Course Title – Environmental Science

Implement start year – 2018-2019

Revision Committee Members, email, extension –

Sarah Moretti- smoretti@lrhsd.org Ext. 8400
Diane Kelly- dkelly@lrhsd.org Ext. 8288
Dane Reed- dreed@lrhsd.org Ext. 8438

Unit #3, topic – Humans and the Environment

Transfer Goal –

Students will be able to independently use their learning to identify and explain ways that humans impact their environment and apply concepts of sustainability to decrease their ecological footprint on their environment.

Stage 1 – Desired Results

Established Goals

www.nextgenerationscience.org
Next Generation Science Standards
HS. Human Sustainability

HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3 Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces' impacts of human activities on natural systems.

HS-ESS3-6 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity

21st Century Themes
(www.21stcenturyskills.org)

X_ Global Awareness
___Financial, Economic, Business and Entrepreneurial Literacy
X___Civic Literacy
X___Health Literacy
X___Environmental Literacy

21st Century Skills

Learning and Innovation Skills:
X___Creativity and Innovation
X___Critical Thinking and Problem Solving
X___Communication and Collaboration

Information, Media and Technology Skills:
X___Information Literacy
X___Media Literacy
___ICT (Information, Communications and Technology) Literacy

	Life and Career Skills: X___Flexibility and Adaptability X___Initiative and Self-Direction X___Social and Cross-Cultural Skills X___Productivity and Accountability X___Leadership and Responsibility
Enduring Understandings: *Students will understand that . . .* *EU 1* humans can have both a positive and negative impact on the environment. *EU 2* cities can have both positive and negative impacts on the environment. *EU 3* natural disasters in the environment can affect human health adversely.	**Essential Questions:** *EU 1* • What impact does population growth have on ecological footprints? • Why does population growth differ around the world? • How do humans impact their environment? • In what ways has technology changed due to human impact on the environment? *EU 2* • How do humans impact land cover and land use when building urban areas? • Do urban areas increase or decrease pollution? • Do urban areas contribute positively or negatively to ecology? *EU 3* • How do earthquakes, volcanoes, storms, and avalanches damage property? • How do earthquakes, volcanoes, storms, and avalanches threaten human lives? • How have natural disasters impacted your local community?

Knowledge: *Students will know . . .*	**Skills:** *Students will be able to . . .*
EU 1 • trends in human population growth. • why we study human populations. • factors that influence the impact a population has on its environment. • how to define sustainability. • how to define and discuss ecological footprint. • how technology is changing to decrease our ecological footprint EU 2 • the characteristics of a sustainable city. • the use of the land on which we live. • how urbanization leads to sprawl. • ecological advantages and disadvantages of city living. EU 3 • major historical natural disasters that impacted changes in society, ecosystems, technology and legislation. • ways in which natural disasters affect human health	*EU 1* • analyze data on human population growth. • identify the relationship between human population growth and environmental changes. • analyze the components of a sustainable environment. • compare and contrast the ecological footprint of wealthy versus poorer nations. • analyze the latest eco-friendly technology *EU 2* • apply the characteristics of sustainability to a nearby city (ie: Philadelphia, New York, etc.). • describe how land is used in an urban, suburban and rural community. • develop images of ways urbanization leads to sprawl. • compare and contrast advantages and disadvantages of city living. EU 3 • investigate ways natural disasters have changed society, ecosystems, technology and legislation. • explain ways that natural disasters impact human health

Stage 2 – Assessment Evidence

Recommended Performance Tasks:.

- The student will take on the role of a representative of the Burlington County Recycling Center and wants to help local schools improve their ecological footprint on the local community. The student will investigate the following topics within a given school building and create a visual presentation to be shared to the administrators with suggestions for how to improve/decrease the school's ecological footprint. The presentation must address at least three of the following issues: waste, recycling, energy use, water use, land use, pollution produced, natural gas used, materials used and food by-products. (EU 1)

- The student will take on the role of a realtor from the local community, assigned to help a college graduate choose the best location to purchase their first home. The college graduate needs to be informed on transportation, dwelling options, land use, sustainability and population of the three surrounding community types. The student will create a pamphlet presenting the above information on an urban,

suburban and rural location and highlight the advantages and disadvantages of each. Pamphlet must include at least one image of each of the three types of communities. (EU 2)

- The student will take on the role of a reporter for a fictional newspaper called The Jersey Shore Times and has been assigned to report on the recent legislation changes that have occurred since Hurricane Sandy hit in 2012. The student's written article must include three major changes and how those changes will impact residents and ecosystems of shore communities. (EU 3)

Other Recommended Evidence: *Tests, Quizzes, Prompts, Self-assessment, Observations, Dialogues, etc.*

- Tests/quizzes
- Labs and lab reports
- Models, graphs, diagrams (atoms, molecules, physical and chemical changes)
- Student reflection in journal
- Teacher observation during class discussion

Stage 3 – Learning Plan

Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: *Consider the WHERETO elements. Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.*

- Read graphs/charts on population and discuss population growth (A)
- Discuss population and population growth (A)
- Define sustainability (A)
- Explain urban sprawl (A)
- Identify factors that influence an area's ecological footprint (A, M)
- List environmental changes that occur as populations grow (A, M)
- Analyze a satellite image of the Earth at night to see which cities use the most electrical energy. (A, M)
- Create a new city and apply concepts of sustainability (A, M, T)
- Create a bulletin board showing the ecological footprints of countries from all over the world (M)
- Draw and Map examples of land use and land cover areas (M)
- Create a model of a specific land area (urban, suburban, rural) (M)
- Create a graphic organizer to display the advantages and the disadvantages of living in a city (M)
- Present to class the different types of environments, include sustainability and ecological factors (M)
- Research 5 natural disasters and present findings on the impact to environment and society (M)
- Build a useable object out of recycled materials. (M)
- Community Based Activities relating to population growth, sustainability and ecological footprints (Pine Barrens, Island Beach State Park, Palmyra Nature Cove, Philadelphia, Sandy Hook, Wetlands Institute, water treatment plant (T)
- Obtain permission and plant a new species of tree on school grounds or in a local park and monitor it over time. (T)