Children's Environmental Literacy Foundation

LESSONS & ACTIVITIES

The Web of Life

An interdependence Activity

Estimated time for activity ~30 minutes

Objective

In ecosystems and communities all of the players, businesses and living species (aka stakeholders) are interconnected in a myriad of ways. This activity brings those often-unseen dynamics into view through a physically interactive and visual construction. Use the Web of Life to explore a natural or social system, or to build understanding around a specific issue.

Essential Questions

1. How can stakeholders come together to work on a common problem?
2. How do abiotic and biotic factors work together in an ecosystem?
3. Why is it important to think of interactions as a system?

Materials

- Ball of yarn
- Name card (name tags/note cards w/ a way to attach to each participant for labeling plant/animal or stakeholder)
- Markers
- Large open space for group to stand in a circle

Background

In ecosystems and communities all of the players, businesses and living species (aka stakeholders) are interconnected in a myriad of ways. This activity brings those often-unseen dynamics into view through a physically interactive and visual construction. Use the Web of Life to explore a natural or social system, or to build understanding around a specific issue. This activity will be demonstrated in two parts. The first part will demonstrate a natural ecological food web. The second part will demonstrate a social system and how different stakeholders may interact.

Participants

This activity is best when done in groups of 8 -10.

GRADE LEVEL

4TH - 12TH GRADE

CONNECTIONS TO THE BIG IDEAS OF SUSTAINABILITY

- INTERDEPENDENCE
- PLACE
- EQUILIBRIUM

CURRICULAR CONNECTIONS

- SCIENCE: SYSTEMS & SYSTEMS MODELS
- SOCIAL STUDIES: INDIVIDUALS, GROUPS, & INSTITUTIONS

Activity

Part 1 - Natural Ecosystem Food Web

1. Prior to starting the activity, pick a food web you would like your students to explore (example below). Make one name card for each component in the food web. Depending on how familiar the participants are with the plants/animals; you may need to write on the back of the card what the animal eats/who eats the plant.
2. Pass out plant/animal labeled name tags/note cards to each participant.
3. Have each participant stand in a circle facing the center.
4. Choose where to start the ball of yarn. You may decide to start it with an autotroph since that's where you would start in a food chain, but not necessary.
5. Whoever starts with the yarn decides who they interact with (i.e. who they eat or who eats them). Note** Traditional food webs show the transfer of energy from autotrophs to heterotrophs and on up through trophic levels, this activity does not represent the movement of the energy, simply that there is a connection between the two organisms.
6. Once the first person (organism) decides who they interact with, they toss the ball of yarn to that person (organism). Then the next person decides who they interact with.
7. This continues until all connections have been made. **Don't forget to tell the participants to hold on to the pieces of yarn they get passed for the entire activity.
8. Once you have made all necessary connections, lead a discussion about different parts of the food web and how everything is connected. Some ideas include:
    - Who are the producers?
    - Who are the consumers?
    - Difference between food chain and food web.
    - What are the trophic levels in the food web?
    - What are the feedback loops in this model?
    - What happens if one organism gets removed from the food web?
    - You can also demonstrate bioaccumulation and biomagnification using this model.

Part 2 - Social System Web of Life

1. Identify a specific issue in your school or community to focus on for this activity.
2. Brainstorm: Who are the stakeholders involved in this issue? (Who is involved in this system? What are the key variables?). Write each stakeholder down on a separate name card.
3. Each member of the group takes on the role of one of the stakeholders and wears the name card of that stakeholder.
4. Have participants stand in a circle facing the middle.
5. Start with one person describing how his/her role is related to the problem and how they would need to work with another stakeholder in the group.
6. As the first person describes their role and relationship, they hold on to the end of the yarn and pass the ball of yarn to that next person.
7. Continue identifying as many connections as possible and passing the ball of yarn between the related stakeholders. *Don't forget to hold on to a piece of the yarn as the ball gets passed along!*
8. When all of the participants have been connected to the whole system, you can stop or continue to explore the relationships further. When you've come to a good, messy stopping point, you will have a visual representation of the relationships. Place the entire web on the floor where the participants are standing and have everyone place their name card down at the points of their yarn strings.

Variations:

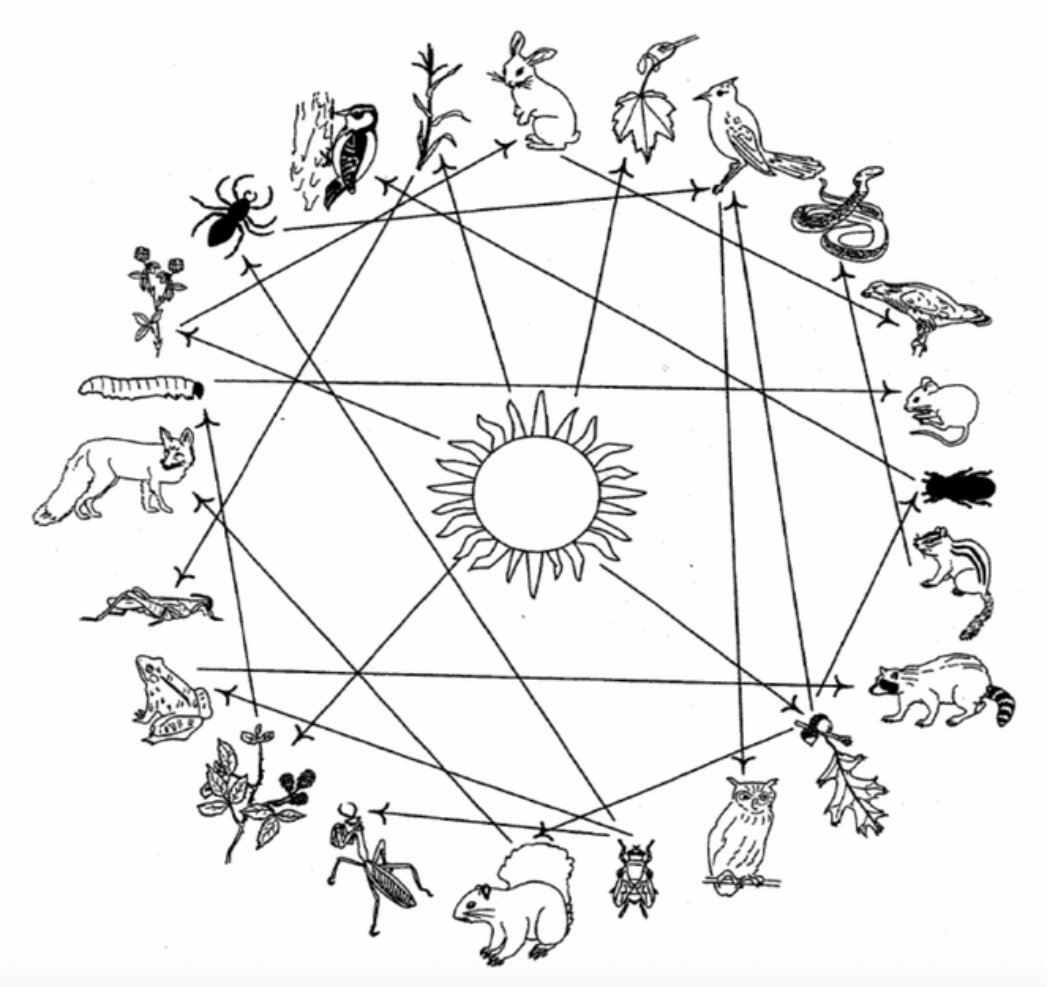
- This is a very flexible activity. You can use it to explore the relationships in a community, an ecosystem, or a problem.
- Simplify or add complexity. To keep it simple, make your focus more narrow and specific. For greater complexity, generalize the focus to make room for stakeholders in wider and wider circles of community.
- For younger students, use ready-made pictures of animals or names of people in a familiar community. Alternatively, break this activity into two parts. First, name and draw the stakeholders or players. In the second session, adopt stakeholder roles and build the web.
- The classic version of this activity is to build a food web that explores the questions, Who do I feed? and Who feeds me?
- On an organizational level, you can use this activity to understand a problem or issue (ie., work ethic, pencil supply). In this scenario, all of the variables are factors that impact work ethic or pencil supply within this organization or in the classroom.
- Put a current event topic or a historical moment at the center of the web.

Reflection Questions

1. What surprised you about the relationships in this system?
2. What relationships came up that you weren't aware of before?
3. Who is not included in this web that should be?
4. Where are there feedback loops in this model?
5. Are there any disconnects in this system?
6. Where are the opportunities for change?
7. What would be a good way to get all these stakeholders together to fix the problem?
8. Where is the leveraging point in this system? Where can we make a change that has a big effect? Support your answer.

Next Steps

- Find the leveraging points in the system. Where can we make a change that has a big effect?
- Explore multiple ideas for positive change.
- Decide on a group action and develop a plan to implement the change
- Identify any self-reinforcing or self-regulating feedback loops in the system and draw graphics of those dynamics.
- If exploring a social dynamic, develop a community resolution, commitment or set of rules that will create positive change.



Example of a food web.

Inspired by
Project LEAP: Learning about Ecology, Animals, and Plants, College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853 and
Sweeney, Linda Booth and Dennis Meadows (2010). The Web of Life. In The Systems Thinking Playbook. White River Junction, VT: Chelsea Green Publishing