Lesson Plan Template for Outdoor Learning

Grade/Grade Band: 7th Grade	**Topic: Identifying living Organisms in an Ecosystem.**
Brief Lesson Description: Students will learn how to use iNaturalist to identify and classify the flora and fauna in their school campus.	
How will you use the outdoors: The students will need to be outdoors to collect their data.	
Safety concerns, hazards and mitigation strategies: Consider student health alerts (asthma, allergies to insects, plants), stairways and tripping hazards, and exposure.	
NGSS Performance Expectation(s) (if have a clear PE paste here) **Students will recognize that organisms around their school community also exist in other parts of the world.** Students will have to associate that organisms require certain organisms that need certain environmental conditions to survive/exist in similar ecosystems throughout the world. **MS-LS2-1** Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.	

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyze and interpret data to provide evidence for phenomena. (MS-ESS2-3) Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2)	**LS2.A Interdependent Relationships in Ecosystems** Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1) In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other	**Patterns** Patterns in rates of change and other numerical relationships can provide information about natural and human designed systems. (MS-ESS2-3) **Cause and Effect** Cause-and-effect relationships may be used to predict phenomena in natural or designed systems. (MS-ESS3-1)

	resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2-1) Growth of organisms and population increases are limited by access to resources. (MS-LS2-1) Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2) Beneficial interactions vary across ecosystems; the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2)	

Phenomenon: Students will infer that there is a variance of specific species.

Learning Target/s for this lesson (use Evidence Statements for science):

MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

What will youth learners be able to *know* at the end of this lesson?

- Students will be able to take photo images of organisms and load them on to iNaturalist to identify by name.
- Students will research areas in the world where organisms exist and make entries in science journals.
- Students will have to identify similar factors in different ecosystems that allow organisms to live.
- They can design an ecosystem based on the photo images.

Prior Student Knowledge and Possible Preconceptions/Misconceptions (how will it be assessed?)

What will youth learners be able to *do* at the end of this lesson?
Students will be able to identify at ≥ 10 animal and plant species in and around their school campus.

What evidence should we gather and discuss about student learning? How will youth learner thinking be captured? (seeing, hearing, doing, writing)

Humans depend on and benefit from the repeated cycling of matter between living and nonliving parts of ecosystems. Human activities and practices alter cycles and processes in natural systems, disrupting physical and biological components of ecosystems, and causing shifts in populations of organisms. Human lives, communities, and societies, and activities (e.g., agriculture, fisheries, and industry) depend on and benefit from natural systems cycles among the biosphere, hydrosphere, atmosphere, and geosphere. Human-caused changes to natural systems cycles and processes can affect the health, viability, and functioning of those systems and the organisms that depend on them.

Evidence about student learning includes:

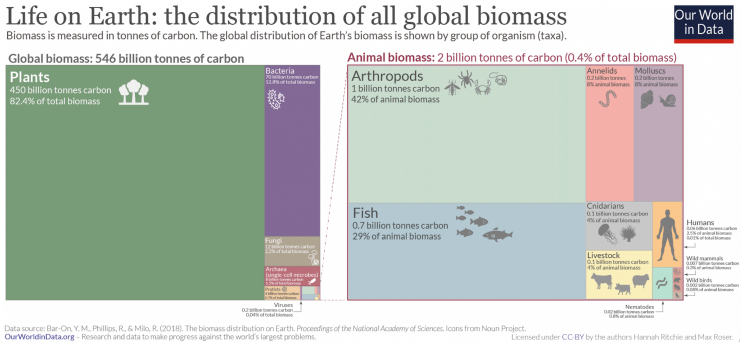
Students will analyze data collected and look for patterns of population numbers by constructing a bar graph and increasing complexity.

Youth learner thinking will be captured by:

- INaturalist App
- Data Collection Graphic Organizer

Note: keep in mind your responses above

<table>
<tr><th>5E Stage</th><th>Student Does</th><th>Teacher Does</th></tr>
<tr><td>Engage

Prior knowledge of concepts to be learned. Introduction of phenomena and opportunity for students to ask questions.</td><td>Hook: Looking at the chart titled “Life on Earth; the distribution of all global biomass”, write one thing you observe and one question you may have.</td><td>Sample Data Chart:
 
</td></tr>
<tr><td>Explore

Concepts students explore to build understanding of the “explain” concept.</td><td>Group Norms:
Photographer
Recorder
Spotter</td><td><table>
<tr><td>Plants</td><td>Shrub</td><td>Trees</td></tr>
<tr><td>Tally Marks
iNaturalist Infor</td><td></td><td></td></tr>
<tr><td>Insects</td><td>Birds/Reptiles</td><td>Mammals</td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>Explain

Concepts students</td><td>iNaturalist app-perhaps have students show teacher an example plant or animal entry.</td><td>Check each group and make sure they are collecting data from their iNaturalist app.</td></tr>
</table>

know or understand (students do the explaining), students explain what they are starting to understand about the phenomenon.		
Explore/Explain If more than one		
Elaborate Concept application.		
Evaluate Concept(s) students understand at the end of the learning sequence, including explanation of how and why the phenomenon occurs using understanding of 3D science ideas/concepts.		

Reflection questions after teaching lesson

- What was the level of student engagement indoors? Outdoors?
- To what extent did the students learn what was intended? How do you know? As part of your answer, please indicate:
    - In what ways were your teaching methods effective? How do you know?
    - In what ways were your activities effective? How do you know?
    - In what ways were the instructional materials effective?
    - How did any special considerations of accommodations affect the lesson?
- Identify an individual or group of students who had difficulty in today's lesson. How do you account for this performance? How will you help this (these) student(s) achieve the learning objectives?
- Identify an individual or group of students who did especially well in this lesson today. How do you account for this performance?

Based on the observation notes and student data analysis... What modifications will increase student learning for the second implementation/*future implementation*? (Once modifications are determined, please revise the original 5E lesson plan for the 2nd/3rd implementation.)

Modification to increase student learning	Evidence from the activity and student data that directly supports the modification listed.

Appendix

Engage

Why should students care? How does it relate to their lives? How will prior knowledge/experience be activated? Place the standards/s into a phenomenon. Reach their emotions and get their attention. The purpose for the ENGAGE stage is to pique student interest and get them personally involved in the lesson, while pre-assessing prior understanding. During the ENGAGE stage, students make connections between past and present learning experiences, setting the organizational groundwork for upcoming activities (NASA e-clips)

Explore (is hands-on)

Youth learners have the opportunity to get directly involved with phenomena and materials. As they work together in teams, youth learners build a set of common experiences which prompts sharing and communicating. The lead learner acts as a facilitator, providing materials and guiding the students' focus. The youth learners' inquiry process drives the instruction during an exploration. Youth learners are actively learning through inquiry-based science instruction (NASA e-clips).

Explain (reading info text or article)

The purpose for the EXPLAIN stage is to provide youth learners with an opportunity to communicate what they have learned so far and figure out what it means. EXPLAIN is the stage at which learners begin to communicate what they have learned. Language provides motivation for sequencing events into a logical format. Communication occurs between peers, with the facilitator, and through the reflective process. Use of interactive notebooks, vocabulary, and sentence stems support explain processes (NASA e-clips).

Elaborate/Extend

The purpose for the EXTEND stage is to allow students to use their new knowledge and continue to explore its implications. At

this stage youth learners expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways (NASA e-clips).

Evaluate

EVALUATION is done at each stage in the 5E cycle. EVALUATE, the final "E", is a diagnostic process including forms such as rubrics, teacher observation, student interviews, portfolios, project and problem-based learning products. Youth learners will be excited to demonstrate their understanding through journals, drawings, models and performance tasks.