Ecological Restoration and The Multiple Intelligences

The multiple intelligence theory, first identified by Howard Gardner, states that people do not possess one static type of intelligence (as can be reflected in an IQ score) but rather at least eight different kinds of intelligence.

This theory implies that different people learn in different ways and that the more we can match people to congenial ways of teaching, learning and assessing, the more likely it is that those people will achieve educational success.

The eight intelligences that have been identified are:

Verbal-Linguistic	
	Intrapersonal
Logical Mathematical	
	Visual-Spatial
Body-Kinesthetic	
·	Naturalist
Musical-Rhythmic	
Interpersonal	

The following page outlines how these intelligences can be well utilized in the process of a schoolyard ecological restoration project.

There are numerous books and articles on Multiple Intelligence Theory. A few are listed below: <u>Multiple Intelligences</u> by Howard Gardner <u>Multiple Intelligences in the Classroom</u> by Thomas Armstrong <u>Seven Ways of Knowing</u>, by David Lazear

Verbal-Linguistic

related to words and language, both spoken and written

read historical literature, interview residents, research prior land use, signage, articles for newspapers, public presentations

Visual-Spatial

relies on the sense of sight and being able to visualize an object; ability to create internal mental images

map the site, create a planting design, develop educational signs & brochures, design site experiment, conduct site analysis

Body-Kinesthetic

related to physical movement and knowings/wisdom of the body

prepare the site, collect seed from remnants, lay out site design, grow transplants, controlled burn of restoration

Logical-Mathematical

deductive thinking/reasoning, numbers and the recognition of abstract patterns

develop a species list, seed mix, and project budget, survey existing species, research opportunities

Interpersonal

operates primarily through person-to-person relationships and communication

cooperative/team work throughout entire project, create a planting celebration, neighborhood education, signage

Musical-Rhythmic

based on the recognition of tonal patterns, environmental sounds and a sensitivity to rhythm and beats

create planting celebration, find and perform historical music and dance

Naturalist

ability to discern, identify and classify plants and animals, hears and sees links in nature

create ecosystem design, determine species selection and seed mix, grow transplants, collect seed from remnants, survey existing species Intrapersonal

relates to inner states of being, self-reflection, awareness of spiritual realities

entire process can create sense of purpose, build a personal relationship to the land, opportunity to do something positive for the environment

Ecological Restoration Provides Learning Experiences Throughout the Curriculum

Create native plant crayon rubbings* Visualize and describe life as a prairie ant * Observe butterfly pollination and nectar collecting behavior* Observe Monarch chrvsalis and but-MATH *terfly* **Dissect and examine* soil * Compare biodiversity in a natural area and lawn Collect seed from a restoration or remnant for the project * Make and use dyes from native plants * Scavenger hunt for plant adaptations * Hypothesize and test leaf orientation frequency in Compass Plant * Examine single ecological niches; fit them back together * Measure and compare air pollution at potential restoration sites *Adopt-a-Species: Research, grow and transplant into restoration

* Identify geometric shapes in native plants* Determine migration route and compute migration miles for monarch chrysalis and butterfly *Calculate total acreage of different ecosystems consumed by large cities in the state* Grow a native plant and observe, measure and graph root, shoot and leaf growth *Determine project price for various planting plans* Determine height of trees and buildings on restoration site* Determine project price for various planting plans* Word problems concerning number of seed, amount

SOCIAL

STUDIES

* Read and listen to accounts from early settlers Learn first sounds and letters of native plant names through movement game Make and record monthly observations from a single spot * Create a fictional journal of a Native Ameri-

SCIENCE

can or early settler* Write a poem or Haiku for a plant * Write a dialogue between a plant and pollinator* Take a single-sense walk in the prairie* Write a letter to a great grandparent/child explaining your restoration efforts* Interview area residents about local history* Create native habitat newsletter* Develop materials describing the planting project to the public

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Ecological Restoration Through the Curriculum

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* Read and listen to accounts from early settlers * Make and use dyes from native plants * Determine Monarch migration route, compute migration miles* Find local town and landmark names which reflect a regional heritage* Calculate acreage of specific native plant

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communities consumed by cities in the state* Design a planting celebration * Create a fictional journal of a Native American or early settler * Interview area residents about local history * S t u d y

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LANGUAGE *Design same a Varia-

a planting celebration* Write observations at the spot through the year* Introduce native plants with tion of "Farmer in the Dell"* Create plant crayon

rubbings* Create an memufication booklet with solar graphics* Model life cycle stages of a Monarch * Listen to "Flight of the Bumblebee" and create your own insect symphony * Design and model a hypothetical "best" seed * Develop signs describing project to the public* Discover which instruments best mimic bird calls

Kindergarten through Fifth Grade

Ecological Restoration Provides Learning Experiences Throughout the Curriculum

* Examine and calculate the grass to forb ratio in an ecosystem * Calculate the percentage of "edge" in a remnant * Compare a diet based on

an ecosystem to your own * Test leaf orientation frequency in Compass Plant Insect Galls: survey



frequency, host plant, height, and size * *Observe and record phenology sequences* including color, blossoming and insect life * Examine single niches; fit them together * Measure biodiversity in an native ecosystem and lawn * Adopt-a-Species: Research, grow, transplant, tag and follow in restoration * Experiment with site preparation methods and weed control * Produce a photo essay of an plant's life cycle

* Create a plant purchase plan based on project budget and desired seed list * Examine and calculate the grass to forb ratio in an ecosystem * Calculate the percentage of "edge" in a remnant * Calculate total acreage of different ecosystems consumed by large cities in the state* Graph seed weight and total seed set * Graph phenological sequences * Estimate biomass; compare to other ecosystems * Map proposed restoration site* Compare various seeding rate recommendations * Compute Monarch migration miles* Cor-

insect presence SOCIAL plant and size **STUDIES**

SCIENCE

* Read and listen to accounts from early settlers * Create a fictional journal from a Native American or early settler* Write a poem, sonnet or Haiku for a plant * Insect Pollination: write a dialogue between a plant and pollinator * Inter-

view area residents about local history * Write a letter to a grandparent/child describing your project * Write about a seed's journey to the New World from its native home * Develop signs and pamphlets describing the restoration project to the public * Write, layout and distribute a newsletter*

Develop an advertisement for uses of native plants* Write a journal of out-

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Ecological **Restoration** Through the Curriculum

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* Read and listen to accounts from early settlers * Create a fictional journal of a Native American or early settler* Make and use dyes from native plants * Compare diets based an a native ecosystem to your own * Research local settlement and land use * Find local town and landmark names

which reflect a region's heritage * Determine Monarch migration route and compute miles * Interview longtime area residents about local history * Research land ownership records of school and

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ration Examine land records school

LANGUAGE ' Develop a pictorial species key * Create an fication booklet with solar graphics * Design and a hypothetical "best" seed * Listen to "Flight Bumblebee" and create an insect symphony * Create

a video or slide show to document restoration effort * Produce a photo essay of a plant's life cycle * Create poster session to display experimental results * Develop signs and pamphlets describing the restoration project to the public * Produce a newsletter

Sixth Grade through Twelfth Grade

Activities Associated with Ecological Restoration

Study the Model

- Explore the question, "What is an Ecosystem?"
- · Study prairies, wetlands and woodlands
- Visit native habitat gardens

Investigate Site History

- Find the original land survey
- Locate historical maps and diaries
- Determine past vegetation types and land use
- Interview residents

Make Community Connections

- Involve businesses and neighbors
- Develop signs, brochures, videos
- Write a newsletter
- · Hold community-wide events

Perform Site Analysis

- Determine current vegetation types and land use
- · Note physical and biological characteristics
- Map the site

Plan the Restoration

- Create and layout a design
- Develop a project budget
- Select species
- Determine equipment needs

Prepare the Site

- Prepare the planting bed
- Identify and remove unwanted species

Plant the Site

- Decide on planting technique
- Collect seed and grow transplants
- Hold a planting celebration

Manage the Site

- Monitor plant and animal species
- Conduct burns
- Remove invasive species
- · Keep records

Conduct Research

- Make observations
- Ask questions
- · Design and conduct experiments
- Analyze data
- Share results

