Activity: Build Your Own Ecosystem Trophic Cascade

This will be a hands-on, interactive lesson exploring how wolves changed Yellowstone and reinforcing the concept of ecological connections. Please feel free to adapt it to your students' needs.

Learning Goals

Students will:

- Understand what a **trophic cascade** is
- See how one species can affect an entire ecosystem
- Explore cause-and-effect relationships
- Work collaboratively to model ecological change

Materials

- Index cards or sticky notes
- Markers
- String/yarn or dry erase markers
- Tape
- A large open wall or whiteboard
- Optional: printed pictures of animals and plants (wolves, elk, beavers, rivers, trees, etc.)

Activity Overview

Students create a giant, interactive “ecosystem web” that shows how wolves influenced Yellowstone’s plants, animals, and rivers. Then they simulate what happens when wolves disappear — and what happens when they return.

Part 1: Build the Ecosystem Web

1. Assign Roles

Divide students into groups. Each group gets one ecosystem component, such as:

- Wolves
- Elk
- Willow trees
- Aspen trees
- Ground vegetation
- Beavers
- Riverbanks
- Birds
- Small mammals
- Rivers

Note: You do not need to use all of these options. Using 4-6 will work well.

Each group writes their species or element on a card and tapes it to the wall or whiteboard.

2. Connect the Web

Give students yarn or a dry erase marker and ask them to connect their card to any other card their species affects.

Examples:

- Wolves → Elk
- Elk → Willow trees
- Beavers → Rivers

Students tape the yarn between cards to show these relationships.

When connecting the cards, encourage the students to think about how the connection impacts the ecosystem. Does it help, harm, or change a part of the ecosystem?

Once finished, your students will observe the web of connections.

Part 2: Remove the Wolves

Next, tell students: **“Imagine wolves disappear from Yellowstone.”**

Then ask each group to explain what happens to their species.

Guide them with questions like:

- Does your population grow or shrink?
- Does your food source change?
- Does your habitat change?
- Does another species become a problem?

As each group explains, students adjust the web:

- Add/remove arrows or yarn
- Add notes like “population increases” or “trees decline”

This helps them visualize the ecosystem unraveling.

Part 3: Bring the Wolves Back

Now say: **“Wolves return to Yellowstone. What happens next?”**

Students reverse the process:

- Wolves reduce elk
- Plants grow back
- Beavers return
- Rivers stabilize
- Birds and small mammals increase

Have students adjust the web again to show the recovery.

This part allows students to see how one species affects everything else.

Part 4: Reflection Questions

Have students answer individually as homework or discuss in groups:

1. Which species was directly affected when wolves were removed?

2. Which changes surprised you?

3. Why did rivers change even though wolves never touched the water?

4. What does this activity teach us about protecting ecosystems?

5. Can you think of another example of a species affecting many others?

    - This can also be adapted into a standalone homework assignment. Students research another animal capable of triggering a trophic cascade, writing a brief summary explaining how it does so.

Simple Example Image: