



# Food Production Department

## Lesson 3 - A Naturalist's Buffet: Yummy and Yuck! (Grade 3-5)

### Essential Questions:

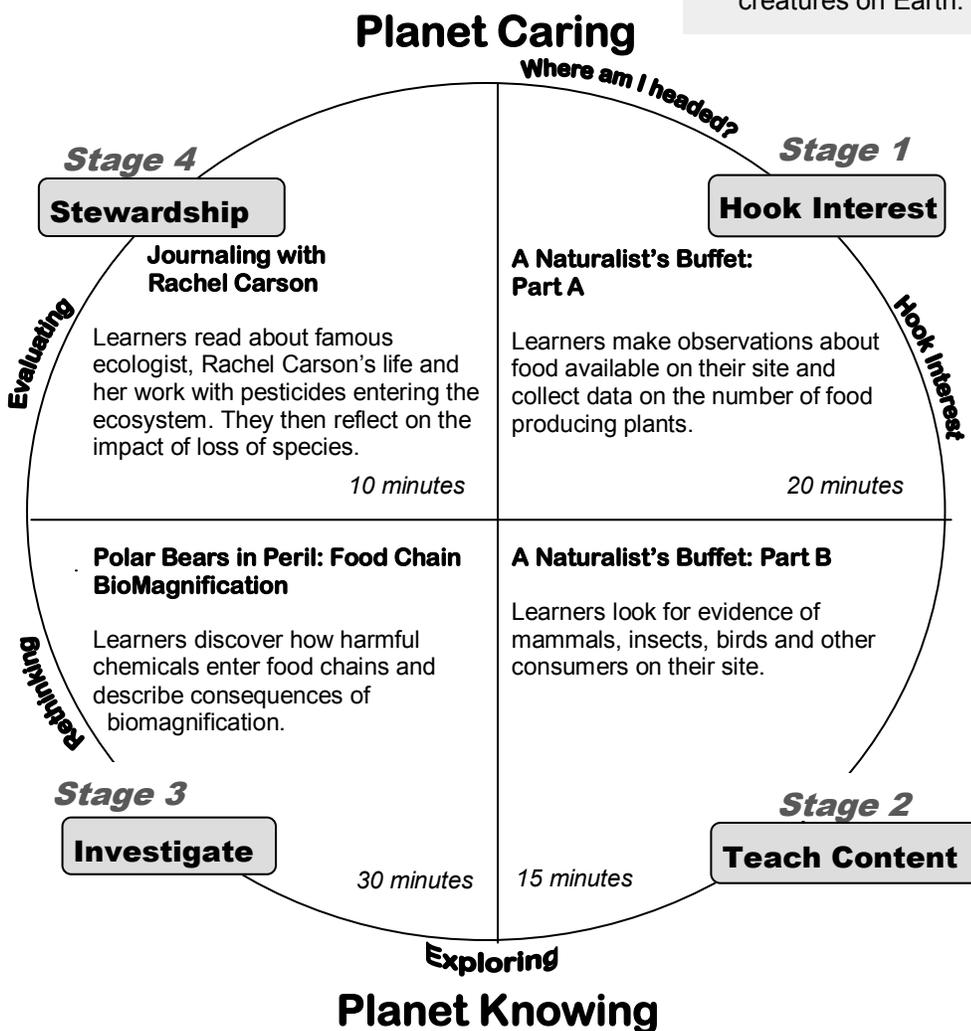
- What animals are eating on our site?*
- What wildlife does your club site support?*
- What is biomagnification?*
- How do pesticides biomagnify throughout the ecosystem?*

### At a Glance:

Food availability and food consumers are explored in 'A Naturalist's Buffet'. Learners role play consumers in a food chain to learn about biomagnification of harmful chemicals in ecosystem. A reflection activity that highlights the work of Rachel Carson, an advocate against the use of DDT, helps learners understand the importance of action to protect ecosystem health.

### Concepts:

- A major function of a healthy ecosystem is producing nutritious food for the animals that live there.
- The sun is the base of all food chains.
- Organisms have adapted and will "eat" a variety of foods within the ecosystem.
- Pesticides and other synthetic chemicals can be very dangerous to ecosystem health, particularly through biomagnification.
- Agricultural, political, and lifestyle changes are needed to ensure enough food for all creatures on Earth.



### Objectives

#### Learners ...

- 1) make general observations about relationships between producers, consumers, predators, prey, decomposers and humans on the club site.
- 2) quantify the types of food available for humans, fruit eaters, nectar feeders, and seed eaters.
- 3) collect data on the number of food producing plants, and the presence of wildlife on the club site.
- 4) define biomagnification.
- 5) describe consequences of pollutants entering food chains.
- 6) explore the life and work of Rachel Carson and her involvement in reducing pesticides in the environment.

## PROCEDURES IN BRIEF: Lesson 3—A Naturalist’s Buffet - Yummy and Yuck!

### Stage 1. Naturalist’s Buffet: Part A

#### Procedure:

1. Ask learners to think about the foods that are available on the club site. Explain that they will be studying the Food Department and monitoring the amount of food available on the site as well as the creatures that eat the food from year to year.
2. Divide learners into six teams. Distribute supplies to each group. Assign two groups to each Checkpoint.
3. At the Checkpoints, use the compass to determine north, south, east and west. Walk 5 paces north and create a 2 square meter plot at this location. Have students wrap a string around the flags to designate their 2 square meter plot. *See diagram.*
4. Groups will spend about 5 minutes searching their area for producers in the Food Department. These producers include grasses, flowers, fruits/seeds/nuts, fungi, or anything else that can be eaten. All clues should be left where they are. Make a tally (/) in the appropriate boxes on the data sheet for each different producer that is seen.
5. When collection time is up, learners will choose a place to sit inside of their plot. Allow 5 minutes to describe or sketch the items found.

#### Supplies

- Standards Checks Data Sheets
- Standards Checks Map
- Plant Identification Guide
- compass
- flags or flagging tape
- measuring tape

### Stage 2. Naturalist’s Buffet: Part B

#### Procedure:

1. Now that the learners have observed some producers on their site, they can look for signs of animals. Signs may include footprints, sounds, digging, hair, feathers, scat, chewed leaves and seeds, or actual animals.
2. Allow 5 minutes for observation within the plot area. Use the data sheet to record signs of animals.
3. When observation and recording time is up, flags and other supplies should be collected. Learners may share their findings and drawings if they choose to.

#### Supplies

- Standards Checks Data Sheets
- Standards Checks Map
- Bird Identification Guide
- Insect Identification Guide

#### Discussion:

Does the club site provide food for local wildlife?  
Did you see many animals? any signs of animals?  
What can be done to improve the amount of wildlife food produced on our site?

### Stage 3. Polar Bears in Peril: *Food Chain Biomagnification*

#### Procedure:

1. Define ‘bioaccumulation’ (when contaminants, often man-made chemicals, build up in the fatty tissue of organisms) & ‘biomagnification’ (when smaller organisms are eaten by larger predator and bioaccumulated toxins increase in higher trophic levels of the food chain/web).
2. Set up in the activity in an open area. Divide the learners into 3 groups – Arctic cod, Ringed seals, and Polar bears.
3. Scatter the ‘Plankton’ cards in a central area. Tell learners that plankton are microscopic aquatic plants and animals that filter water. When toxins are present, they are absorbed by plankton.
4. Give each ‘Arctic cod’ learner a bag. This will represent their stomach.
5. Tell the ‘cod’ to gather (eat) plankton and put in their bag (stomach). Once all the plankton have been ‘eaten’, have the ‘Cod’ group look at their plankton cards. Dots on the cards represent the level of toxins accumulated. Each ‘cod’ is to add up the number of dots, giving them a toxicity level. If their toxicity level is greater than 25, it is too much for their systems to handle and they die. Ask the living ‘cod’ to remember their toxicity level (keep ‘stomach’ bags).
6. Next, have the ‘cod’ that are still alive enter the play area. The ‘Seals’ will now hunt for their prey. ‘Seals’ may lightly tag the ‘cod’ to represent the catch. Once all of the ‘cod’ have been ‘eaten’, have the ‘seals’ assess their toxins accumulated. Add up the toxicity levels of the ‘cod’ caught. Note the levels for each ‘seal’.
7. Last, the ‘polar bear’ group will hunt for ‘seals’. They are to add up their biomagnified toxicity level. Compare these levels to those of the plankton, cod, and seals (much greater).
8. Discuss the impacts of bioaccumulation and biomagnification..

#### Supplies

- Biomagnification ‘Plankton’ cards
- small bags
- clipboard/paper
- pen/pencil

### Stage 4. Activism with Rachel Carson

#### Procedure:

1. Discuss Rachel Carson’s life and the impact she had on the environmental movement. Also focus on how DDT made its way through the food web – relating her work to the Food Department.
  - How did DDT pass through the food web to impact a range of species, including humans? How does this relate to the Food Department? Does this still happen with pesticides and other chemicals?
  - Do you think it made a difference that Carson was a woman scientist?
  - Would a man have gotten more respect? less respect?
  - What would have happened if she had been intimidated and had not stood up against the chemical companies and the government?
  - What would be the state of our ecosystems today if these dangerous chemicals were still used?
2. Have students reflect in their journal or on the handout about the discussion. What are some issues that they can stand up for today? What would they do if they were met with opposition? Use the following quote from Rachel Carson as a catalyst.

#### Supplies

- journal
- ‘Rachel Carson fact sheet’
- pencils/pen

“One way to open your eyes is to ask yourself, What if I had never seen this before? What if I knew I would never see it again?”

- Rachel Carson

Complete lesson write-ups are available in the GEN manuals.