

<b>Biodiversity</b>	<b>Grade 7 Interactions in the Environment</b>
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<h2 style="margin: 0;">Lesson Plan</h2>	Cross Curricular	French as a second language
	Safety Notes	Use the appropriate space and equipment for this game

<p><b>Big Ideas</b></p> <ul style="list-style-type: none"> <li>• Ecosystems are made up of biotic and abiotic elements, which depend on each other to survive</li> <li>• Ecosystems are in a constant state of change. The changes may be caused by nature or by human activity</li> </ul> <p><b>Overall Expectations</b></p> <ul style="list-style-type: none"> <li>• Investigate interactions within the environment, and identify factors that affect the balance between different components of an ecosystem</li> <li>• Demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment</li> </ul>	<p><b>Specific Expectations</b></p> <p><b>3.1</b> demonstrate an understanding of an ecosystem as a system of interactions between living organisms and their environment</p> <p><b>3.2</b> identify biotic and abiotic elements in an ecosystem, and describe the interactions between them</p> <p><b>3.7</b> explain why an ecosystem is limited in the number of living things that it can support</p> <p><b>3.8</b> describe ways in which human activities and technologies alter balances and interactions in the environment</p>
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**Description**

In this lesson, students will play a game which demonstrates the balance of an ecosystem and how the changes in an ecosystem will affect all of its components. By introducing different scenarios in the game, students will also have the opportunity to learn about predator and prey relationships, native and non-native species, and evasive species.

<p><b>Materials</b></p> <p><b>Introduction</b></p> <ul style="list-style-type: none"> <li>• Jenga Game</li> <li>• Paint (green, blue, brown, grey, purple, black)</li> </ul> <p><b>Action</b></p> <ul style="list-style-type: none"> <li>• Nerf Ball (or rolled up socks)</li> <li>• Coloured pinnies</li> <li>• White board and markers</li> </ul>	<p><b>Accommodations/Modifications</b></p> <ul style="list-style-type: none"> <li>• To accommodate students with mobility issues, you can have a student act in an observer role where they record the data from the game</li> <li>• Play the game without any additional scenarios to familiarize students with the game</li> </ul> <hr/> <p><b>FSL Activities</b></p> <ul style="list-style-type: none"> <li>• Semantic Map</li> <li>• Word Wall</li> </ul>
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## Introduction

### FSL Activity: Semantic Map

In order to gauge the level of student understanding with ecosystems, start the lesson with a semantic map. To do this activity, a central word is chosen, in this case “Ecosystem”. Using the provided space, students then record other words that are associated with the central word. Under the associated words, students will expand on what they know by writing ideas, events, characteristics or examples that pertain to that word. This can be expanded on by having students share their ideas and recording them on the chalkboard. These words can then be organized based on categories provided by the teacher if desired. The effectiveness of this activity lies in its emphasis on making connections. By seeing how the words are related, students will form a deeper understanding of the central word. (Macceca & Brummer, 2010)

### Science Activity

To introduce the balance of an ecosystem and its reliance on each part, students will begin the lesson by playing a game of biodiversity Jenga. In this game, the Jenga blocks get painted different colours, representing the biodiversity of an ecosystem:

- Green = Vegetation (plants, trees, moss, weeds, etc.)
- Blue = Water (lakes, rivers, rain, snow, etc.)
- Brown = Fauna (mammals, birds, fish, reptiles, amphibians, etc.)
- Grey = Shelter (rocks, soils, hills, tree trunks, etc.)
- Purple = Humans (human development, homes, factories, etc.)
- Black = Invasive species (Emerald ash borer, zebra mussel, purple loosestrife)

To demonstrate how each component of the ecosystem is reliant on each other, there are three scenarios for the students to play. As students play, the scenarios will guide them in removing or adding specific blocks.

For example, in one scenario hunters remove caribous from the ecosystem, which is represented by brown Jenga blocks. This results in the decline of the wolf population, so more brown blocks are removed. With the wolves gone, the rabbit population grows so the brown blocks are added to the top, which in turn causes a decrease in vegetation and the removal of green blocks. When the tower inevitably collapses, it represents the collapse of the ecosystem, emphasising how affecting a single component of an ecosystem can cause a series of consequences for its biodiversity.

An overview of the game, the scenarios and related student questions are included with the ‘*Biodiversity Jenga*’ handout.

## Action

### Science Activity

Students will further enhance their understanding of a healthy ecosystem by playing the game Oh Deer, for which the included handout provides a step-by-step breakdown of how to play. The game itself plays best outdoors but can be played in any open space such as a gym or even the classroom with the tables moved aside.

In this game, students are divided into four groups, one of which take on the role of an indigenous species, and the other three groups represent food, water, and shelter. When playing the game, players who are indigenous species have to choose what resource they require, and go collect that resource.

Numerous rounds are played in this game, which allows the students to observe how the relationship between a species and its resources are directly linked. There are a finite amount of resources and when they are plentiful, species that depend on them thrive. Yet as the species thrive, their numbers increase, which puts a strain on the resources they have available to them. When the resources available decrease, so does the population of the species depending on it. At this stage, the resources available surpass the needs of the species once again and the cycle continues. This ebb and flow in species and resource availability will be obvious to students when they play the game.

As this game is played over a number of years, the data from the game can be used to make meaningful graphs that further demonstrate this relationship. There are also three scenarios that can be played using the same steps which explore what happens when there are predators, non-indigenous species or evasive species introduced to the ecosystem.

Details for the game are provided in the *'Oh Deer Game'* handout.

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## Consolidation/Extension

### ESL Activity: Word Wall

To finish the lesson, create a word wall using vocabulary words gained while playing the game "Oh Deer". In this take on the word wall, vocabulary words are provided to the student and they draw an image that they associated with that word. By drawing the image, students will be able to form a deeper connection to its meaning and have an easier time remembering those key vocabulary terms. This becomes a sort of vocabulary word bank that students can refer to for key terms throughout the rest of the unit. This activity will target student's creativity so sharing word walls will provide students with many examples of what their word can mean. (Macceca & Brummer, 2010)

### **FSL Activity: Semantic Map**

It is also possible to return to the semantic map at this point. Having played both the Biodiversity Jenga and Oh Deer Game, students should have gained a deeper understanding of ecosystems. They can reinforce this by adding further ideas to their semantic map, or creating a new one if they have a large number of concepts they want to add. This is an effective form of assessment *as learning* as students are asked to reflect on what they've learned during this activity. (Macceca & Brummer, 2010)

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### **Assessment**

As students re-examine their semantic maps, they are participating in assessment *as learning*. Teachers can choose to evaluate the FSL components of these games so long as students are informed on what they're being evaluated on. Ensure that the French component is assessed as a French mark and that the science component is assessed as a science mark. Students should not lose science marks for improper use of French or vice-versa.

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### **Additional Resources**

The following documents are required for this lesson:

- Jenga Biodiversity handout
  - Oh Deer Game handout
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### **Works Cited**

Macceca, S., & Brummer, T. (2010). *Stratégies de lecture en mathématiques, en sciences et en sciences sociales*. Montréal, Québec, Canada: Chenelière éducation.