CREATE A TSINGY FOOD WEB

2-3rd Grade Science

Learning Goals: The students know what an environment is and are able to identify and describe the roles of different animals (predator, prey, and scavenger).

Students will be able to:
- Describe a tsingy food web
- Identify the connections between plants and animals in the tsingy ecosystem
- Describe the roles of prey, predator and scavenger and their importance
- Identify that every animal within an environment has a specific niche or job to do
- Create a food web to demonstrate connections between wildlife in a Malagasy forest

Materials needed:
- Bounce the White Sifaka Tsingy Poster
- Create a Tsingy Food Web Activity Cards (1 set for every group of 8-16 students)
- Large ball of yarn or string (one for every group of 8-16 students)

ACTIVITY

1. Take the class to a gym, schoolyard or field. Students may sit or stand during the activity. Divide students into groups of 8-15. Select a leader for each group and instruct the group to sit or stand in a circle.

2. Distribute a set of activity cards to each group. Each student should have one plant or animal card. The group leader should have the “sun” card. Give students time to read the description on their card (To play the game students will first need to know how plants and animals are connected in food chains).

Les enjeux de l'éducation de l'enviropédagogie en Malagasy forest.
3. Start the Game. Show the ball of string and explain that it represents the connections/transfer of energy between plants and animals within the food web. Give a ball of string to each of the group leaders. They will represent the sun. Explain to the group(s) that the leaders will start the game since all energy starts with sun.

4. The sun (group leaders) should hold the end of the string and read the description of the activity card. The student that passes the ball of string should explain this connection (i.e. “I am the sun. Plants and trees depend on me to grow.”) They should then hold onto the end of the string and pass the ball of string to a student holding a plant card.

5. The student representing a plant (for example the baobab tree) will repeat the activity. They might pass the string to the student representing the rousette bat or mouse lemur.

6. Students should continue reading the descriptions on the cards and passing the ball of string to other living things in the web, explaining their connections along the way. When all students have finished the game, they should each be holding onto a piece of the string and be connected in a web of life. Students should keep the string tight, but not so tight that it breaks! Play continues until everyone is connected and holding onto the string. Some plants and animals might have more than one connection.

7. With the web in place discuss the following:

   A. Show the power of the sun. Remind students that the sun, represented by the group leader, is the source of all energy so it is very important! What would happen if it stopped shining? Obviously it would be dark, but without the sun it would be dark and the earth would cool. The wind would stop blowing, plants

---

**Analytical Writing**

Everything lives in an environment. Describe the type of environment in which we live. How do we get the food we need to survive?
would die. Eventually the animals that depended on plants would die as well. Ask everyone to be still. Tell group leaders to gently tug on the string. Tell the students that when they feel the tug they should begin to tug gently. Instruct them to watch as the tugging moves through the web. Eventually the whole web will be shaking, because everything is connected to everything else.

B. Role Call: Call out different niches/roles represented in the food web (e.g. predator, prey, scavenger, decomposer). Students representing each should raise their hand and call out the name of the plant or animal they represent. You can try the same technique calling out energy levels (producers, consumers, scavengers, etc.) or eating habits (carnivores, herbivores or omnivores).

C. Explore other connections. It’s easy to understand how the sun influences the connections between plants and animals. But what would happen if all of the lemurs disappeared? Try the game again with all of the lemurs gently tugging on the web. As each plant or animal in the circle feels the tug he/she should call out the plant or animal they represent. Try it again with a different plant or animal.

8. Discuss impacts to the web caused by human activities or natural events.

Present these or other scenarios:

● Scenario #1: The scrubland in the tsingy is burned to create more pasture for cattle.
● Scenario #2: A cyclone knocks down large baobab and tropical almond trees.
● Scenario #3: The forest on the edge of the tsingy is harvested to build new homes.
● Scenario #4: Farmers, concerned about their chickens, kill the mongoose in the area.
● Scenario #5: Local residents harvest and sell all of the baobab fruit.
WRAP-UP

Return to the classroom and use the discussion points and questions below to talk about these activities:

- Using the tsingy food web, describe how plants and animals are connected to each other in the tsingy ecosystem. Plants and animals depend on each other. Animals eat the plants for food and the plants often depend on animals to spread seeds and help them re-grow.
- What changes occur when organisms disappear from an ecosystem? Many changes can occur and students will give a variety of answers. They should conclude that the disappearance of one organism can impact other organisms in an ecosystem.
- Use your knowledge of the tsingy to make predictions about a habitat or ecosystem near your school. How do these organisms depend on each other? How are you connected to this habitat or ecosystem? This is an open-ended question. All answers are acceptable. However, like the tsingy, students should conclude that all organisms are connected and depend upon each other for survival.

ZOO EXTENSION

Try this activity during your next field trip to your local zoo—Students can categorize animals they see at the zoo as predator, prey, scavenger, etc. and identify particular animal roles in the food chain.

ART EXTENSION

Have students recreate Bounce’s tsingy environment from clay. Using self-drying clay, instruct students to form and glue clay pinnacles on a masonite board cut to size. When the clay dries, students can paint it using acrylic paints. Trees can be constructed from green crumpled tissue
CREATE A TSINGY FOOD WEB

paper and glue then attached. Once dry, students can make clay characters from the book (bats, snakes, cockroaches, sifaka, fossa, etc.) and add to the tsingy environment. Multiple grades can complete different sections to create a large stone forest.

ROLE OF TSINGY SPECIES

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>ROLE IN FOOD CHAIN</th>
<th>ENERGY LEVEL</th>
<th>EATING HABIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Kalanchoe</td>
<td>Plant</td>
<td>Producer</td>
<td>N/A</td>
</tr>
<tr>
<td>Blue Butterfly</td>
<td>Prey / Pollinator</td>
<td>Consumer</td>
<td>Herbivore</td>
</tr>
<tr>
<td>Longicorn Beetle</td>
<td>Prey</td>
<td>Consumer</td>
<td>Herbivore</td>
</tr>
<tr>
<td>Sickle-billed Vanga</td>
<td>Prey / Pollinator</td>
<td>Consumer</td>
<td>Carnivore</td>
</tr>
<tr>
<td>Ring-tailed Mongoose</td>
<td>Predator</td>
<td>Consumer</td>
<td>Carnivore</td>
</tr>
<tr>
<td>Lowland Red Forest Rat</td>
<td>Prey</td>
<td>Consumer</td>
<td>Herbivore</td>
</tr>
<tr>
<td>Gecko</td>
<td>Prey / Predator</td>
<td>Consumer</td>
<td>Carnivore</td>
</tr>
<tr>
<td>Millipede</td>
<td>Prey / Scavenger</td>
<td>Consumer</td>
<td>Herbivore</td>
</tr>
<tr>
<td>Tsingy Scorpion</td>
<td>Prey / Predator</td>
<td>Consumer</td>
<td>Carnivore</td>
</tr>
<tr>
<td>Decken’s (White) Sifaka</td>
<td>Prey / Pollinator / Seed Disperser</td>
<td>Consumer</td>
<td>Herbivore</td>
</tr>
<tr>
<td>Rousette Bat</td>
<td>Prey / Pollinator / Seed Disperser</td>
<td>Consumer</td>
<td>Herbivore</td>
</tr>
<tr>
<td>Baobab Tree</td>
<td>Plant</td>
<td>Producer</td>
<td>N/A</td>
</tr>
<tr>
<td>Mouse Lemur</td>
<td>Prey / Predator / Pollinator / Seed Disperser</td>
<td>Consumer</td>
<td>Omnivore</td>
</tr>
<tr>
<td>Tropical Almond</td>
<td>Plant</td>
<td>Producer</td>
<td>N/A</td>
</tr>
<tr>
<td>Red-fronted Brown Lemur</td>
<td>Prey / Pollinator / Seed Disperser</td>
<td>Consumer</td>
<td>Omnivore</td>
</tr>
</tbody>
</table>
To demonstrate the students’ understanding of food webs, ask them to create a food web with animals near their school or a personal food web that involves what they eat in one day.

**Florida State Standards**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3rd</td>
<td>SC.2.L.17.1, SC.2.L.17.2</td>
</tr>
<tr>
<td>3-4th</td>
<td>SC.3.L.17.1, SC.3.N.3.2</td>
</tr>
</tbody>
</table>

**National Science Standards**

- **2 and 3rd Grade Science**
  - Characteristics of organisms
  - Transfer of energy (food chains)
  - Organisms and environments
  - Changes in environments
  - Form and Function

**Next Generation National Science Standards**

- **2nd Grade:** Interdependent Relationships in Ecosystems (2-LS4-1)
- **3rd Grade:** Interdependent Relationships in Ecosystems (3-LS4-3)
SUN: I am the sun. Plants and trees depend on me to grow.

BLUE KALANCHOE: I am a Blue Kalanchoe (kal-en-co-ee). Butterflies lay their eggs on my leaves. Their larvae depend on my leaves for food after they hatch. I depend on butterflies to pollinate my flowers so I can grow.

BUTTERFLY: I am a butterfly. I depend on nectar from the Blue Kalanchoe to survive. When I feed I pollinate their flowers so they can grow.
LONGICORN BEETLE: I am a longicorn beetle. As larvae (grub,) I bore under bark and feed on dead or dying trees. I depend on them to survive. Sickle-billed Vanga depend on me for food.

SICKLE-BILLED VANGA: I am a vanga—a type of bird. My sickle-shaped beak is shaped to dig out insects from under tree bark. I depend on the longicorn beetle for food. To stay safe I nest in tall trees like baobab and tropical almond.

RING-TAILED MONGOOSE: I am a ring-tailed mongoose. I depend on red rats for food. By eating them, I keep their numbers from growing too large. This prevents them from eating too many plants, seeds and fruit.
CREATE A TSINGY FOOD WEB

LOWLAND RED FOREST RAT: I am a lowland red forest rat. I feed on fruit from the tropical almond. It depends on me to disperse its seeds. The red-tailed mongoose depends on me for food.

GECKO: I am a gecko. I feed on butterflies and other insects. Without them I would not survive. By feeding on them I keep their numbers from growing too large.

MILLIPEDE: I am a millipede. I feed on dead plants and animals and return their nutrients to the soil. Baobab trees, kalanchoe, and other plants depend on these nutrients to grow. Geckos, scorpions and red-fronted brown lemurs depend on me for food.
CREATE A TSINGY FOOD WEB

RED-FRONTED BROWN LEMUR: I am a red-fronted brown lemur. I depend on fruit, leaves, flowers, scorpions, insects and millipedes for food. Trees depend on me to pollinate their flowers and disperse their seeds.

TSINGY SCORPION: I am a carnivore (meat-eater.) I depend on small animals like spiders and geckos to survive. Red-fronted brown lemurs depend on me for food.

DECKEN’S SIFAKA: I am a Sifaka. I depend on the fruit from trees like the tropical almond. By spreading their large seeds I help them grow. Without me, birds and other animals that live in these trees would not survive.
ROUSSETTE BAT: I am a Roussette bat. I depend on fruit from baobabs and other trees for food. They depend on me to pollinate their flowers and disperse their seeds so they can grow.

BAOBAB TREE: I am a baobab tree. Roussette bats and mouse lemurs depend on me for food. I depend on them to pollinate my flowers and disperse my seeds so I can grow.
MOUSE LEMUR: I am a mouse lemur. I depend on fruit, pollen and nectar from the baobab tree for food. Baobabs depend on me to pollinate their flowers and disperse their seeds so they can grow.

TROPICAL ALMOND: I am a Tropical Almond Tree. Red rats feed on my fruit when they fall to the ground. They disperse my seeds so I can grow.