**Illuminating Food Webs: A Maker Jigsaw**

A jigsaw is a cooperative learning technique where each member of a group is assigned a different concept. To start, you will connect with members of other groups assigned the same letter as you to research and create a food web for a specific biome. After you create your food web, you get into your letter group to explain your food web and work as a team to assemble and light up a specific element in your web. You will receive a circuit template with has a letter and number listed. *Using this information, please circle your letter assignment and your number assignment in the table below*.

|  |  |
| --- | --- |
| Number Group Assignments -  *Illuminating a/an \_\_\_\_* | Letter Group Assignments -  *in a/an \_\_\_\_\_\_food web* |
| 1. energy source | A. ocean |
| 2. producer | B. tropical rainforest |
| 3. consumer | C. grassland |
| 4. decomposer | D. desert |

**Step 1: Making a collaborative circuit (Number Groups)**

Get into groups based on the number on your circuit template (1-4). Use the patterns on the back to connect your templates to the others in your group. The tracks on your templates should line up evenly. Use the copper tape, form a complete circuit.

Use the LED color provided for your group and place it anywhere on your circuit template that you want. However, keep in mind that this location will also need to be used as part of your food web.

Once your LEDs are connected, take a blank sheet of white paper to use as an overlay. In pencil, lightly mark an X on the overlay to indicate the placement of your LED for reference as you create your food web; this will be erased once the overlay is completed.

Finally, with your group trace the flow of electrons from the positive to the negative by drawing arrows onto your connected templates indicating the direction of energy flow.

**Step 2: Modeling a food web (Letter Groups)**

Work with the others in your letter group to research your assigned biome and create a food web. Use your notes, textbooks, and the internet to learn answer the questions below. A useful website for this research is <https://www.windows2universe.org/earth/ecosystems.html>

*Q1: Describe the biome you were assigned in terms of location, climate, physical features and the types of organisms that are present.*

*Q2: Using the information you have found list examples of the following from your biome:*

* *The biomes energy source provided the energy needed by producers to make their own food. The energy source from the biome I researched is:*
* *Producers are organisms that make their own food using energy from the environment. Examples of producers from the biome I researched are:*
* *Consumers are organisms that eat other organisms live. Examples of consumers from the biome I researched are:*
* *Decomposers are organisms that break down dead or decaying organisms. Examples of decomposers from the biome I researched are:*

Once you have answered the questions above, use it to create a food web on your overlay sheet. Use the X’s on your overlay to determine the placement of your food web element Draw the remaining parts of the food web were drawn around this element. Your food web is required to show an energy source, producers, consumers, decomposers, and arrows indicating the path of energy flow.

**Step 3: Presenting your biome model (Number Groups)**

After the food webs are complete, returned to your number groups to describe the food web that you created. Each member will take a turn presenting their food web to the group. As your group members present, fill in the chart below. *During the presentations, you will be asked to present a food web from one of your group members rather than your own so be sure to listen carefully*.

|  |  |  |
| --- | --- | --- |
| Biome Name | Description | Elements of the food web and their roles |
|  |  |  |
|  |  |  |
|  |  |  |

**Step 4: Illuminating your food webs**

*Q3: Describe the different forms of energy present in each of the circuits versus the food webs. What is similar about these systems? What is different?*

*Q4: Explain the ways in which arrows can be used to show the transfer of energy can be tracked as energy flows through both the circuit and the food web.*

**Step 5: Presenting your illuminated food webs**

In the final part of the lesson, your group will present your illuminated food webs to the class. Each group member will present a food web from a different member of the team. In the presentations, you will be asked to:

* describe the biome characteristics
* discuss the food web and the illuminated food web element and,
* explain the connections between the energy flow in the food webs as compared to the electric circuit.