Lesson Title: Where Does Our Food Come From?

Materials:

- Sheets of paper with images of particular foods
- Bags of feathers, one per group
- Cones (as used for sports)

Objective:
Students should learn about how energy is lost along a food chain. Students should be able to use this knowledge to assess the relative environmental impacts of plant-based foods and animal-based foods.

Overview:
To start the lesson, explain to students that you will be learning about the energy inputs into our food and what happens to that energy along a food chain. Then, explain activity one. In activity one, students will evaluate the resource inputs for various foods, including plant-based and animal-based foods. The teacher will guide discussion to talk about how those inputs might be used by plants and animals.

After activity one, students will be guided through activity two, which will model how energy is lost throughout the course of a food chain. Students will participate in a short relay race in their groups in which they attempt to pass off feathers, which represent energy. Teacher will lead students through discussion to assess how energy is lost on a food chain.

After activity two and the debriefing of the activity, have students work individually to draw a food chain with three different levels. Have them write a short paragraph or two on their drawing explaining how much energy we put into and get out of the foods at different levels of the food chain. Have the students write about which types of food they think are better or worse for the environment and why.

Activity 1: Food Chains and Energy

Have students count off to split them into groups of four. Hand out one slip of paper to each group with a picture of a food on it. Include plant-based foods, meats, and animal products. Choose the number of food types based on the size of your class. Such a list might include:

- Chicken
- Beef
- Spinach
- Avocado
- Black Beans
- Apples
- Mushrooms
- Oranges
- Whole Grain Bread
- Milk

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In their groups, instruct students to come up with a list of all of the inputs needed to produce those foods. Give students a couple of minutes to compile their lists. Ask groups to share their foods and the inputs they have come up with. Students should list water, fertilizer, land, sunlight, and feed (for animal products). Prompt students: did groups with animal products include sunlight and fertilizer in their lists? Why or why not?

Prompt students: what happens to all of the food and water that we give to animals? Students may say that it makes them grow, allows them to produce more milk and meat, or that they lose it as manure and urine. Teacher should record these answers on the board. Prompt students: do we get more energy from raising meat than we do from growing and eating plants?

Have students discuss this in their small groups. Teacher may call on groups for responses. Student answers may vary, particularly because meat is seen as a high-energy food product.

Activity 2: Food Chain Relay

Bring students into an open space such as a gym or hallway. In their groups from activity one, have the students line up for a relay race. For the race, the first student in each group must hold a bundle of feathers. This student must run to the end of the course, designated by a cone, then run back and pass off the feathers to the next teammate. This continues until everyone in the team has gone. Before beginning the race, tell the students that the feathers represent the energy that animals get from food.

Upon finishing the activity, return to the classroom space. Ask students: what happened to most of the energy that you started with? Follow with the prompt: when did you lose the most energy?

Students should respond that they lost the most energy when transferring feathers from one partner to the next.

Explain that this models how energy is lost in animals, too. When they eat food, some energy is lost right at the transfer when the animal is breaking down the food because it takes energy to break food into its useful components. Then, point out that not all of the food can be digested, so some of it is lost to manure. Then ask students: are there any detectable sign to energy loss other than manure?

Activity 3: “True Cost of Food” video

If you have time, show the video “The True Cost of Food” from the vimeo website. (http://vimeo.com/37835035) and discus with students

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