Unit Title: Populations	**Content Area:** Environmental Science	**Grade Level:** 9-12

Unit Summary: This unit looks at factors that affect populations within different ecosystems. Students will look at population growth and factors that limit population growth. How species interact with each other will also be studied. The unit continues with a look at human populations, and what impacts population growth. Students will analyze data using graphs and maps to interpret the impact population growth has had on the global community. Students will also examine biodiversity, the benefits of biodiversity, and look at why biodiversity is at risk. Students will study invasive species as well as endangered species. Students will also look at ways the U.S. and the world is trying to deal with preservation of species and biodiversity. Crosscutting concepts include patterns, stability and change, and cause and effect.

Unit Essential Questions:

- How and why do populations grow?
- What do factors like population density, movement, birth/death rate, movement and composition mean for the sustainability of the planet?
- How has the biodiversity of the planet been affected by population growth?
- What is our role as global citizens to protect biodiversity?

Unit Enduring Understandings:

- Population size can be predicted based on different factors such as the age structure of the population, survivorship, fertility rates and migration.
- With rapid population growth, the vitality of the population is affected in terms of availability of fuel, safe drinking water, food and impact on the land.
- Biodiversity is a vital key to a healthy existence on Earth. We need to understand and preserve biodiversity to ensure our own survival. There are many benefits to ensure biodiversity as all the species are interconnected within the ecosystems. Biodiversity is at risk as seen by our now extinct and endangered species. Habitat destruction, introductions of invasive species, excessive hunting, harvesting and fishing, and pollution is having a negative impact on the planet's biodiversity.
- There are different ways the United States and our global community are trying to preserve biodiversity. Zoos and aquariums often house rare species, there are now federal and state laws aimed at conservation and protection of endangered species and there are global efforts run by groups like The World Wildlife fund, all to support the Earth's biodiversity.

Possible Student Misconceptions:

- Earth can support our world's growing populations.
- We cannot not have an impact on Earth's biodiversity.
- Endangered species are not a big deal.

NJCCCS: 5.1.12.D.1, 5.1.12.D.2, 5.3.12.C.1, 5.3.12.C.2

NGSS Performance Expectations: *Students who demonstrate understanding can…*

- HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* [Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]
- HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. [Clarification Statement: Emphasis is on: (1) distinguishing between group and individual behavior, (2) identifying evidence supporting the outcomes of group behavior, and (3) developing logical and reasonable arguments based on evidence. Examples of group behaviors could include flocking, schooling, herding, and cooperative behaviors such as hunting, migrating, and swarming.]
- 3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.* [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]

Primary CCSS ELA/Literacy Connections: CCSS.ELA-LITERACY.RL.9-10.1
Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Primary CCSS Mathematics Connections: CCSS.MATH.CONTENT.HSS.IC.A.1
Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

Lesson Pace & Sequence

Lesson Title/Number: Populations. (1)	**Learning Objective(s):** Students will be able to identify populations in ecosystems and be able to estimate population sizes using the methods of mark and recapture.	**Lesson Duration:** 45 minutes

Learning Cycle	***Learning Activities***	***Resources/Materials***	***Science and Engineering Practices***	***Disciplinary Core Ideas***	***Crosscutting Concepts***

What lesson elements will support students' progress towards mastery of the learning objectives(s)? ****Elements do not have to be in conducted in sequence.***	***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Do now: (Have a picture up on screen of an ecosystem with various different populations of animals) Ask students, using an example from the picture, what is a population?	• Smartboard or projector		LS2.D: Social Interactions and Group behavior	
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Have students read pages 211-212. Answer the following: What is a population? What are some properties of populations? What does a population grow?	• Textbook		LS2.D: Social Interactions and Group behavior	
Explore: What hands-on/minds-on common experience(s) will you provide for students?	Lab activity: mark and recapture lab.	• Mark and Recapture Lab: http://www.biologycorner.com/worksheets/estimating_population_size.html	Obtaining, Evaluating and Communicating Information	LS2.D: Social Interactions and Group behavior	Patterns
Explain: How will you help students connect their exploration to the concept/topic under investigation?	By analyzing data in lab.		Obtaining, Evaluating and Communicating Information	LS2.D: Social Interactions and Group behavior	Patterns
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	Read sea turtle article. What down 3 questions you have after reading this article?	• Evaluating Population Recovery for Sea Turtles: http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2664.2012.02143.x/abstract	Obtaining, Evaluating and Communicating Information	LS2.D: Social Interactions and Group behavior	Patterns
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Conclusion questions	• Mark and Recapture Lab: http://www.biologycorner.com/worksheets/estimating_population_size.html	Obtaining, Evaluating and Communicating Information	LS2.D: Social Interactions and Group behavior	Patterns
Extend: How will students deepen their conceptual understanding through use in new context?	Find a recent article online that discusses the estimation of a population. Be prepared to share with the class.	• Internet		LS2.D: Social Interactions and Group behavior	
Lesson Title/Number: Carrying capacity and population growth. (2)		**Learning Objective(s):** By working with partner on packet, students will be able to classify factors that limit population growth as either density-dependent or density-independent, predict what would happen to the population size if the following occurs: emigration, immigration, changes in birth rate or death rate;			**Lesson Duration:** 90 minutes

		interpret 2 different graphs of population growth.			
Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Do now: Have pictures of endangered species in NJ on Smartboard. Ask students, what do you think these species have in common? When a correct answer is given, ask students "Why do you think these species are endangered?"	• Endangered Species in NJ: http://www.nydailynews.com/news/national/red-knot-shorebird-new-jersey-lands-endangered-wildlife-list-article-1.1028202		LS2.A: Interdependent Relationships in Ecosystems	Stability and Change
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Rear article on Red Knot shoreboard and discuss.	• Ecology Unit – Population Growth Activities: http://www.crazyteacherlady.com/uploads/5/1/4/8/5148626/objective_2_activities_pop_growth.pdf		LS2.A: Interdependent Relationships in Ecosystems	Stability and Change
Explore: What hands-on/minds-on common experience(s) will you provide for students?	Have students work with partner on packet. (see hyperlink)			LS2.A: Interdependent Relationships in Ecosystems	Stability and Change
Explain: How will you help students connect their exploration to the concept/topic under investigation?	Have periodic whole class check points so class can come together to discuss and clarify.			LS2.A: Interdependent Relationships in Ecosystems	Stability and Change
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	By applying what students have learned to new information in extension activity, students will apply the concept of carrying capacity as it relates to endangered species.			LS2.A: Interdependent Relationships in Ecosystems	Stability and Change
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Collect packet questions			LS2.A: Interdependent Relationships in Ecosystems	Stability and Change

Extend: How will students deepen their conceptual understanding through use in new context?	Have students pick an endangered species to research. How has their carrying capacity been impacted and what can we do change this impact?	• Internet		lS2.A: Interdependent Relationships in Ecosystems	Stability and Change
Lesson Title/Number: Different ways species interact. (3)		**Learning Objective(s):** By taking notes from power point, playing symbiotic card game and creating brochure, students will be able to compare each of the types of symbiotic relationships.			**Lesson Duration:**125 minutes
Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Do now: Review the different types of symbiotic relationships with PowerPoint	• Symbiotic Relationships PowerPoint: http://classroom.jc-schools.net/coleytech/dynamic_curriculum/science/symbioticrelations.ppt		LS2.A: Interdependent Relationships in Ecosystems	
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Provide examples of each type of symbiotic relationships by showing video clips.	• Ecological Relationships: http://education.nationalgeographic.com/education/activity/ecological-relationships/?ar_a=1		LS2.A: Interdependent Relationships in Ecosystems	
Explore: What hands-on/minds-on common experience(s) will you provide for students?	Play Good buddies card game	• Good Buddies Symbiosis: http://sciencespot.net/Media/GoodBuddies.pdf		LS2.A: Interdependent Relationships in Ecosystems	Cause and Effect: Mechanism and Prediction
Explain: How will you help students connect their exploration to the concept/topic under investigation?	Teacher will rotate groups as they play card game to facilitate understanding of symbiotic relationships			LS2.A: Interdependent Relationships in Ecosystems	Cause and Effect: Mechanism and Prediction
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	Have students create brochure that defines each of the symbiotic relationships (one per flap) and provide examples of each.	• Textbook/Internet.	Obtaining, Evaluating and Communicating Information	LS2.A: Interdependent Relationships in Ecosystems	

Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Rubric for brochure. Quiz	• Symbiotic Relationships Quiz: http://fc.pickerington.k12.oh.us/~jon_hansen/S029FD145.4/Symbiotic+Relationships		LS2.A: Interdependent Relationships in Ecosystems	
Extend: How will students deepen their conceptual understanding through use in new context?	Studying population growth lab, pages 230-231 in text. Read and discuss pages 232-233, where should wolves roam?	• Textbook		LS2.A: Interdependent Relationships in Ecosystems	
Lesson Title/Number: Human populations (4)		**Learning Objective(s):** By completing a web quest, students will examine human population growth and compare the population growth of the U.S. to other countries.			**Lesson Duration:** 45 minutes
Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Do now: What do you think the population of the U.S. population right now? How much do you think it will change within this class period?			LS2.A: Interdependent Relationships in Ecosystems	
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Students will complete a web quest- will examine current data.	• Human Population Growth Web Quest: http://www.shenet.org/high/hsacaddept/science/jstdenis/human_population_growth_web_quest.htm	Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	Patterns
Explore: What hands-on/minds-on common experience(s) will you provide for students?	Complete web quest	• Computer with Internet	Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	Patterns

Explain: How will you help students connect their exploration to the concept/topic under investigation?	Web quest questions ask them to look at current population data. Teacher should rotate room as students complete web quest.		Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	Patterns
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	Read pages 235-240. Answer questions 1-6 page 240.	• Textbook		LS2.A: Interdependent Relationships in Ecosystems	
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Complete web quest questions			LS2.A: Interdependent Relationships in Ecosystems	
Extend: How will students deepen their conceptual understanding through use in new context?	For homework: What is the population of Newark? How has it changed since you were born?	• Internet	Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	
Lesson Title/Number: What affects the growth rate of the human population? (5)		**Learning Objective(s):** Students will investigate factors that affect the growth rate of the human population.			**Lesson duration:** 90 minutes
Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Review Human population PowerPoint. Have students add any new information to notebook.	• Human Population Power Point: http://www.umsl.edu/~naumannj/Geography%20PowerPoint%20Slides/population/Population.ppt		LS2.A: Interdependent Relationships in Ecosystems	
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Watch you tube video, 7 billion, National Geographic Magazine	• YouTube Video – 7 Billion: http://www.youtube.com/watch?v=sc4HxPxNrZ0		LS2.A: Interdependent Relationships in Ecosystems	

Explore: What hands-on/minds-on common experience(s) will you provide for students?	Complete activity, Earth in Peril.	• Nova Online – World in Balance: http://www.pbs.org/wgbh/nova/worldbalance/	Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	Cause and Effect
Explain: How will you help students connect their exploration to the concept/topic under investigation?	Students will examine geographical connections between population growth and environmental degradation.		Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	Cause and Effect
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	Develop questions to aid students in understanding of maps		Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	Cause and Effect
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Activity questions/class discussion of maps		Analyzing and Interpreting Data	LS2.A: Interdependent Relationships in Ecosystems	Cause and Effect
Extend: How will students deepen their conceptual understanding through use in new context?	Read article from hyperlink, population campaigns. What 3 things surprised you about this article?			LS2.A: Interdependent Relationships in Ecosystems	
Lesson Title/Number: How many people can the world support? **(6)**		**Learning Objective(s):** By watching video, students will be able to make predictions on how close the human population may be to the Earth's carrying capacity.			**Lesson Duration:** 45 minutes
Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Do now: Do you think we are reaching Earth's carrying capacity? Support your answer.			LS2.A: Interdependent Relationships in Ecosystems	
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Watch video and answer questions, How many people can live on planet earth? (complete on you tube)	• YouTube Video - How many people can live on planet Earth?: http://www.youtube.com/w		LS2.A: Interdependent Relationships in Ecosystems	

		atch?v=dN06tLRE4WE			
Explore: What hands-on/minds-on common experience(s) will you provide for students?	complete questions	• Questions – How many people can live on planet Earth?: http://mrkellyshistory.weebly.com/uploads/1/3/2/5/13254142/questions_-_how_many_people_can_live_on_planet_earth-_.pdf		LS2.A: Interdependent Relationships in Ecosystems	Cause and Effect: Mechanism and Prediction
Explain: How will you help students connect their exploration to the concept/topic under investigation?	Class discussion of questions			LS2.A: Interdependent Relationships in Ecosystems	Cause and Effect: Mechanism and Prediction
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	Complete skills practice lab, pages 254-255.	• Textbook		LS2.A: Interdependent Relationships in Ecosystems	
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	video and text questions	• Textbook		LS2.A: Interdependent Relationships in Ecosystems	
Extend: How will students deepen their conceptual understanding through use in new context?	Read pages 241-247. Complete questions 1-5 page 247.	• Textbook		LS2.A: Interdependent Relationships in Ecosystems	
Lesson Title/Number: Biodiversity. (7)		**Learning Objective(s):** By viewing PowerPoint, taking notes and creating brochure/article, students will be able to describe what biodiversity it, explain why biodiversity is important to ecosystems and humans and explain the effects of invasive species on biodiversity.			**Lesson Duration:** 180 minutes

Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Review PowerPoint with students. Have them add new information to notes	• Biodiversity PowerPoint: http://facstaff.gpc.edu/~apennima/ENVS/Biodiversity.ppt		LS4.D: Biodiversity and Humans	
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Have students create a list of benefits of biodiversity and a list of why biodiversity is a risk. Include explanations and examples of each term.	• Textbook, pages 259-269.		LS4.D: Biodiversity and Humans	
Explore: What hands-on/minds-on common experience(s) will you provide for students?	Have students research an invasive species common to NJ. Students will create a newspaper article or brochure to present to class. Refer to hyperlink for model of rubric.	• Invasive Species Project Rubric: http://www.meredithmiddle.org/ourpages/auto/2012/1/27/49263926/Invasive%20Species%20Project-RUBRIC.pdf	Obtaining, Evaluating, and Communication Information	LS4.D: Biodiversity and Humans	
Explain: How will you help students connect their exploration to the concept/topic under investigation?	Have students complete work on computers. Teacher can then rotate and discuss projects with individual students as needed.	• Internet	Obtaining, Evaluating, and Communication Information	LS4.D: Biodiversity and Humans	
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	Complete section review page 262, questions 1-5	• Textbook		LS4.D: Biodiversity and Humans	
Lesson Title/Number: Threats to Biodiversity. (8)		**Lesson Objective:** By identifying endangered species and reading text/working with partner, students will be able to compare biodiversity of different ecosystems, explain why biodiversity is important and explain why biodiversity is at risk.			**Lesson Duration:** 90 minutes

Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Do now: Name an endangered species. Do you know why this species is endangered?			LS4.D: Biodiversity and Humans	
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Watch YouTube video: Endangered species by Earth and animal Lover	• YouTube Video – Endangered Species: http://www.youtube.com/watch?v=I-7wLdKjf2Y		LS4.D: Biodiversity and Humans	
Explore: What hands-on/minds-on common experience(s) will you provide for students?	With partner, list the causes of extinctions, pages 264-265. Share as class. With partner, identify areas of greater biodiversity, pages 266-269. Discuss as class.		Obtaining, Evaluation and communicating Information	LS4.D: Biodiversity and Humans	Patterns
Explain: How will you help students connect their exploration to the concept/topic under investigation?	Facilitate class discussion		Obtaining, Evaluation and communicating Information	LS4.D: Biodiversity and Humans	Patterns
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	Find out 10 new facts on the areas of greater diversity identified in class discussion. Be prepared the following class period to share with class.		Obtaining, Evaluation and communicating Information	LS4.D: Biodiversity and Humans	Patterns
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Teacher will review lists generated by class. Possible quiz.			LS4.D: Biodiversity and Humans	
Extend: How will students deepen their conceptual understanding through use in new context?	*planned trip to a zoo. Time permits, Viewing of movie, The Medicine man.	• The Medicine Man Movie Worksheet: http://aschutter.files.wordpress.com/2013/03/medicine-man-movie-qs.doc		LS4.D: Biodiversity and Humans	

Lesson Title/Number: The future of Biodiversity. (9)		**Learning Objective(s):** By participating in Jigsaw activity, students will be able to compare the different methods used around the world to preserve biodiversity.			**Lesson Duration:** 90 minutes
Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Elicit: How will you access students' prior knowledge?	Do now: What efforts do you know of are out there to preserve biodiversity?			LS4.D: Biodiversity and Humans	
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Show a clip from Discovery channel's series, Whale wars.			LS4.D: Biodiversity and Humans	
Explore: What hands-on/minds-on common experience(s) will you provide for students?	Jig saw activity: Have each group research an area of conservation. Suggested topics: captive-breeding, germ plasm, zoos/aquariums, conservation strategies within NJ, Endangered species Act, Green peace, Habitat conservation plans, Green acres, CITES, Biodiversity Treaty, World Wildlife Fund.		Obtaining, Evaluating, and Communicating Information	LS4.D: Biodiversity and Humans	Cause and Effect
Explain: How will you help students connect their exploration to the concept/topic under investigation?	Create mini poster to share with class.		Obtaining, Evaluating, and Communicating Information	LS4.D: Biodiversity and Humans	
Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?	Students will research topic and "teach" to class.		Obtaining, Evaluating, and Communicating Information	LS4.D: Biodiversity and Humans	

Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Have students take notes on each topic		Obtaining, Evaluating, and Communicating Information	LS4.D: Biodiversity and Humans	
Extend: How will students deepen their conceptual understanding through use in new context?	Critical thinking questions, page 275.			LS4.D: Biodiversity and Humans	
Lesson Title/Number: Unit review/Unit assessment (10)		**Learning Objective(s):** By working with partner, students will complete activities to review for unit test.			**Lesson Duration:** 90 minutes
Learning Cycle ***What lesson elements will support students' progress towards mastery of the learning objectives(s)?*** ****Elements do not have to be in conducted in sequence.***	***Learning Activities*** ***What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?***	***Resources/Materials*** ***What curricular resources/materials are available to facilitate the implementation of the learning activities?***	***Science and Engineering Practices*** ***What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?***	***Disciplinary Core Ideas*** ***What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?***	***Crosscutting Concepts*** ***What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?***
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Have students work in groups on end of the chapter reviews and teacher created study guides. Have students play Jeopardy to review for unit test.	• Jeopardy Style Review Game: https://www.superteachertools.net/jeopardyx/			
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Review of questions and study guide. Unit test				