STUDENT GUIDE
EXPLAIN LESSON 18

Food and Agriculture Center for Science Education

Part 1: Our Motivation

Record what we were trying to explain about the module phenomenon.

> I think we are starting to see how biodiversity is impacted by dairy production. We can now show in our models all the different impacts that it can have and how that affects humans.
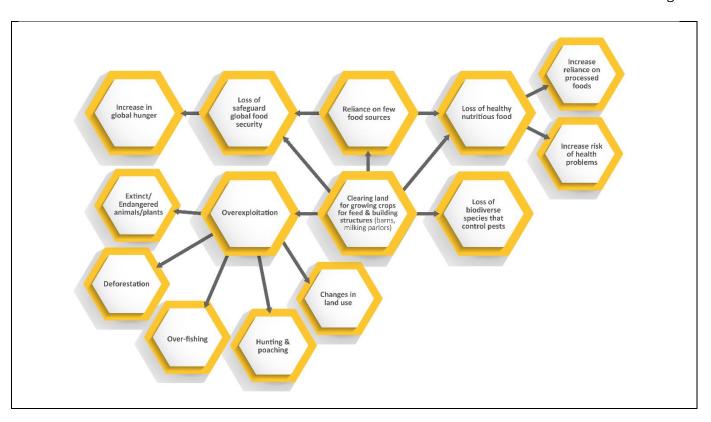
Part 2: Revising Initial Models

Review your initial model that explains our lesson question, "How does the dairy system impact plants and animals and why does it matter?"

Using the space provided, update your model and be sure to:

- Place "clearing land for growing crops for feed & building structures (barns, milking parlors)" in the middle of the model.
- Create arrows and new boxes to show the impacts you believe the system has on biodiversity.
- Show why the system has impacts on biodiversity, including through overpopulation, overexploitation, habitat destruction, and pollution.
- Show how the changes in biodiversity caused by the dairy system impact humans.

Be ready to share your model with the class. After sharing your model, make revisions based on the feedback you have received from your peers.

Explain how your model shows how the losses of biodiversity due to construction of the dairy system can impact humans.

The construction of the dairy system was intended to produce dairy products for human consumption, but it is having unintended consequences in decreasing biodiversity. Biodiversity loss, across the board, is bad. It impacts much of our lives as humans. When one part of biodiversity is impacted it creates a domino effect of negative impacts that are bad for animals, plants, and people. Biodiversity is impacted through habitat destruction, overexploitation, pollution, and overpopulation. When habitats are destroyed, animals have no place to live, so they may die. When lands are cleared for monoculture agriculture, many kinds of plants are killed and no longer have land to regrow. The construction of monoculture feed for the dairy system also creates significant pollution in the form of manure runoff, fertilizer runoff, and pesticides, which all can also have negative effects on plants and animals. Finally, the overpopulation of humans means that dairy manufacturers want to expand their farms to produce more dairy, but this will continue to have more negative impacts on the nearby plants and animals.

All these actions risk major problems for us as humans. When biodiversity is decreased, ecosystems lose their function. These ecosystems provide services to humans, such as pollination, pest control for crops, and soil fertility. When these factors are disturbed, it can lead to a loss off agricultural crops, which leads to an increase in global hunger, increase in pests/diseases, extinction of animals/plant species, and increase risk of health problems. Everything is connected, so when one piece is impacted, so are all the rest.

??? Part 3: Asking New Questions

Record new questions you have that might help you:

- Find additional information about the impact of dairy on plants and animals.
- "Fill in a gap" in your model.
- Settle an area of disagreement that we've identified in our models.

- What is being done to stop these negative impacts?
- How can we improve biodiversity in dairy farms?
- How can we prevent the loss of biodiversity?
- So far, what has been done in finding a solution for these issues?
- Who is responsible for making the changes to the system?
- Where are these impacts happening around the world?