North Polk Community Schools Pacing & Course Description Guide

Grade Level: 11-12	**Content:** DMACC Environmental Science	**Year:** 2022-23

Course Description/Rationale

DMACC ENVIRONMENTAL SCIENCE (10-12) Full Year **(RAI)**
Recommended: Chemistry or AP Chemistry, A Biology course
This course combines the basic principles of environmental science with ecology. Issues examined include environmental policy, sustainability, and biodiversity. Energy conservation, water resources, agriculture, climate change, and waste management are also emphasized. Students will receive 4 DMACC credits for ENV 115 (3 credit), and ENV 116 (1 credit). (2 HS credits)

Name of Unit	Time Frame	Essential Learning Target	Standard(s)
1: The Living World: Ecosystems	5 Weeks	I can create an ecocolumn and gather water quality data. I can differentiate between biogeochemical cycles. I can conduct a mark-recapture field experiment.	DMACC Competencies 1-1 to 1-5 10-1 7-1 AP Unit 1 Standards Integrated
2: The Living World: Biodiversity	4 Weeks	I can create a video explaining biodiversity in a specific ecosystem. I can calculate biodiversity using the simpson diversity index. I can differentiate between generalist and specialist species. I can identify the negative effects of urbanization related to the influx of generalist species. I can visualize biogeography effects on population dynamics.	DMACC Competencies 5-1 5-2 3-3 AP Unit 2 Standards
3: Population	3 Weeks	I can differentiate between R and K selection. I can explain a survivorship curve. I can graph and explain demographic transition. I can observe real natural selection data via the HHMI Wildebeest Simulation.	DMACC Competencies 4-1 4-2 4-4 3-2 AP Unit 3 Standards

4: Earth Systems and Resources	3 Weeks	I can describe what powers plate tectonics. I can differentiate between all soil horizons. I can describe a local watershed based on ecological factors. I can conduct an experiment that visually shows erosions effects on different soil types.	DMACC Competencies 8-2 8-3 8-4 AP Unit 4 Standards
5: Land and Water Use	4 Weeks	I can research real-life examples of tragedy of the commons. I can calculate my ecological footprint. I can gain perspective on pros and cons of urbanization. I can build my own sustainable city.	DMACC Competencies 7-4 8-1 10-4 AP Unit 5 Standards
6: Energy Resources and Consumption	3 Weeks	I can research global energy consumption and recognize key issues. I can look at current events in the energy crisis and discuss possible solutions. I can differentiate between types of energy. I can create a shark tank renewable energy related invention.	DMACC Competencies 6-1 6-2 6-3 AP Unit 6 Standards
7: Atmospheric Pollution	2 Weeks	I can conduct a field experiment to measure air pollution. I can define different types of air pollutants and recognize their source. I can give specific urban examples of thermal inversion. I can explain the process that leads to the formation of acid rain.	DMACC Competencies 9-1 9-2 9-3 10-2 AP Unit 7 Standards
8: Aquatic and Terrestrial Pollution	3 Weeks	1. I can identify differences between point and nonpoint sources. 2. I can describe the impacts of human activities on aquatic ecosystems. 3. I can describe the effects of endocrine disruptors on ecosystems. 4. I can describe the impacts of human activities on wetlands/mangroves. 5. I can explain environmental effects of excessive use of fertilizers and detergents on aquatic ecosystems. 6. I can describe the effects of thermal pollution on aquatic ecosystems. 7. I can describe the effect of persistent organic pollutants on ecosystems. 8. I can differentiate between bioaccumulation and	DMACC Competencies 7-1 7-2 7-3 7-4 AP Unit 8 Standards

		biomagnification. 9. I can describe the effects of solid waste disposal. 10. I can describe current waste reduction methods. 11. I can describe best practices in sewage treatment. 12. I can define lethal dose 50%. 13. I can evaluate dose response curves. 14. I can link pollution to human health issues. 15. I can explain human pathogens and their cycling through the environment.	
9: Evolution	2 Weeks	I can define natural selection. I can conduct an experiment that displays genetic drift and gene flow I can describe the factors related to evolution. I can describe 5 major mass extinctions as they relate to geologic time.	DMACC Competencies 4-1 4-2 4-3 4-4 AP Unit 2 Standards