

## Tyndale Lesson Plan Template

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<b>Lesson Title: Environmental Interactions</b>	<b>Unit of Study: Understanding Life Systems - Interactions In The Environment</b>
<b>Grade Level: 7</b>	<b>Subject: Ecosystems</b>
<b>Lesson Overview:</b> <i>Students will;</i> <ol style="list-style-type: none"><li>1. Investigate biotic and abiotic interactions within the ecosystem through an interactive activity.</li><li>2. Build their own plasticine ecosystem.</li><li>3. Research factors that may affect the balance between different components of the ecosystem.</li></ol>	

### **Part 1: Lesson Goals and Assessment**

<b>Ontario Curriculum Overall Expectations:</b> <ol style="list-style-type: none"><li>2. investigate interactions within the environment, and identify factors that affect the balance between different components of an ecosystem;</li><li>3. Demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment.</li></ol>
<b>Ontario Curriculum Specific Expectations:</b> <ol style="list-style-type: none"><li>2.2 design and construct a model ecosystem and use it to investigate interactions between the biotic.</li><li>2.3 use scientific inquiry/research skills to investigate occurrences that affect the balance within a local ecosystem</li><li>2.4 use appropriate science and technology vocabulary, including sustainability, biotic, ecosystem, community, population, and producer, in oral and written communication</li><li>2.5 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes</li><li>3.2 identify biotic and abiotic elements in an ecosystem, and describe the interactions between them.</li></ol>
<b>Big Ideas/ Enduring Understandings:</b> <ul style="list-style-type: none"><li>- There are interactions between biotic and abiotic elements in an ecosystem.</li><li>- There are factors that may affect the balance between different components of the ecosystem (e.g. a forest fire, or a drought).</li></ul>
<b>Essential/Key Critical Questions:</b> <ul style="list-style-type: none"><li>-Could it be detrimental for the environment to allow naturally caused fires in national parks to burn to their natural end?</li><li>-How could human activities and natural occurrences contribute to droughts?</li><li>-What could happen in a moment of drought to our ecosystem's biotic and abiotic elements or relationships?</li><li>-How could biotic and abiotic elements be distinguished?</li><li>-Could factors such as faith and culture contribute to the differentiation of these elements?</li></ul>
<b>Student Learning Goal:</b> <p>We are learning to;</p> <ol style="list-style-type: none"><li>1. Understand the interactions of our ecosystem between biotic/abiotic elements.</li><li>2. Investigate into factors that may affect the balance between different components of the ecosystem.</li></ol>

**Student Success Criteria:**

We are able to;

1. Explain the difference between biotic and abiotic elements through their plasticine ecosystem model.
2. Research, present and explain factors that may affect the balance between different components of the ecosystem.
3. Demonstrate effective group work, respect and collaboration with peers during assigned activities (think-pair-share, modeling ecosystems, researching, presenting).

**Necessary Prior Knowledge, Skills, and/or Previous Lesson:**

- Understand the word ecosystem due to previous grades and lessons
- Understand the meaning of biotic and abiotic elements due to previous lessons
- Understand how to research topics based on previous lessons, grades and experience

**Instructional Strategies:**

- Mind mapping (Learning Goal and success criteria)
- Think-pair-share
- Jigsaw activity (research)

**Assessment:**     Assessment *as* learning     Assessment *of* Learning     Assessment *for* Learning

Assessment *for and as* Learning= I will give descriptive feedback and coach my students for improving through multiple opportunities such as small group discussions (oral feedback on oral answers), on their ecosystem models and on their research information. In addition, I will give students time to respond to feedback before finalizing their individual work. Students will be self-assessing their work, and assessing their peers during TPS by ensuring they met all success criteria, and by responding to the teacher's descriptive feedback.

**Equity/Diversity/Indigenous Perspectives**

- Consider different religions and cultures such as the indigenous perspective on biotic/abiotic elements (non-existing due to their belief of existing spirits in all element of the ecosystem)
- Consider special education: ADHD students who require movement and manipulatives (creating a model ecosystem/presenting/researching)

**Part 2: Lesson Preparation****New Vocabulary:**

- Ecosystem
- Biotic
- Abiotic
- Drought
- Fire
- Research
- Factors

**Learning Environment/Safety Concerns and Precautions:**

- Indoor lesson
- Safe distance between group layouts
- Washing hands after plasticine use
- No dangling laptop chargers

**Materials/Resources/Classroom Arrangement/Necessary Preparation:**

- Group arrangement (4 students per group)
- Plasticine (green, brown, black, yellow, blue)
- Cardboard
- Laptops
- Model ecosystem designed by teacher

**References/Credits:**

*What are the sources that will be used for lesson development?*

*Include any worksheets developed/used within the lesson (with credit reference if applicable)*

ELL learners:

<http://www.edu.gov.on.ca/eng/document/esleldprograms/guide.pdf><http://www.edu.gov.on.ca/eng/document/esleldprograms/guide.pdf>

***Part 3: Lesson Design (3-Part Lesson)***

<p>Length of Period: 60 mins</p>	<p><b>Differentiated Instruction</b></p> <p><b>Modifications</b></p> <p><b>Accommodations</b></p> <p><b>Ongoing Teacher Assessment</b></p>
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**Minds On (Before):**

Estimated Time: 15 - 20 mins

To begin the lesson, ask students the following questions to connect the lesson about ecosystems to their prior and personal experience;

*-Who has been on a stroll in a forest, or next to a pond, or next to a mountain?*

-Students will put their thumbs up

-Have students close their eyes and visualise that moment

*-Ask students what could be some different elements of an ecosystem?*

*(students could name different elements such as trees, lakes and animals)*

*-Ask students how they would classify these elements that they visualized*

*(students could mention categories such as living and non-living)*

-Clarify to students that there are fancy scientific terms that describe living (biotic) and nonliving (abiotic) elements in our environment (ecosystem)

-An ecosystem is a system of ecology. Ecology is the study of the relations of organisms to one another and to their physical surroundings

\*Highlight the objective of the lesson (Learning goal identified in part 1)

\*Present success criteria (Identified in part 1)

→ Demonstrate an example of an ecosystem using a plasticine model built by the teachers vision of an ecosystem (elements included: Mountains, rivers, trees, grass, sun, elephants)

**Activity with questions (2 min)**

Pre-activity:

*-Ask students what they observed/noticed in terms of the interactions between living/non-living in their visuals/real life experiences (students could think that survival is one of the purposes of these interactions)*

Activity:

-Have students discuss their interactions with an elbow partner before building their ecosystem as a group

-Build an ecosystem model including these components: biotic/abiotic.

-Material: Plasticine and cardboard base

Special education Accommodation

ELL:

- 1) provide books, visual representations, and concrete objects
- 2) Celebrate cultures in a classroom and their perspectives on science

ADHD:

- 1) Structured environment (post class schedule)
- 2) Provide private work space
- 3) Provide directions (write, repeat and simplify)
- 4) Use technology as learning aides (manipulatives, computers)
- 5) Provide specific learning goals and success criteria
- 6) Be consistent with expectations and awards

Collecting Assessment Information

-Record anecdotal notes (while walking around from group to group)

-Ipad: Google form that records data to google sheets (Yes/ no questions on team collaboration, content, presentation, research skills) → directly associated to group members and/or individual feedback

Differentiated instructions:

-Groups students based on skill levels (2 strong, 2 weaker)

-Hands-on activities (plasticine modeling)

<p>As students are building their ecosystems, these questions are relevant and used to deepen their understanding and allow for discussion;</p> <p>-What do you think could be considered as “biotic” (living) components of this ecosystem?</p> <p>-What do you think could be considered as “abiotic” (non-living) components?</p> <p>*Discuss the indigenous perspective of their belief system - Everything in the environment has a spirit, thus they could be all considered as living entities (debate).</p> <p>-How could these components affect each other?</p> <p>-What could be some of the interactions that are occurring in the teacher’s model ecosystem?</p> <p>(30 sec) - Summarize the main idea of your activity. There are biotic and abiotic elements in an ecosystem that interact and depend on each other and their surroundings for survival.</p>	<ul style="list-style-type: none"> <li>-Research project</li> <li>-Group presentations</li> <li>-Think-pair-share</li> <li>-Offer topic choices <ul style="list-style-type: none"> <li>1) Forest fires</li> <li>2) Droughts</li> <li>3) Infestation of one kind of species</li> </ul> </li> </ul>
<p><b>Action (During):</b> <span style="float: right;">Estimated Time: 30 mins</span></p> <p><b>Interactive activity</b></p> <p>-Students will be placed in 3 groups of 4 students which will be selected randomly from <i>Flipity</i> (website that selects student names randomly and places them into groups)</p> <p>-Students will have the choice to select from the following list of research topics;</p> <ol style="list-style-type: none"> <li>1) Forest fires</li> <li>2) Droughts</li> <li>3) Infestation of one kind of species</li> </ol> <p>-Ask students to answer the following questions in their presentations in regards to their topic (post them on the board);</p> <p>What could be possible factors that affect the balance between different components of the ecosystem (biotic/abiotic)? How could they affect these components?</p> <p>-Give students 15 minutes to research information on this topic using the classroom laptops and discover possible answers.</p> <p>-Remind students to select appropriate websites (not wikipedia) by using known organizations and the skills we have learned for research in previous lessons</p> <p>-Have students create a short slideshow with their research (document online)</p> <p>-The teacher will oversee the gathering of research notes before they are presented</p>	

<p>-Have all 3 groups of students present in 2 minutes their conclusions/answers</p> <p>-Ask students and post on a google document the following questions and have them discuss them in their previously selected groups;</p> <p><i>-What could be the purpose of these interactions?</i></p> <p><i>-Would animals, plants or even humans be able to survive without these interactions?</i></p> <p><i>-Could it be detrimental for the environment to allow naturally caused fires in national parks to burn to their natural end?</i></p> <p><i>-How could human activities and natural occurrences contribute to droughts? What could happen in a moment of a drought?</i></p> <p><i>-How could biotic and abiotic elements be distinguished? Could factors such as faith and culture contribute to the differentiation of these elements?</i></p>	
<p><b>Debrief/Consolidation (After):</b> <span style="float: right;">Estimated Time: 10 mins</span></p> <p><b>Consolidate what has been previously discussed on;</b></p> <ul style="list-style-type: none"> <li>-The difference between biotic/abiotic elements (suggestions: living/non living, reproduction, oxygen, etc...)</li> <li>- Examples of biotic/abiotic interactions in the ecosystem (suggestions: giraffes and water, sun and trees/bacteria, etc...)</li> <li>- Examples of factors that may affect the balance between different components of the ecosystem. How? (suggestions: Drought and fire)</li> </ul> <p><b>Task;</b></p> <ul style="list-style-type: none"> <li>- Gather all joted research notes into one google drive/presentation document from all groups (everyone will have access to see this document throughout the course)</li> <li>- Include:       <ol style="list-style-type: none"> <li>1) difference and examples of biotic/abiotic elements</li> <li>2) Your assigned topic on the factors that may affect the balance between ecosystem components. Explain.</li> </ol> </li> <li>- Use this document as reference when needed</li> </ul>	
<p><b>Lesson Extension/Homework/Future Responsibilities:</b></p> <p>-Read an indigenous story called "This Land is My Land" by George Littlechild and discuss the importance of our ecosystem/environment in relation to the indegenous perspective. A venn diagram can be used to compare our western perspective with the indegeonous view.</p>	

