

CCPS Science Unit Plan

Grade	9	Subject	Science	Unit #	4
Unit Name	Environmental Concerns		Timeline	5 weeks	
How to use the Framework	<p style="color: red;">This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards. Please see the hyperlinked abbreviation document to ensure understanding all abbreviations used with this framework.</p>				
Unit Overview	<p>In this unit, we will delve into the pressing issues surrounding human population growth and its direct impact on the environment. We will investigate how sustainability plays a crucial role in maintaining the delicate balance of organism survival, land use, water consumption, and atmospheric conditions. Another essential concept we will explore is the human ecological footprint, which highlights the magnitude of our impact on the environment and the urgent need for sustainable practices to ensure a harmonious coexistence with our planet.</p>				
Lesson Plan guidance document and template	CCPS Lesson Plan Template Day View Lesson Plan Template Week View Department of Science Guidance Document				
3Dimensional Instruction	<u>GSE</u>	<u>Science and Engineering Practices</u>	<u>Crosscutting Concepts</u>		
	<p>SEV4. Obtain, evaluate, and communicate information to analyze human impact on natural resources.</p> <p>a. Construct and revise a claim based on evidence on the effects of human activities on natural resources.</p> <p>b. Design, evaluate, and refine solutions to reduce human impact on the environment including, but not limited to, smog, ozone depletion, urbanization, and ocean acidification.</p> <p>c. Construct an argument to evaluate how human population growth affects food demand and food supply (GMOs, monocultures, desertification, Green Revolution).</p> <p>SEV5. Obtain, evaluate, and communicate information about the effects of human population growth on global ecosystems.</p>	<ul style="list-style-type: none"> ● Obtaining, Evaluating, and Communicating Information ● Constructing Explanations and Designing Solutions ● Analyzing and Interpreting Data 	<ul style="list-style-type: none"> ● Cause and Effect ● Patterns 		

	<p>a. Construct explanations about the relationship between the quality of life and human impact on the environment in terms of population growth, education, and gross national product.</p> <p>b. Analyze and interpret data on global patterns of population growth (fertility and mortality rates) and demographic transitions in developing and developed countries.</p> <p>c. Construct an argument from evidence regarding the ecological effects of human innovations (Agricultural, Industrial, Medical, and Technological Revolutions) on global ecosystems.</p> <p>d. Design and defend a sustainability plan to reduce your individual contribution to environmental impacts, taking into account how market forces and societal demands (including political, legal, social, and economic) influence personal choices.</p>		
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NGSS Alignment

[NGSS Alignment to Disciplinary Core Ideas](#)

Weekly Lesson Tasks

Week 1

GSE:
SEV5a. *Construct explanations about the relationship between the quality of life and human impact on the environment in terms of population growth, education, and gross national product. (Day 1 & 2)*
SEV5b. *Analyze and interpret data on global patterns of population growth (fertility and mortality rates) and demographic transitions in developing and developed countries. (Day 3)*
SEV4a. *Construct and revise a claim based on evidence on the effects of human activities on natural resources. (Day 4 & 5)*

Focused Concept:
Human Population Growth
Age Structure
Demographic Transition
Tragedy of the Commons
Sustainability

Phenomenon: Daily phenomena are found in the Opening.		DQ: Daily guiding questions are found in the Opening.			
SEP: Construct an Explanation & Analyzing and Interpreting Data		CCC: Cause & Effect; Stability & Change			
	Day 1	Day 2	Day 3	Day 4	Day 5
Learning Target	<i>I CAN...Analyze textual information to explain factors that affect population growth.</i>	<i>I CAN...Analyze data to discuss the relationship between certain factors and population growth.</i>	<i>I CAN...Model how population demographics change over time.</i>	<i>I CAN...Explain the concept of the tragedy of the commons.</i>	<i>I CAN...Communicate the concept of sustainability.</i>
Opening	<p>World Population Clock</p> <p>GQ: <i>How Many People Can Earth Support?</i></p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • population • population growth • birth/natality • death/mortality • immigration • emigration • migration • Total Fertility Rate • Infant Mortality Rate • developing country • developed country 	<p>China's One-Child Policy</p> <p>GQ: <i>What role does a government play in population growth?</i></p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • age structure • demographer • sex ratio 	<p>Developed vs. Developing</p> <p>GQ: <i>How do demographers monitor population changes?</i></p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • demographer • crude birth rate • crude death rate • demographic transition 	<p>Which Way to Go?</p> <p>GQ: <i>How does human population growth impact our natural resources?</i></p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • commons • natural resource • deplete • anthropogenic • Tragedy of the Commons 	<p>Wake Up and Smell the Coffee</p> <p>GQ: <i>Are you a good steward of your environment?</i></p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • sustainability • steward • natural resource • commons • anthropogenic • Tragedy of the Commons
Guided Practice/ Transition	<p>Where do you stand?</p> <p>TTW: Place the “Strongly Agree,” “Agree,” “???”, “Disagree” or “Strongly Disagree” signs around the room, and explain that students are to stand at the appropriate sign based on the given statement/question.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Where do you stand? PowerPoint • Where do you 	<p>Age Structure Lecture</p> <p>TTW: Explain via lecture what age structures are, their purpose, and how to relate them to population growth trends</p> <p>Materials:</p> <ul style="list-style-type: none"> • Age Structure PowerPoint • Power of the Pyramid Activity (<i>This graphing activity can be done if there is</i> 	<p>Modeling Demographic Transition</p> <p>TTW: Discuss the concept of demographic transition via whole-group discussion from the model activity. *Students will complete the model activity before the content is presented. Students will discuss how and why they arranged the demographic descriptors, and the instructor will guide them in corrective thinking if they are wrong.</p>	<p>Tragedy of the Commons</p> <p>TTW: Model how students will work in groups to model the tragedy of the commons. Students will complete the activity before any idea of the concept is explained (PowerPoint below).</p> <p>Materials:</p> <ul style="list-style-type: none"> • Tragedy of the Commons Activity • Tragedy of the Commons 	<p>The Lorax - Story Time</p> <p>TTW: Read the Original Lorax to the whole group. Then, the teacher will explain how students will go through the text within their groups to identify the commons found within the story and how they were affected by it. The instructor will then lead them in a discussion about sustainability by asking, “Was the Oncelers' idea all bad?” “How could he be a better</p>

	<p>stand? Teacher Guidance (You can use alternative questions found in the guidance document).</p> <ul style="list-style-type: none"> Designated signs found in Guidance document <p>Note: Be sure to set expectations for student behavior and discussion during this time.</p> <p>Population Growth Mini Lecture</p> <p>TTW: Explain the factors that influence population growth using the presentation. Students are to take notes during this time.</p> <p>Materials:</p> <ul style="list-style-type: none"> Population Growth PowerPoint Paper or Notebook Writing Utensils <p>Textbook Reference: 14.1 pgs 465-466; 14.2 pgs 467-472</p>	<p>time. Be sure to allow students to graph before the lecture.)</p> <ul style="list-style-type: none"> Paper or Notebook Writing Utensils <p>Textbook Reference: 14.2 pgs 467-472</p>	<p>Students will make corrections and then take notes.</p> <p>Materials:</p> <ul style="list-style-type: none"> Demographic Transition Model PowerPoint DTM Instruction Cards Chalk Markers (Lab Tables) or Expo Markers for Desk (Chart Paper can be used) Yarn (Yellow, Blue, and Red) <p>Textbook Reference: 14.2 pgs 467-472</p>	<p>PowerPoint / Video</p> <ul style="list-style-type: none"> Goldfish Crackers Paper Bowls Straws (Alternatives could include spoons, chopsticks, tweezers, etc) 	<p>steward of his environment?" "What does it mean to be a good steward?"</p> <p>Materials:</p> <ul style="list-style-type: none"> The Lorax Story Book Sustainability PowerPoint Student Chromebooks
<p>Independent Practice</p>	<p>Factors that Influence Human Population</p> <p>TSW: Use pages 467-468 to create a table that analyzes the differences between developed (more developed) and developing (less developed) countries for each factor affecting birth, total fertility, and death rates. Students will then partner up and discuss and explain how they use the textual information to categorize accordingly (compare).</p>	<p>Population Simulator</p> <p>TSW: Work in their cooperative groups to manipulate the population simulator for their designated country or region. Students will adjust the many variables and determine their effect on the population's diagram and population growth. Students will take note of trends they notice. Have students research Gross Domestic Product (GDP) and identify the GDP for their country/region. Groups will compile this information in a PowerPoint to share.</p>	<p>Modeling Demographic Transition</p> <p>TSW: Work in their cooperative groups to model demographic transition using their prior knowledge and scientific reasoning. Students will create models using their lab tables/desks (or chart paper). Students will then rotate around the room to compare other group's Demographic Transition Models.</p>	<p>Tragedy of the Commons</p> <p>TSW: Work in their cooperative groups to fish the goldfish resources out of the model pond to explore how resources are impacted when available to any and everyone. Students will then work together to address the analysis/ concluding questions.</p>	<p>The Lorax</p> <p>TSW: Independently communicate the concept of sustainability by supporting a claim as an Environmental advisor about the Onceler's plan for the Thneed Factory. Students will either agree to operating the Thneed Factory, disagree with operating the Thneed Factory, or Agree with provisions. Their claim must be supported with evidence. Students are allowed to research evidence to support their claim/position and must speak to sustainability.</p>

		Population Simulator			<p>Materials:</p> <ul style="list-style-type: none"> • The Lorax Sustainability Assignment & Rubric • Student Chromebooks • Paper • Writing Utensil
Assessment Summary	<p>Recent Trends in the Human Population.</p> <p>The teacher and students will read recent trends in the Human Population whole group on page 465. The teacher will then display the graph/data on page 465 and ask: O the three recent trends discussed in the text, which are represented in the figure, and explain. Students will then suggest some possible causes of this trend. This can be done using chart paper, sticky notes, or an available whiteboard.</p>	<p>Generations in the United States <i>(Suggested Canvas Discussion Post)</i></p> <p>The teacher will guide students in a discussion in the different generations (Reference Science Talk in the text; pg 469) in the United States and then have students address the following prompts:</p> <ul style="list-style-type: none"> • Why will Generation Xers eventually surpass Baby Boomers? • The generations that will remain in and represent the workforces for the next 20-40 years are ___ because... • Immigration can impact any generation by... 	<p>Alphabet Soup</p> <p>You will be assigned a letter of the alphabet. You must come up with a word that begins with that letter and relates to the current topic (Demographic Transition). You must explain. You must explain how the word relate/ meaning of the word.</p> <p><i>Suggestion: You can have students use a random letter generator.</i></p>	<p>Got Coffee?</p> <p>Students will engage in a general discussion about their personal coffee consumption, preferences, and any possible environmental implications.</p>	<p>Three Seconds</p> <p>Students will watch the clip “Three Seconds” and discuss whether they consider themselves good stewards of their environment. They will then discuss with a partner how they can live a more sustainable life (be sure that they focus on what they can control).</p> <p>SUGGESTED ASSESSMENT DAY</p>
Small Group Tasks (TBA)					

Week 2

GSE:
SEV5c. Construct an argument from evidence regarding the ecological effects of human innovations (Agricultural,

Focused Concept:
Dust Bowl - Desertification
Impact of Human Innovation on the Environment

Industrial, Medical, and Technological Revolutions) on global ecosystems. (Day 6 & 7)
SEV4c. Construct an argument to evaluate how human population growth affects food demand and food supply (GMOs, monocultures, desertification, Green Revolution). (Day 8-10)

**Biomagnification
Pesticides & Pest Management**

Phenomenon: Daily [phenomena](#) are found in the Opening.

DQ: Daily guiding questions are found in the Opening.

SEP: Construct Explanations & Designing Solutions; Engaging in Argument from Evidence

CCC: Cause & Effect; Stability & Change

	Day 6	Day 7	Day 8	Day 9	Day 10
Learning Target	<i>I CAN...Analyze information to create an argument of how human innovation has negatively affected the environment.</i>	<i>I CAN...Communicate, through creative storytelling, an argument of how human innovation has negatively affected the environment</i>	<i>I CAN...Analyze information to identify advantages and disadvantages of various agricultural techniques.</i>	<i>I CAN...Model and investigate the impact of biomagnification within food chains.</i>	<i>I CAN...Design an integrated pest management plan for a garden.</i>
Opening	<p><u>The Dust Bowl</u></p> <p>GQ: How has human innovation negatively affected the environment?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • agricultural revolution • desertification • technological revolution • medical revolution • industrial revolution • negative externalities • innovation 	<p><u>How to tell the Story</u></p> <p>GQ: How has human innovation negatively affected the environment?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • population growth • agricultural revolution • technological revolution • medical revolution • industrial revolution • negative externalities • innovation 	<p><u>Feeding the World - I²</u></p> <p>GQ: How and why has agriculture changed over time?</p> <p>TTW: Show the phenomenon and engage students in data analysis via the I² method. Use the reference sheets below.</p> <p><u>Feeding the World I² Worksheet</u></p> <p><u>I² Reference Sheet</u></p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • genetically modified organisms (GMO) • pesticides • monoculture • Green Revolution 	<p><u>DDT</u></p> <p>GQ: Should expecting mothers eat fish?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • biomagnification • bioaccumulation • persistent organic pollutants (POP's) 	<p><u>Pest Control</u></p> <p>GQ: How can society manage agricultural pests more sustainably?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> • pest • pesticides • synthetic pesticides • chemical pest control • biological pest control • physical/mechanical pest control • cultural pest control • integrated pest management (IPM)
Guided Practice/Transition	Innovations: A Series of Unfortunate Events (A STEM Lesson)	Innovations: A Series of Unfortunate Events (A STEM Lesson)	Green Revolution Mini Lecture	Silent Spring - DDT TTW: Display figure 7-14 on	Pesticide Mini Lecture TTW: Use the presentation to

	<p>TTW: Place students in cooperative groups and assign them a revolution (medical, agriculture, technological, industrial). The teacher will then explain how students will undergo research of these revolutions.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Teacher can provide articles for students if necessary • Chromebook/ Access to internet • White Dry Erase boards 	<p>TTW: The teacher will model how students will go around to each argument board to look at each group's argument based on the revolution. Students will leave any feedback or questions for the group's argument. The teacher will then facilitate discussion based feedback and questions of peers. Students will address the concerns while the teacher clarifies any misconceptions. This may be an opportunity for a mini-lecture.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Chart Paper • White Dry Erase Boards (Day 2) • Chromebook/ Access to internet • Access to Google Slides, Book Creator, Canva • Construction paper • Cardboard • Copy Paper • Color pencils, crayons, or markers • Yarn • Hole puncher • stapler • Whatever other materials students see fit 	<p>TTW: Explain the concept of the Green Revolution to introduce the idea of monocultures, pesticides, and genetically modified organisms (GMO's). The instructor will use the presentation to show the connection to human population growth and need and how this was a catalyst for the green revolution. Students will create their own graphic organizer to identify the grows and glows of the many components (monocultures, pesticides, and GMO's) of the Green Revolution. (Feel free to create a T-chart for those students who may need support).</p> <p>Materials:</p> <ul style="list-style-type: none"> • Feeding the World - The Green Revolution PowerPoint • Paper • Writing Utensil • Graphic Organizer (T-chart). <p><i>Textbook Reference: 9.2 pgs 282-293</i></p>	<p>page 222 of the textbook and ask students to choose one statement that best summarizes the information in the graphic. The teacher will then show the clip of Rachel Carson Author of "Silent Spring" discussing what students what they modeled during the lab activity. Be sure to reference the main vocabulary terms, bioaccumulation, persistent organic pollutants, biomagnification.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Rachel Carson "Silent Spring" Author • Paper • TE Environmental Textbook pg 222 (Reference <i>Art in Science</i> and <i>Interpret Visuals</i>) <p><i>Textbook Reference: 7.2 pgs 221-222</i></p>	<p>explain the categories of pest control and how integrated pest management provides sustainability.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Pest Control & Integrated Pest Management Presentation <p><i>Textbook Reference: 9.4 pgs 303-306</i></p>
<p>Independent Practice</p>	<p>Innovations: A Series of Unfortunate Events <i>(A STEM Lesson)</i></p> <p>TSW: Work in their groups to research their assigned revolution and identify the following:</p> <ul style="list-style-type: none"> - Cause of revolution - Inventions or innovations of that time 	<p>Innovations: A Series of Unfortunate Events <i>(A STEM Lesson)</i></p> <p>TSW: Design a children's book to narrate their argument on how innovations have negatively impacted the environment. The narrative must include illustrations and the following</p>	<p>Land-Based Agriculture</p> <p>TSW: Work with a partner to assess the different land-based agricultural techniques in their textbook. In their notes students will list the advantages and disadvantages of each type. Students will how each type impacts biodiversity.</p>	<p>Biomagnification Lab</p> <p>TSW: Work in their cooperative groups to model biomagnification using the materials and lab document below. Before beginning the activity have students write down the definition of the vocabulary words in their notes/notebooks. At the</p>	<p>What's Your IPM?</p> <p>TSW: Work in their cooperative groups to create an Integrated Pest Management Plan based on their garden.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Garden IPM Guideline

	<ul style="list-style-type: none"> - Benefits of inventions - Negative environmental impact of those inventions 	<p>information:</p> <ul style="list-style-type: none"> -Describe their Revolution/How it began -Innovations during that time and their benefits -Issues or negative externalities/impact on the environment. <p>Students' products must be creative and can include a digital book, a digital book with audio, hardback book, paperback book, pop up book (the choice is the student's).</p>	<p>Student pairs will then discuss with another pair which type of agriculture students think is most advantageous in terms of the environment & sustainability, economics and social issues. Students will present their positions in the form of a discussion post in Canvas. Students must provide feedback or respond to at least two other groups' discussion posts.</p> <p><i>Textbook Reference: 9.2 pgs 282-283</i></p>	<p>completion of the activity students will answer the lab analysis questions.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Biomagnification Lab Activity • Various Colors of Paper Clips (see lab instructions) • Dice <p><i>Note: If you do not have paper clips this can be modeled using chalk markers on table tops or on chart paper with flip chart markers.</i></p> <p><i>Textbook Reference: 7.2 pgs 221-222</i></p>	<ul style="list-style-type: none"> • Chromebook • Access to Internet
Assessment/Summary	<p>Claim-Evidence-Reasoning (CER)</p> <p>Students will use white boards to construct their argument of the impact of human innovation on the environment using the CER model.</p>	<p>Story Time</p> <p>Students share/present their story to their peers and the teacher will assess their product using a rubric.</p>	<p>3-2-1</p> <p>Students will summarize their learning use the 3-2-1 method:</p> <p>3- THREE things that you learned. 2- TWO things you found interesting. 1- ONE thing you still question.</p>	<p>Dealing with Pest</p> <p>Students will share their own experiences with pests found in their home, yard, garden, or other. Students can use the following prompts</p> <ul style="list-style-type: none"> - My experience with a pest or pests happened when... - The way I (or my family) dealt with pests was... - This method was successful/unsuccessful in that... - This method impacted the environment negatively/positively/ neutrally because... 	<p>Concept Map</p> <p>Students will be presented with 4 concepts from the lesson (ie pest, pesticide, integrated pest management, pest control). Each concept will be written on a piece of flipchart paper. Student groups will be given 30 seconds to a minute to add nodes to the concept map, before rotating to the next concept. Be sure each group interacts with each concept, and note they can do multiple rounds if time permits.</p>
Small Group Tasks (TBA)					

GSE:
SEV4c. Construct an argument to evaluate how human population growth affects food demand and food supply (GMOs, monocultures, desertification, Green Revolution). **(Day 11)**
SEV4a. Construct and revise a claim based on evidence on the effects of human activities on natural resources. **(Day 14)**
SEV4b. Design, evaluate, and refine solutions to reduce human impact on the environment including, but not limited to, smog, ozone depletion, urbanization, and ocean acidification. **(Day 12, 13, 15)**

Focused Concept:
GMOs
Urbanization
Water Use
Water Pollution
Eutrophication
Watershed

Phenomenon: Daily [phenomena](#) are found in the Opening.

DQ: Daily guiding questions are found in the Opening.

SEP: Engaging in Argument from Evidence; Construct Explanations & Designing Solutions

CCC: Cause & Effect; Stability & Change

	Day 11	Day 12	Day 13	Day 14		Day 15
Learning Target	<i>I CAN...Creatively communicate advantages and disadvantages of Genetically Modified Organisms in Agriculture.</i>	<i>I CAN...Analyze and communicate urbanization trends of major US Cities.</i>	<i>I CAN...Develop and design a green city that mitigates the impact of urbanization.</i>	<i>I CAN...Evaluate their use of water and create a poster to show the impact of such usage.</i>		<i>I CAN...Investigate the water quality of the Mississippi River Watershed.</i>
Opening	<p><u>Maize</u></p> <p>GQ: What are the advantages and disadvantages of genetically modified organisms with food sources?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> genetically modified organisms 	<p><u>Atlanta: Then & Now</u></p> <p>GQ: What are the Effects of Urbanization on the Environment?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> urbanization urban sprawl food deserts 	<p><u>Trends of Urban Sprawl</u></p> <p>GQ: How can cities become more sustainable?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> eco-city/green city urban planning 	<p><u>Water Main Break</u></p> <p>How does population growth & urbanization impact our waterways?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> water footprint virtual water potable water freshwater ground water surface water aquifer 		<p><u>Eutrophication</u></p> <p>GQ: How do we assess the health of waterways?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> watershed fertilizer/nutrient runoff nitrogen phosphorus eutrophication

	<ul style="list-style-type: none"> (GMOs) artificial selection 			<ul style="list-style-type: none"> grey water waste water black water point source pollution nonpoint source pollution 		<ul style="list-style-type: none"> pH temperature dissolved oxygen (DO) turbidity
Guided Practice/Transition	<p>Mexico vs. The United States: A Maize Dispute</p> <p>TTW: Engage students with a news clip that highlights the dispute between Mexico in the United States. The instructor will then explain how students will work with a partner for 15 minutes to read various articles (students can conduct their own research). Students will then write down key ideas for whole group discussion about their viewpoint on the dispute. The instructor will then review some of the advantages and disadvantages of GMOs. Be sure to discuss the difference between GMOs and artificial selection.</p> <p>Materials:</p> <ul style="list-style-type: none"> Mexico GMO Corn Dispute Video Clip Mexico is treating corn as a threat. Here is why... (Article) Transgenic corn found growing in Mexico (Article) Amazing Maize: First Cultivated in Oaxaca (Article) Feeding the World-GMOs 	<p>Green City <i>(A STEM Lesson)</i></p> <p>TTW: Describe urbanization and urban sprawl and how that leads to food deserts. There will be discussion of possible solutions based on students research (share out) conducted during the independent practice.</p> <p>Materials:</p> <ul style="list-style-type: none"> Teacher can provide articles for students if necessary Chromebook/ Access to internet White Dry Erase boards <p><i>Textbook Reference: 14.3 pgs 472-478</i></p>	<p>Green City <i>(A STEM Lesson)</i></p> <p>TTW: Select two student volunteers to serve as recorders. The teacher will engage students in a video of the most sustainable cities. As the video plays the student recorders will note on the boards the solutions used by these major cities in producing more green cities. At the conclusion we will discuss any that may have been missed (students make note as well in their notes). The teacher will then present them with a scenario.</p> <p>Materials:</p> <ul style="list-style-type: none"> What is the most sustainable city in the World? Video Clip Green City Scenario White Board Expo Markers <p><i>Textbook Reference: 14.4 pgs 478-484</i></p> <p><i>Suggestion: This may be a great day to invite the local city planner into your classroom as students begin to plan and build their Green Cities. Have them speak to the students about their role</i></p>	<p>Water Footprint</p> <p>TTW: Have each student individually take a water footprint test to assess their household's use of water. The teacher will have 3 corners in the classroom labeled using chart paper "Indoor Water", "Outdoor Water", and "Virtual Water". Based on the results students will go and stand next to the area in which they have the highest water usage. Have students then write down or illustrate how they can reduce the amount of water they use. If the majority of students are in the same area. Have them go back to their seats and jot it on a piece of scratch paper or copy paper (allow them to collaborate), and then they can tape it to the chart paper.</p> <p>Materials:</p> <ul style="list-style-type: none"> Water Calculator Chart Paper Flip Chart Markers <p>Global Water Usage</p> <p>TTW: Then have students assess data about global water usage by</p>	<p>Watershed Demonstration</p> <p>TTW: Engage students in a demonstration of how watersheds work. Explaining to students that we all live in a watershed. Ask students if they know what watershed they live in or standing in (Depending on the location of your school it will be Flint or Ocmulgee). The teacher will then explain the connection of population growth, agriculture, urbanization and how these impact our water sources. See presentation below. Note: Before student engage in the investigation discuss the variables used to test water quality (pH, temperature, dissolved oxygen, turbidity, nitrates)</p> <p>Materials:</p> <ul style="list-style-type: none"> Instructions for Watershed Demonstration Watersheds & Eutrophication (Slides 1-8) Tarp Food Coloring Controlled Water source (Multipurpose Sprayer) 	

	<ul style="list-style-type: none"> • Presentation Genetically Modified Foods and Their Pros And Cons Video Clip <p><i>Textbook Reference: 9.2 pgs 289-291</i></p>		<p><i>and how they consider environmental conditions when planning.</i></p>	<p>asking, “Why is it important to know your water footprint?”. “Why do we want to conserve water?”</p> <p>Materials:</p> <ul style="list-style-type: none"> • Global Water Usage <p><i>Textbook Reference: 10.1 pgs 323 - 325; 10.2 pgs 326 - 330; 10.3 pgs 330 - 334; 10.4 pgs 334 - 347</i></p>		<ul style="list-style-type: none"> • Objects to give your tarp varying elevations <p><i>Textbook Reference: 6.4 pgs 182-185</i></p>
<p>Independent Practice</p>	<p>GMO PSA</p> <p>TSW: Work with a partner to create a Public Service Announcement on one of the Top 10 GMO'd crops. Student pairs can speak to the advantages, disadvantages, or both. Students can use poster boards, any digital presentation, or create a video. Students can reference the GMO descriptor/guide below.</p> <p>Materials:</p> <ul style="list-style-type: none"> • GMO's grown & Sold in the US 	<p>Green City <i>(A STEM Lesson)</i></p> <p>TSW:Work in their cooperative groups to work on a given city (LA, New York, Phoenix, Houston, Charlotte, etc.) and research urbanization trends. Students will identify environmental and social issues associated with rapid urbanization. Students will then identify possible solutions to mitigate these issues associated with these challenges. Evidence and solutions must be specific to their assigned city.</p> <p>Materials: (Suggestions)</p> <ul style="list-style-type: none"> • Chart Paper • Flip Chart Markers • Individual White Boards • Expo Markers 	<p>Green City <i>(A STEM Lesson)</i></p> <p>TSW:Work in their groups to develop prototypes of eco-friendly or green cities of their local city and be able to defend and speak to how it will reduce environmental impact, and economical and social disparities (food deserts).</p> <p>Materials: (Suggestions)</p> <ul style="list-style-type: none"> • Tinkercad • 3D Printer • legos • paper • Cardboards <p><i>Note: This part of the lesson may take a little more time, so plan accordingly. Also note that students can use any material that may be available for their prototype.</i></p>	<p>Water Pollution</p> <p>TSW: Work in pairs to create a poster about their assigned cause of water pollution:</p> <ul style="list-style-type: none"> • Mining • Fertilizers from farming • Chemicals from factories • Oil spills • Sewage • Trash <p>Their posters should include 1. An illustration of their cause of water pollution. 2. How population growth & urbanization increases this cause. 3. What pollutants may be involved. 4. How this water pollution impacts the environment (health, ecosystem, wildlife)..</p>		<p>Water Quality Study: The Mississippi Watershed Pivot Interactive</p> <p>TSW:Work in pairs to complete the Water Quality Pivot Interactive. This activity will allow them to conduct water sampling along the Mississippi Watershed.</p> <p><i>Alternative Lab and/or Enrichment: If your school is located on or near a body of water, and you have water testing kits, students can take their own water samples. Students can compare the sample data to their actual data.</i></p> <p><i>Alternative Lab: Pond Ecosystem Gizmo</i></p>

		<ul style="list-style-type: none"> • Canva/PowerPoint/Google Slides • Possible Collaborative Document (Google Slide) 				
Assessment/Summary	<p>GM Food Labels - Debate</p> <p>Students will research the controversies of labeling GM foods in the United States. Students will then respond to the Debate Question, “Should companies be required to label foods that contain genetically modified ingredients?”.</p> <p>Reference <i>Science in Action</i> on page 291 of Teacher’s Edition.</p> <p>SUGGESTED ASSESSMENT DAY</p> <p><u>Suggested Homework:</u> Ecological Footprint Project Ecological Footprint Rubric</p> <p>Give students a couple of weeks to work on this project. Students should be presenting week 5. You may want to create a suggested timeline, so that students may complete in a timely fashion.</p>	<p>Urban Climate Change</p> <p>Students will use a padlet to respond to the following:</p> <p><i>How does urbanization influence climate change?</i></p> <p><u>Suggested Homework:</u> What are the Effects of Urbanization on the Environment? Cengage Textbook</p> <p>Have students Read 14.3 pgs 472-478 and complete the Assessment Questions. Have them answer 1 & 2 Cornell Styled in their notes. And create a discussion post for 3 & 4 in Canvas for students to address. Students must respond to at least 2 peers.</p>	<p>Green City Panel</p> <p>Students will present their designs to community panels to determine which green city is best fitting. The panel will hopefully include the local city planner, mayor, local homeowner, local business owner, environmental engineer. The panel will provide feedback and vote on the best Green City.</p> <p><i>Note: The panel can be composed of peers, other teachers, administration, parents, or community leaders.</i></p>	<p>Green City Recap</p> <p>Students will think back to their Green City design, and identify if their green city encourages sustainable water use. If not, have students think about ways to improve their design to reduce the city's water footprint. If it does have them explain how.</p> <p><u>Suggested Homework:</u> Water Contamination Handbook ONLY In Preparation of Day 16 Lesson</p>		<p>Ecological Tolerance: The Indicator (CER)</p> <p>The teacher will briefly discuss ecological tolerance using (slides 9 & 10) and then have student complete a CER (slides 11 & 12) to review indicator species and make the connection to how we impact living organisms within waterways.</p>
Small Group Tasks (TBA)						

Week 4

GSE:
SEV4a. Construct and revise a claim based on evidence on the effects of human activities on natural resources. **(Day 16-20)**
SEV4b. Design, evaluate, and refine solutions to reduce human impact on the environment including, but not limited to, smog, ozone depletion, urbanization, and ocean acidification. **(Day 16-20)**

Focused Concept:
Wastewater Treatment
Wetlands
Air Pollution
Thermal Inversion/Smog
Ozone Depletion

Phenomenon: Daily [phenomena](#) are found in the Opening.

DQ: Daily guiding questions are found in the Opening.

SEP: Engaging in Argument from Evidence; Construct Explanations & Designing Solutions

CCC: Cause & Effect; Stability & Change, Patterns

	Day 16	Day 17	Day 18	Day 19	Day 20
Learning Target	<i>I CAN...Investigate the source of disease in the water supply and design a solution to decontaminate the water supply.</i>	<i>I CAN...Design a wetland to model how they naturally filter pollutants from the ocean.</i>	<i>I CAN... Obtain information to communicate the major air pollutants and how they impact the environment.</i>	<i>I CAN...Design an efficient air filtration system that will reduce suspended particulate matter pollution.</i>	<i>I CAN...Model ozone depletion and investigate ways to remediate ozone destruction.</i>
Opening	<p>Sewage Discharge</p> <p>GQ: How can wastewater be treated?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol. Upon completion the teacher will show the news clip.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> wastewater treatment contamination disinfect filtration Legionnaires disease E. Coli 	<p>Natural Filtration</p> <p>GQs: What are some natural ways in which we filter/clean water? Why is this important?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> wetland filtration 	<p>Cloudy with a Chance of Smog</p> <p>GQ: What are the major air pollution problems?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> Carbon oxides Nitrogen Oxides Nitric Acid Sulfur Dioxide Sulfuric Acid Volatile Organic Compounds (VOCs) Thermal/temperature inversion 	<p>The Attack</p> <p>GQ: How does anthropogenic activity inadvertently put human health at risk?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> suspended particulate matter (SPM) Air Quality Index (AQI) 	<p>Holey Moley</p> <p>GQ: How can humans reverse ozone depletion?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> ozone chlorofluorocarbons (CFCs) hydrofluorocarbons (HFCs)

<p style="text-align: center;">Guided Practice/Transition</p>	<p style="text-align: center;">Chattahoochee Riverkeeper - Neighborhood Watch</p> <p>TTW: Model how students will access the Chattahoochee Riverkeeper website. Give students some time to explore the website and share their findings. The teacher will then direct students to the “Our Work” section, and then have them click on “Water Quality Monitoring”. Watch the “What is Neighborhood Watch?” video on this page as a whole group. Then have students click on “NWW database” and have student groups explore the data provided and have student identify correlating data trends and any discrepancies. Have student volunteers come up to the board and share their data observations for group discussion. You can use some guiding questions to support the discussion.</p> <p style="text-align: center;">Materials:</p> <ul style="list-style-type: none"> • Chattahoochee Riverkeeper Website • NWW Data Guiding Questions <p><i>Textbook Reference: 10.4 pgs 334-347</i></p>	<p style="text-align: center;">Okefenokee Conservation</p> <p>TTW: Explain how students will read the Okefenokee Conservation article from UGA. Students will identify how this natural Georgia Wetland has been impacted by human activity. Students groups will share and discuss (Have students take notes):</p> <ul style="list-style-type: none"> -Why are wetlands important? - How have humans impacted the Georgia wetlands? -Identify innovative solutions to protect GA wetlands. <p style="text-align: center;">Materials:</p> <ul style="list-style-type: none"> • Okefenokee Conservation - UGA • beach ball * <p><i>*Suggestion: To make this activity more engaging you can use a beach ball to randomly select groups to respond to discussion questions.</i></p> <p><i>Textbook Reference: 6.4 pgs 182-185</i></p>	<ul style="list-style-type: none"> • Smog <p style="text-align: center;">Thermal Inversion Demonstration</p> <p>TTW: Model thermal/temperature inversion to introduce the concept of smog and air pollution. The students will then be provided with the Top 5 Most polluted cities in the United States and the teacher will explain how they will use Google Maps to observe the landforms around the cities and identify why they believe these cities are more prone to smog. After the discussion, students identify other cities in the U.S. that have similar topography that could lead to thermal inversion. Reference “<i>Tech it Out</i>” on page 529 of the TE.</p> <p style="text-align: center;">Materials:</p> <ul style="list-style-type: none"> • Thermal Inversion Video Demonstration - Teacher Reference • red and blue food color • cold water & warm water • large glass or plastic container • long plastic tube <p><i>Textbook Reference: 16.1 pgs 525-535</i></p>	<p style="text-align: center;">Air Matters</p> <p>TTW: Explain the Air Quality index and how it can be used to determine respiratory health risk each day. Students will be encouraged to download the App. Have students observe the AQI for their local city. They can choose a city to compare and collect the AQI and temperature for several days, so students can analyze the relationship of temperature with air quality.</p> <p style="text-align: center;">Materials:</p> <ul style="list-style-type: none"> • Air Matters App • Air Quality Index Data Collection <p><i>Textbook Reference: 16.1 pgs 525-535</i></p>	<p style="text-align: center;">Why is Ozone important?</p> <p>TTW: Explain how students will read and annotate the lab introduction and answer the pre-laboratory questions. The instructor will then review the pre-lab questions of the whole group and review lab safety protocols.</p> <p style="text-align: center;">Materials:</p> <ul style="list-style-type: none"> • Modeling Ozone Lab Activity • hula hoops • toothpicks • marshmallows <p><i>*Substitutions can include gumdrops or play doh.</i></p> <p><i>Textbook Reference: 16.4 pgs 559-562</i></p>
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Independent Practice	Water Contamination STEM Case	Creating a Wetland	Air Pollution Gallery Walk	Filtering Air Pollution Lab Activity	Ozone Modeling Lab
	<p>TSW: Complete the Water Contamination STEM Case to investigate how wastewater is treated and what happens if not done properly. Students will submit STEM case answers independently, but are encouraged to partner up a peer to discuss their thinking. Have students diagram and label the wastewater treatment process in their notes based on their investigation, and compare with their partner.</p> <p><i>Note: The teacher can find or create a general wastewater treatment diagram for struggling students to reference.</i></p>	<p>TSW: Work in groups of 3 to design an efficient wetland. Students will compete to see if their coastline can withstand a hurricane, and prevent nutrients/pollutants from entering the ocean. Have students complete the watershed design before completing the Water Contamination STEM case.</p> <p>Materials:</p> <ul style="list-style-type: none"> ● Sponges cut into small pieces ● Rock/gravel (rinsed) ● pipe cleaners ● Molding Clay ● Popsicle sticks ● Food coloring ● Paint trays <p><i>Enrichment: Have students research coastal aquatic plants found in the Georgia coastal wetlands. And assign those to the materials above based on their function (Create a legend). Students have to be able to explain why they chose to identify the material as such (ie Spartina = pipe cleaner because the root system prevents soil erosion).</i></p>	<p>TSW: Work in their cooperative groups to create a poster on their assigned air pollutant. Students must include the name, characteristic, effects, an illustration, and solutions (how to reduce or mitigate). Air pollutants include:</p> <ul style="list-style-type: none"> - Carbon Oxides (CO, CO₂) - Nitrogen Oxides & Nitric Acid (NO, NO₂, HNO₃, N₂O) - Sulfur Dioxide & Sulfuric Acid (SO₂) - Particulates - Ozone (O₃) Be sure to address the misconception of ozone found on page 528 of the TE. - Volatile Organic Compounds (VOCs) <p>Students will then go around to the various posters to record the information in a 5 column graphic organizer with the required categories listed above</p> <p><u>Suggested Homework:</u> Catalytic Converter Discussion in Canvas Reference Science in Action on Pg 527 of the TE</p> <p>Share the background story on catalytic converters and pose the questions:</p> <ul style="list-style-type: none"> - Do you think this type of testing is 	<p>TSW: Work in their cooperative groups to design an air filter with the provided materials. Students will test and improve based on results. Students must be sure to read the criteria for their air filter design before beginning.</p> <p>Materials:</p> <ul style="list-style-type: none"> ● National Geographic Environmental Science Lab Manual TE (pgs 192 - 202) ● National Geographic Environmental Science Lab Manual SE 135-142 ● Required Lab Materials 	<p>TSW: Work in teams of 6 to complete the modeling ozone activity and collect data based on the simulation. The student will then create a graph based on the data and answer the analysis and concluding questions. Students are encouraged to take notes during the simulation.</p>

			<p>useful?</p> <ul style="list-style-type: none"> - Why might a state not require it? 		
Assessment/Summary	<p>Alphaboxes</p> <p>Write down all the terms that you can think of that begin with each of the letters in each box that relate to the topic “Wastewater”</p> <p>Alphabox Graphic Organizer</p>	<p>Pictionary Collage</p> <p>Using the term “Wetlands” students will draw a picture to represent the meaning and importance of the word on a piece of copy paper. The teacher will make a collage of the images.</p> <p style="text-align: center;">SUGGESTED ASSESSMENT DAY</p>	<p>So What?</p> <p>On chart paper, students will answer the prompt: <i>What takeaways from the lesson will be important to know in three years from now? Why?</i> The instructor can set up multiple chart paper or white boards around the room, so students won’t be crowded around one.</p>	<p>Summary</p> <p>Students will summarize their understanding of air pollution and how it inadvertently impacts human health. Students will also address the following question: <i>Should we only be concerned with air pollution that occurs outside? Why or why not.</i> The summary should be 5-7 sentences.</p> <p><u>Suggested Homework:</u> Sick Building Syndrome & Scavenger Hunt</p> <p>Students will be given a reference sheet (<i>textbook pg 532 can be used as well</i>) of different indoor air pollution, and students will identify some sources within their home and or at school. Students will then research Sick Building Syndrome and write a paragraph on what it is and why it would be important to get some fresh air or include air purifiers within a building.</p>	<p>Did it Close?</p> <p>Students will view the video clip Did it Close? and based on the video and textbook identify if we can and how we can reverse the effects of ozone depletion. Students will respond in a padlet. <i>* Be sure to create the padlet prior to class.</i></p> <p><u>Suggested Homework:</u> Ozone Modeling Lab Wrap Up Questions</p>
Small Group Tasks (TBA)					

GSE:
SEV4a. Construct and revise a claim based on evidence on the effects of human activities on natural resources. (Day 21-25)
SEV4b. Design, evaluate, and refine solutions to reduce human impact on the environment including, but not limited to, smog, ozone depletion, urbanization, and ocean acidification. (Day 21-25)
SEV5d. Design and defend a sustainability plan to reduce your individual contribution to environmental impacts, taking into account how market forces and societal demands (including political, legal, social, and economic) influence personal choices. (Day 21-25)

Focused Concept:
Glacier & Sea Ice Melt
Albedo
Urban Heat Island
Ocean Warming
Coral Bleaching
Ocean Acidification
Climate Change
Climate Justice

Phenomenon: Daily [phenomena](#) are found in the Opening.

DQ: Daily guiding questions are found in the Opening.

SEP: Engaging in Argument from Evidence; Construct Explanations & Designing Solutions

CCC: Cause & Effect; Stability & Change

	Day 21	Day 22	Day 23	Day 24	Day 25
Learning Objective	<i>I CAN...Design an individual sustainability plan and creatively communicate via a podcast.</i>	<i>I CAN...Design an individual sustainability plan and creatively communicate via a podcast.</i>	<i>I CAN...Design an individual sustainability plan and creatively communicate via a podcast.</i>	<i>I CAN...Design an individual sustainability plan and creatively communicate via a podcast.</i>	<i>I CAN...Design an individual sustainability plan and creatively communicate via a podcast.</i>
Opening	<p><u>Sea Levels on the Rise</u></p> <p>GQs: How do we know that anthropogenic activities are having an adverse effect on the Earth? & How can you become a good steward of your environment?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> glacier melt sea ice melt albedo positive feedback loop urban heat island 	<p><u>Disrupted Symbiosis</u></p> <p>GQs: How do we know that anthropogenic activities are having an adverse effect on the Earth? & How can you become a good steward of your environment?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> symbiosis coral bleaching heat capacity ocean warming ecological tolerance 	<p><u>Fragile</u></p> <p>GQs: How do we know that anthropogenic activities are having an adverse effect on the Earth? & How can you become a good steward of your environment?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> ocean acidification carbon sink pH Calcium Carbonate 	<p><u>Record Breaker: June 2024</u></p> <p>GQs: How do we know that anthropogenic activities are having an adverse effect on the Earth? & How can you become a good steward of your environment?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> global warming global temperatures 	<p><u>Equity vs. Equality</u></p> <p>GQs: How do we know that anthropogenic activities are having an adverse effect on the Earth? & How can you become a good steward of your environment?</p> <p>TTW: Show the phenomenon and engage students in the see-think-wonder protocol.</p> <p><u>Vocabulary</u></p> <ul style="list-style-type: none"> climate justice

	<p><i>Note: You can include a visual model of glacier melt and ice melt to show the difference between the two.</i></p> <p><i>Materials include 2 large plastic bins/tanks, 2 blocks of frozen ice water with blue dye, and a brick or some sort of rocks to go in one.</i></p>				
<p>Guided Practice/Transition</p>	<p>Santorini, Greece</p> <p>TTW: Engage students in photos of Santorini, Greece and ask students if they are familiar. Like a SEE-THINK-WONDER, have students observe and explore the photo. Ask:</p> <p>-What do you notice about this top vacation city?</p> <p>- Do you believe there is a connection between this and sea levels rising? Why or Why not? (<i>Note: Reflectiveness of white surfaces is the connection, do not reveal it yet</i>)</p> <p>Materials:</p> <ul style="list-style-type: none"> • Any photo of Santorini, Greece <p>Advantages and Disadvantages of Ice Melt</p> <p>TTW: Explain how students will work in pairs to identify advantages and disadvantages of glacier melts. The teacher will create a T-Chart on the board and model how students will come and write any advantages or disadvantages of ice or snow melt. (Note: This can be made into a competition). Discuss the advantages and disadvantages of the whole group and students will write them in their notes. Have students look at the board and identify if the</p>	<p>Warming Oceans</p> <p>TTW: Engage students in a video to review coral bleaching and how it results from warming ocean water, due to water having a higher heat capacity. This disrupts the symbiotic relationship of the coral and zooxanthellae (algae) due to the organism's ecological tolerance range.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Coral Bleaching <p><i>Textbook Reference: 6.3 pgs 176- 181</i></p>	<p>Ocean Acidification</p> <p>TTW: Engage students in a drag and drop review of the process of ocean acidification. Students can add to their notes as they see fit.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Ocean Acidification Drag and Drop <p><i>Textbook Reference: 6.3 pgs 176- 181</i></p>	<p>Environmental Law Matching</p> <p>TTW: Model how students will match the law with the correct descriptors (Why & What). Students will use only what they know. Then students will rotate groups to observe what they have matched to compare. Students can leave any feedback via sticky note. Students will rotate at least two additional times before returning to their groups to receive feedback. The teacher will then review with the whole group and students will fill in the table of the correct laws and descriptors.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Environmental Law (cut outs) • Environmental Laws - Blank <p><i>Textbook Reference: 18.3 pgs 615-624</i></p>	<p>Environmental Discrimination of GA</p> <p>TTW: Explain how students will have 10 minutes to work in pairs to research environmental discrimination in Georgia. Students will then rotate to a different pair to compare information. The teacher will allow them to complete at least three rotations. Students will then discuss whether they believe that environmental discrimination is an issue in their area. The instructor will then engage students in a video of climate justice across the globe.</p> <p>Materials:</p> <ul style="list-style-type: none"> • Chromebook • Access to Internet • Climate Justice & Human Rights Explained Video <p><i>Textbook Reference: 18.3 pgs 615-624</i></p>

	<p>advantages outweigh the disadvantages or vice versa. One of the disadvantages should be loss of reflective ability. If not listed add and discuss albedo effect.</p> <p><u>Materials:</u></p> <ul style="list-style-type: none"> • Expo Marker • White Board • Albedo Effect Demonstration <p><i>Textbook Reference: 16.2 pgs 536- 552</i></p>				
Independent Practice	<p>Sustainability Podcast</p> <p>TSW: Work in groups of threes to plan and develop a podcast that discusses how they plan to reduce their contribution to environmental issues. Students can choose debate styles or information, but all students must participate in the communication of their own individual sustainability plan. Note students within a group do not have to necessarily agree, their podcast must show their position with evidence.</p> <p><u>Materials:</u></p> <ul style="list-style-type: none"> • Podcast Rubric <p><i>*Ecological Footprint: Student groups should be going presenting their ecological footprint project during this week.</i></p>	<p>Sustainability Podcast</p> <p>TSW: Work in groups of threes to plan and develop a podcast that discusses how they plan to reduce their contribution to environmental issues. Students can choose debate styles or information, but all students must participate in the communication of their own individual sustainability plan. Note students within a group do not have to necessarily agree, their podcast must show their position with evidence.</p> <p><u>Materials:</u></p> <ul style="list-style-type: none"> • Podcast Rubric <p><i>*Ecological Footprint: Student groups should be going presenting their ecological footprint project during this week.</i></p>	<p>Sustainability Podcast</p> <p>TSW: Work in groups of threes to plan and develop a podcast that discusses how they plan to reduce their contribution to environmental issues. Students can choose debate styles or information, but all students must participate in the communication of their own individual sustainability plan. Note students within a group do not have to necessarily agree, their podcast must show their position with evidence.</p> <p><u>Materials:</u></p> <ul style="list-style-type: none"> • Podcast Rubric <p><i>*Ecological Footprint: Student groups should be going presenting their ecological footprint project during this week.</i></p>	<p>Sustainability Podcast</p> <p>TSW: Work in groups of threes to plan and develop a podcast that discusses how they plan to reduce their contribution to environmental issues. Students can choose debate styles or information, but all students must participate in the communication of their own individual sustainability plan. Note students within a group do not have to necessarily agree, their podcast must show their position with evidence.</p> <p><u>Materials:</u></p> <ul style="list-style-type: none"> • Podcast Rubric <p><i>*Ecological Footprint: Student groups should be going presenting their ecological footprint project during this week.</i></p>	<p>Sustainability Podcast</p> <p>TSW: Work in groups of threes to plan and develop a podcast that discusses how they plan to reduce their contribution to environmental issues. Students can choose debate styles or information, but all students must participate in the communication of their own individual sustainability plan. Note students within a group do not have to necessarily agree, their podcast must show their position with evidence.</p> <p><u>Materials:</u></p> <ul style="list-style-type: none"> • Podcast Rubric <p><i>*Ecological Footprint: Student groups should be going presenting their ecological footprint project during this week.</i></p>
Assessment/Summary	<p>Painting Solutions</p> <p>Students will read the</p>	<p>90%</p> <p>Students will read NOAA's</p>	<p>Think-Pair-Share</p> <p>Students will discuss the</p>	<p>Amendments</p> <p>Students will be assigned one</p>	<p><i>The following weeks should be used to</i></p>

	<p>following articles to summarize the connection of Sarontini to Urban Heat Island and how paint can be used as a solution to reduce the impact. Summary needs to be 5-7 sentences.</p> <ul style="list-style-type: none"> • Article #1 - White paint: a cool solution for climate change? • Article #2 -Hot time in the City 	<p>Ocean Warming and discuss via sticky note why 90% of global warming is occurring in the oceans.</p>	<p>following:</p> <ol style="list-style-type: none"> 1. <i>How might the degradation of ocean-bottom habitats impact humans as much as it impacts the environment.</i> 2. <i>Does ocean acidification impact coral reefs?</i> 3. <i>How will humans be affected if coral reefs continue to be degraded?</i> 	<p>of the environmental laws and they will recommend any necessary amendment or propose a new law based on current needs. Student groups will place their amendments or recommendations in a shared google slide. They must identify/include the original law on their designated slide along with the new recommendation.</p>	<p><i>present their podcast and prepare for final exams.</i></p> <p>SUGGESTED ASSESSMENT DAY (Unit Assessment)</p>
<p>Small Group Tasks (TBA)</p>					

Assessment Prep

Prepare students for assessment by reviewing the following concepts.

Reference Chapter 6 Summary (pg. 187)

- Watershed
- Eutrophication
- Wetlands
- Ocean Warming & Coral Bleaching
- Ocean Acidification

Reference Chapter 7.2 Summary (pg. 233)

- Biomagnification

Reference Chapter 9.2 Summary (pg. 315)

- Green Revolution
- Pesticides
- Genetically Modified Organisms (GMO)

Reference Chapter 10 Summary (pg. 349)

- Water Use
- Water Pollution
- Water Contamination

Reference Chapter 14 Summary (pg. 485)

- Human Population Growth
- Age Structure
- Demographic Transition
- Urbanization

Reference Chapter 16 Summary (pg. 563)

- **Air Pollution**
- **Thermal Inversion/Smog**
- **Ozone Depletion**
- **Climate Change**
- **Glacier Melt**
- **Ice Melt**

Reference Chapter 18.3 Summary (pg. 629)

- **Environmental Law (Regulation)**
- **Climate/Environmental Justice**

Labs / Investigations

Mandatory Labs	Explore Learning Gizmo	Pivot Interactives/Phet
<ul style="list-style-type: none">● Design Your Air Filter	<ul style="list-style-type: none">● Beat the Heat - STEM Case● Sound Off, Please! - STEM Case● Water Contamination - STEM Case● Pond Ecosystem Gizmo	<ul style="list-style-type: none">● Water Quality Study: The Mississippi Watershed● Ocean Acidification

Additional Resources/Tasks

Supplemental Resources	Water Sampling Simulation https://conserve.nmsu.edu/conserve-sampling-app/index.html
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