**Lesson Plan: The Cycle of Life in the Temperate Rainforest - Field Trip Experience**

**Subject:** Environmental Science/Biology
**Grade Level:** 10-12
**Topic:** The Cycle of Life in the Temperate Rainforest
**Duration:** Full Day Field Trip (including pre- and post-field trip lessons)

**Big Ideas [Understand]**

* **Ecosystems are dynamic, interconnected, and resilient, with cycles of growth, decay, and regeneration that sustain life.**
* **Human activities and natural processes can disrupt or support the balance of ecosystems.**
* **Indigenous knowledge systems provide valuable insights into sustainable ecosystem management.**

**Competencies [Do]**

* **Conduct field research using scientific methods to investigate the roles of organisms in an ecosystem.**
* **Analyze the interactions and dependencies within an ecosystem, including the flow of energy and cycling of matter.**
* **Evaluate the impact of human activities and natural disturbances on ecosystem dynamics.**
* **Incorporate Indigenous perspectives into the understanding of environmental stewardship and sustainability.**

**Content [Know]**

* The role of primary producers, consumers, and decomposers in energy flow and nutrient cycling.
* Processes of decomposition, nutrient cycling, and their significance in ecosystem functioning.
* Ecological succession and regeneration following natural or human disturbances.
* Indigenous knowledge of land management, sustainability, and the cultural significance of ecosystems.

**Learning Intentions**

* **Students will conduct field observations and collect data on the cycle of life in the temperate rainforest.**
* **Students will analyze the interconnected roles of plants, animals, and decomposers in maintaining ecosystem health.**
* **Students will understand and respect Indigenous perspectives on ecosystem management and sustainability.**

**Rationale**

This lesson immerses students in the temperate rainforest to observe ecological processes in real time. By integrating scientific fieldwork with Indigenous knowledge, students gain a holistic understanding of ecosystem dynamics and the importance of sustainable management.

**Pre-Field Trip Lesson**

**Hook**

* **Activity:** Present a virtual tour of a temperate rainforest, highlighting the complexity of the ecosystem.
* **Discussion:** Ask students to predict how different organisms (trees, fungi, animals) interact and support each other. Discuss visible human impacts on ecosystems and what signs they might observe on the trip.

**Lesson Overview**

* **Content Review:** Discuss key concepts such as photosynthesis, energy flow, decomposition, and nutrient cycling. Emphasize the roles of primary producers, consumers, and decomposers.
* **Indigenous Knowledge:** Introduce Indigenous perspectives on ecosystem management, focusing on the interconnectedness of all life and sustainable practices. Highlight local Indigenous knowledge relevant to the field trip location, such as the use of cedar in traditional practices and respect for the forest as a living system.

**Field Trip Preparation**

* **Safety and Ethics Briefing:** Discuss field safety, respectful conduct, and the importance of minimizing human impact (leave no trace).
* **Research Teams:** Divide students into small research teams with specific roles (e.g., plant surveyors, animal trackers, decomposer hunters). Each team will have tasks to complete during the trip.
* **Equipment Check:** Ensure students have necessary gear: field journals, data sheets, measuring tapes, cameras, pH testers, and magnifying glasses.

**Field Trip Experience**

**Location:** Local temperate rainforest (e.g., Goldstream Provincial Park, Capilano River Regional Park, or other nearby sites).

**Field Activities:**

1. **Indigenous Knowledge Walk and Talk**
	* **Focus:** If possible, have an Indigenous knowledge keeper or park interpreter discuss traditional ecological knowledge and the cultural significance of the rainforest.
	* **Task:** Students reflect on how Indigenous practices contribute to sustainable ecosystem management.
2. **Primary Producers Investigation**
	* **Focus:** Examine tree species like Western red cedar, Douglas fir, and understory plants. Measure tree height, canopy cover, and light levels.
	* **Task:** Students record data on plant growth, identify plant species, and analyze how sunlight, water, and soil quality affect growth.
3. **Wildlife Observation and Habitat Analysis**
	* **Focus:** Conduct a survey of animal signs such as tracks, scat, nests, and direct sightings. Observe birds, insects, and mammals in their natural habitats.
	* **Task:** Students document animal interactions (e.g., birds feeding on insects) and habitat needs. Discuss the roles these animals play in the ecosystem.
4. **Decomposition and Nutrient Cycling Study**
	* **Focus:** Investigate nurse logs, fungi, and decomposers. Measure decomposition rates using temperature probes or pH strips.
	* **Task:** Teams record observations of decomposers, describe their roles in breaking down organic matter, and discuss how nutrients are cycled back into the soil.
5. **Succession and Regeneration Analysis**
	* **Focus:** Identify signs of ecological succession, such as young saplings in open areas. Discuss the impact of disturbances (e.g., windstorms, logging).
	* **Task:** Students create a succession timeline based on observed evidence, showing the stages from bare ground to mature forest.

**Post-Field Trip**

**Reflection:**

Discuss the field trip with students on bus back. Ask for input, things that stood out, surprised them, stuff they already knew.

**Assessment**

* **Field Journals:** Evaluate for thoroughness, accuracy of observations, and reflection on Indigenous knowledge.

**Materials Needed**

* Field journals and data sheets
* Measuring tools (tape measures, pH strips, temperature probes)
* Cameras or smartphones
* Magnifying glasses for detailed observation
* First aid kit and appropriate outdoor gear

**Special Accommodations**

* Provide visual aids and extra guidance for students with diverse learning needs.
* Ensure safe, accessible pathways for students with mobility challenges.
* Allow alternative formats for presentations (e.g., video, audio) to accommodate different learning styles.