “thank you and goodbye” remarks on behalf of the class.

Name of Representative; Final Remarks:

REFLECT

IVC #5 Debriefing Conversation

TIME

15 minutes

(Either immediately following or shortly after IVC)

MATERIALS

Pen, paper, internet access to online platform

OVERVIEW

Engage your students in a short reflective conversation on their experiences to date. Complete the online educator feedback survey with your students' reflections in mind.

INSTRUCTIONS

1. REFLECT on your Conversation:

- Did you realize anything new about yourself and your own ability to engage others?
- Do you feel like an environmental leader?
- How was the process of completing your collaborative project? Did you face any unanticipated challenges? If so, are you content with how you and your peers overcame them?
- How do you feel about engaging a wider audience around the issue addressed in your project?

2. CONNECT on the Online Platform:

EDUCATOR FEEDBACK SURVEY:

Following each IVC, educators are encouraged to complete the "Educator Feedback Survey." The survey should not take more than 10 minutes to complete, and will be e-mailed directly to educators immediately following the IVC.

Following this final IVC only, both educators and students will also need to complete online surveys and participate in an interview or focus group discussion, if requested. Please allocate 45 – 60 minutes to complete the End of Program evaluation process.