Flex Environmental Science Curriculum Outline & Assessment Overview

Place-based Learning Field Studies Locations

- Swan Lake Nature Sanctuary
- Reynolds Courtyard Garden
- Reynolds Garry Oak Knoll
- Blenkinsop Meadow
- Playfair Park
- Silverlinings Farm
- Others as opportunities arise

Part 1: Ongoing Naturalist & Field Studies Journal

Hard copy or electronic journal including 3 layers in 3 colours:

A. Photos, Identification, Personal Observations

-Photos/sketches of local flora/fauna species and habitat
-Identification of species
-Personal Observational Notes (structure/function, habitat, interactions, seasonal changes…)
-Personal questions and answer development with observations over time

B. Environmental Science content with Vocabulary

-Added notes learned from Community Experts
-Added notes learned from research (site sources)
-Added notes from Environmental Science theory lessons with appropriate vocabulary (see box below)
-Specified questions and answer development with observations over time (see box below)

- Complex roles and relationships contribute to diversity of ecosystems.

— What are the roles and relationships in a local ecosystem?
— How do some of the roles and relationships in ecosystems contribute to biodiversity?
— Why is diversity an important feature of sustainable ecosystems?

- Changing ecosystems are maintained by natural processes.

— How does energy drive ecological processes?
— How has an ecosystem in your local area changed over time?
— How do energy and matter move through an ecosystem?

- Human practices affect the sustainability of ecosystems.

— How do human actions affect the sustainability of an ecosystem? How do your actions affect the sustainability of your local ecosystem?
— How do First Peoples traditional practices contribute to dynamic equilibrium in an ecosystem?
— How do healthy ecosystems influence the well-being of humans?

- Humans can play a role in stewardship and restoration of ecosystems.

— How do First Peoples perspectives and knowledge inform sustainable practices?
— How could you become involved in a local stewardship project?
— Research information with sources
— Community Expert information

- **aquatic:** pH, flow, dissolved oxygen, turbidity, salinity
- **atmospheric:** sunlight, wind, temperature, pressure
- **edaphic:**
  -soils (e.g., pH, mineral content, water content, temperature, acidity, aeration, nutrients, humus)
  -topography (e.g., altitude, slope, exposure, mountain chains, valleys, plains)
- **levels:** ecosystem, species, genetic
- **roles:** niche, autotrophs, heterotrophs, producers, consumers, decomposers, scavengers, keystone species
- **relationships:**
  -between organisms (e.g., predator/prey, competition, pollination, symbiosis, mutualism, parasitism, commensalism, mimicry)
  -interactions between biotic and abiotic
- **population dynamics:** cyclic fluctuations, birth rate, fertility rate, carrying capacity
- **energy flow:** food chains, food webs, photosynthesis, respiration, trophic levels, productivity, pyramids of energy and biomass
- **matter cycles:** water, nitrogen, carbon, phosphorus
- **succession:** primary and secondary
- **First Peoples knowledge and other traditional ecological knowledge:** agriculture, ethnobotany, forestry, fisheries, mining, energy, controlled burning, harvesting cycles
- **ecosystem services:** water purification, pollination, climate regulation, medicines, food production, waste management
- **human actions:** harvesting, resource extraction and consumption, population growth, urbanization, habitat loss and fragmentation, climate change, pollution, introduced species, invasive species, forest fires
- **First Peoples ways of knowing and doing:** prescribed fire, selective harvesting, plant propagation and pruning, clam gardens
- **stewardship:** sustainable use of, and care for, local resources (e.g., school garden, shoreline cleanup, citizen science projects)
- **restoration practices:** the process of renewing and recovering a degraded, damaged, or destroyed ecosystem (e.g., riparian zone recovery,
invasive species removal, native species planting, ecological engineering, dam removal, hatcheries, wildlife, forestry and fisheries management)

Year A Theory	Year B Theory
Biomes	Biosphere, Lithosphere, Hydrosphere, Atmosphere
Ecosystems	Energy Flow in Ecosystems
How Changes Occur Naturally in Ecosystems	Matter Cycles in Ecosystems
How Humans Influence Ecosystems	All About Abiotic Factors
How Introduced Species Affect Ecosystems	Population Dynamics

Ongoing Each Year: Human Connection: Human Impacts, Ecosystem Services, First Peoples Knowledge, Stewardship & Restoration

C. Personal Creative Interest Lens

Choose an interest and develop in throughout your journal to "make it yours"

Ideas:

-Artistic Lens: colour, texture, patterns in nature…
-Chemical Science Lens: Chemicals in nature producing colour, sap, pheromones…
-Creative Writing Lens: Develop a story throughout your journal inspired by the nature you see…
-Poetry Lens: Create your own poems to pepper throughout your journal connected to your observations in nature
-Food Lens: Find recipes for some wild foraged foods in your nature areas
-Indigenous Lens: Find and record medicinal or other uses of plants
-Historical Lens: Find out and record the history of the natural locations that you are visiting
-Human Impact Lens: Dig into invasive species and/or other human impacts
-Psychology Lens: Reflect on time and nature and its impact on humans and mental health
-Health Lens: Reflect on time and nature and its impact physically on the human body
-Other?

Part 2: Ongoing Eco-Justice Connection

- Action Plan Development within One Planet Living Principles of Sustainabililty https://www.bioregional.com/oneplanetliving/

- Be The Change Earth Alliance Module Selection from these broad topics: http://www.bethechangeearthalliance.org/
- **Health**
- **Conscious Consumption**
- **Conservation**
- **Connection**
- **Justice**

Assessment is based on evidence of learning from:

- Development of understanding through journal [1-2-3 feedback and comments with check point %'s given]
- Completion of Eco-Justice Modules and other assignments [1-2-3 feedback and comments with check point %'s given]
- Participation in and ongoing evaluation of Action Plan Project [1-2-3 feedback and comments with check point %'s given]
- Summative Assessment will be determined through personal interviews based on evidence of learning and achieving course objectives