ARTHROPOD FOOD WEB TEACHER GUIDE

Age Range: Grades 6-9

Background: Learning about food webs is exciting, and can be supplemented with this arthropod activity. This activity allows students to see the interconnectedness of many of the organisms they encounter when they are outside.

Related NC Standards:

8.L.3- Understand how organisms interact with and respond to the biotic and abiotic components of their environment

8.L.3.3- Explain how to flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide, and oxygen)

6.L.2- Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors of their environment

6.L.2.1- Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within food chains to food webs (terrestrial and aquatic) from producers to consumers to deocmposers

Materials Needed:

- Butcher paper
- Two different colors of printer paper
- Computer with printing capabilities
- Scissors
- Crayons
- Field guides (optional for learning about arthropods)
- Computers with internet access (optional for learning about arthropods)

Time Required: Approximately one hour (20 minutes for WANTED Posters and 40 minutes for the card sort)

Preparation:

- Print off 7 copies of the blank WANTED Poster
- Gather materials needed for students to fill out the posters
    - Crayons/markers
    - Field guides, our arthropod guide (find in the resources tab), etc.
- Print off 7 sets of the organism/action cards
- Gather materials needed for students to complete the card sort
    - Scissors (for cutting out the cards)
    - Markers (for drawing the arrows that connect the organisms)
    - Butcher paper (cut in ~2' x 3' rectangles)
    - Note: If cards are printed on heavier card stock, or are laminated, then they can easily be reused in future classes.

Day of Activity:

Wanted Posters

1. Start out by breaking students into 6 (or 7) groups. Allow students to come to the front of the room to grab their supplies for the WANTED Posters.

    Group Assignments

    Group 1: Spiders

    Group 2: Aphids

    Group 3: Caterpillars

    Group 4: Bees

    Group 5: Flies

    Group 6: Ants

    Group 7 (optional): Ladybird Beetles

2. Explain the process of looking for information about an arthropod. The main thing we are interested in is the diet of the arthropod, as this will best prepare the students for the next step of the activity. Look not only at what the arthropod eats, but also what eats the arthropod! If you choose to use computers during the search, it may be helpful to provide your students with a few useful links (these can be found at the end of this guide).
3. Explain the process of looking for information about an arthropod. The main thing we are interested in is the diet of the arthropod, as this will best prepare the students for the next step of the activity. Look not only at what the arthropod eats, but also what eats the arthropod! If you choose to use computers during the search, it may be helpful to provide your students with a few useful links (these can be found at the end of this guide).

4. Once the students have gathered information, allow them to fill out their WANTED posters. Remind them to put useful information on the poster, but useful doesn't mean it can't be funny!

   Example:

   Name: Alice the Aphid
   Wanted For: Sucking the sap out of poor innocent trees
   Last Victim: Sally the Sycamore

5. Once the posters are complete and you have checked over them for completeness, allow the students to do a brief presentation on their arthropod. Then, hang the posters on an empty wall in the classroom. This will allow the students to refer back to the information as they complete the next part of the activity.

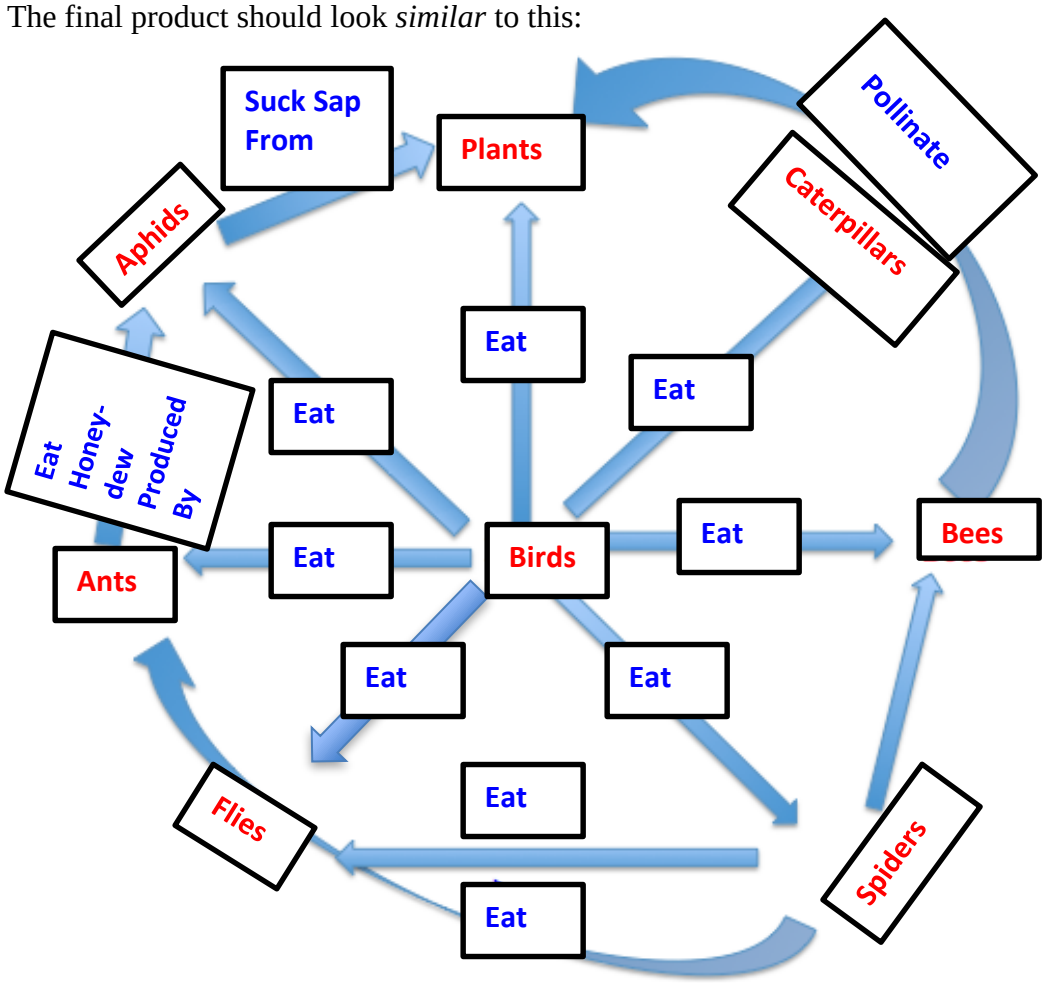
Arthropod Food Webs

1. Break the students up into new groups so that each new group ideally has students who learned about each of the different arthropod types.
2. Instruct the students to cut out the cards, keeping the organism cards separated from the action cards.
3. Next, tell students to place the butcher paper on their desk. (the butcher paper should probably be ~2'X4', but if your students' desks are not this big simply allow them to pull their desks together, thus creating a larger space).
4. Then, tell the students to place the ORGANISM cards on top of the butcher paper in any array they choose. It will be helpful, however, if the "bird" card is in the middle of the desk.
5. Lastly, instruct students on how to connect the organisms using the actions. The organism→ action→ organism should make a sentence. For example, "Bees Pollinate Plants." The students should draw arrows between each organism and lay the action on top of the arrow.

   Note: The direction of the arrows is very important, and should be taken into account!

   For example: "cat → eats → mouse," not "mouse → eats → cat." The verbs and organisms remain the same, but the direction of the arrow makes a big difference!

The final product should look *similar* to this:



Checklist of Connections:

Birds→(eat) spiders, (eat) flies, (eat) caterpillars, (eat) ants, (eat) aphids, (eat) birds
Spiders→(eat) flies, (eat) ants, (eat) aphids, (eat) caterpillars
Caterpillars→(eat the leaves of) plants
Bees→(pollinate) plants
Flies→(eat microbes from the surface of) plants
Flies→(pollinate) plants
Aphids→(suck juices from) plants
Ants→(eat the honeydew produced by) aphids

Note: The highlighted actions above are optional. If you would like to talk about them in your class then feel free! Some of your students may indicate these as possible connections and they are correct in saying so. Also, the drawing above does NOT contain all of the possible interactions. It rather just gives you an example of the final product.

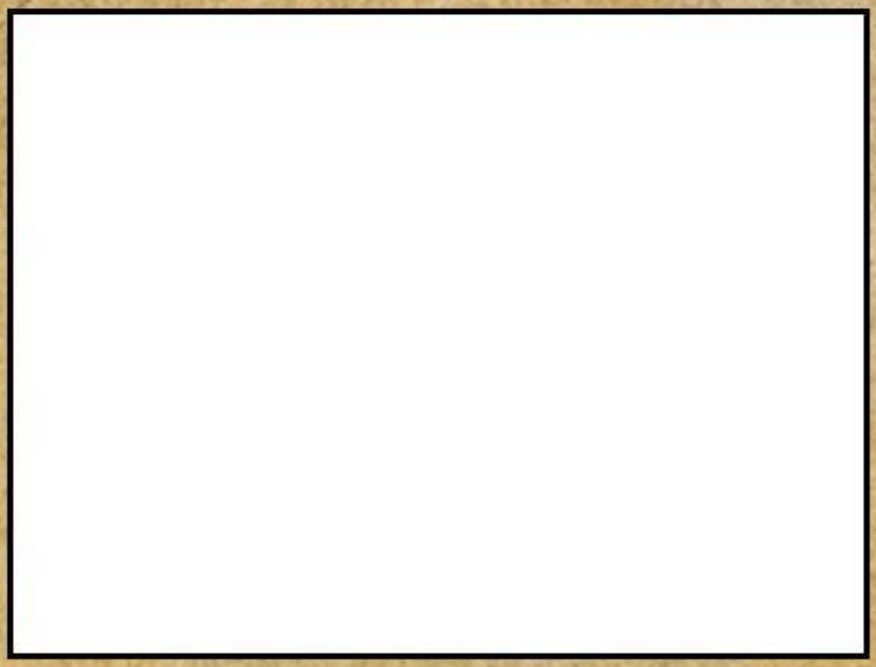
Discussion Questions:

1. How many organisms would be affected if spiders were removed from the food web? What if we removed plants instead?
2. What problems can you think of that might result from birds being removed from the food web? (Carrying capacity)
3. Does the food web continue on past birds?
4. How much energy is being transferred from one animal to the next as you move through the food web?

Useful Links:

Aphids	http://www.aphids.info (click on "About Aphids" at the top of the screen) https://www.youtube.com/watch?v=Dhi-SYxNPFw (short video on ant/aphid farming)
Bees	http://a-z-animals.com/animals/honey-bee/
Caterpillar	http://a-z-animals.com/animals/caterpillar/
Flies	http://a-z-animals.com/animals/fly/
Ants	http://a-z-animals.com/animals/ant/
Spiders	http://www.spiders.us/species/agelenopsis-spp/

WANTED



NAME: _____

WANTED FOR: _____

_____

LAST VICTIM: _____

EAT	EAT
EAT	EAT
EAT	EAT
EAT	EAT

EAT	EAT THE LEAVES OF
POLLINATE	SUCK JUICES FROM
EAT MICROBES FROM THE SURFACE OF	EAT HONEYDEW PRODUCED BY
POLLINATE	EAT THE LEAVES OF

PLANTS	BIRDS
BEES	APHIDS
CATERPILLARS	ANTS
FLIES	SPIDERS