

1.9 Environmental Impact Statements—Written Assessment










Action Synopsis

Students write predictions of how a proposed change to their study site would affect the organisms that live there.

One Session

40–60 minutes

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| 1. Talk about what causes changes in the environment. |  | examining prior ideas |
| 2. Describe Environmental Impact Statements. |  | introducing new information |
| 3. Present the challenge of assessing the impact of a study site alteration. |  | posing a challenge |
| 4. Discuss criteria for high quality work. |  | setting standards |
| 5. Share ideas in pairs, then write Environmental Impact Statements for the landowner. |  | applying knowledge |
| 6. Share and discuss the written statements. |  | reflecting |
| 7. Evaluate work and select samples for a portfolio. |  | assessing |

Desired Outcomes

By the end of this assessment activity, students should:

- ✓ Be able to predict how changes in a landscape could ripple through a food web.
- ✓ Understand why it's important for people to consider the food web of a piece of land before they alter it.

What You'll Need



For the class:

- several copies of the *Who Eats What* guide (pages 355–382)
- other resource books (see "Resource List," pages 51–55)

For each student:

- copy of "Challenge Sheet" (page 161)
- copy of "Scoring Sheet" (page 162)
- copy of "Portfolio Cover Sheet" (page 39)

Vocabulary



ENVIRONMENTAL IMPACT STATEMENT - A scientific report predicting how proposed changes to a site will affect its ecosystem.

Getting Ready

- ◆ Instead of using the "Challenge Sheet" and "Scoring Sheet" provided, consider writing your own challenge statement that is tailored to your study site, and devising your own scoring criteria in collaboration with your students. Some possible site alterations for students to evaluate are: paving a pathway or rerouting a road through the site; fencing around the site to keep out deer or people; mowing; cutting down trees; building a playground; spraying for mosquitoes; erecting a tall building; or introducing a new plant or animal species.

Action Narrative

One of the good things about knowing how different animals use plants, other animals, and the non-living environment to survive, is being able to predict how they

will be affected if the place where they live is changed. What are some of the things that cause an environment to change?

Students might mention natural disasters such as floods, earthquakes, wind, and fires, as well as changes caused by humans such as cutting down trees, building roads and structures, and paving parking lots.

Has anyone heard of ENVIRONMENTAL IMPACT STATEMENTS?

After students have offered their ideas, share with them that these are reports that scientists do when someone wants to change a large or special piece of land. Their job is to survey the living and non-living features of the site, and predict how the proposed changes will affect these things. Emphasize that the purpose of these reports is not to stop all development, but to help people shape their plans so that damage to the environment is minimized.

You might want to point out that people place different values on different things in nature. For instance, if a rare or endangered species is on a site, a development project might be halted. On the other hand, if habitats for common organisms such as sow bugs, earthworms, squirrels, and "weeds" will disappear, people won't mind as much because plenty of these things live in other locations.

Today you are going to write an Environmental Impact Statement about the food web of our study site. Here is the situation you'll write about.

Give a copy of the "Challenge Sheet" to each student and discuss it. Make sure students understand that they should try to trace how the proposed action could ripple through the food web of their site. Encourage them to refer to the food webs they've already made of the site for ideas.

How should we evaluate your work?

Have students generate standards for their work. Either formalize their suggestions into an assessment sheet, or give them a copy of the "Scoring Sheet," if it is an appropriate summary of what you and they feel is important.

You can start out in pairs to share ideas, then everyone will write his or her own Environmental Impact Statement in the form of a letter to the landowner.

Let students brainstorm ideas in pairs for about ten minutes and then write their own letters. This allows both for idea interchange to jog and expand thinking, and for individual accountability. As pairs talk, listen to make sure that they are using the assignment as an opportunity to demonstrate their understanding of the concepts they've learned over the past several weeks.

Students will need 20–30 minutes to write their letters. When they're finished, ask volunteers to read their letters aloud.

	Dear Smith Street Vacant Lot Owner,
	Our class has been studying your lot on Smith Street and we've discovered that it is not vacant! There are lots of amazing things living there, such as caterpillars, grubs, earthworms, sow bugs, 2 kinds of trees, and even a woodpecker.
	This is why we have a problem with Clean Up Crew 2's plan for your lot. Lots of the animals depend on the dead leaves and branches, and even some of the trash that's there, too. Like if the Crew cuts the dead branches, the grubs won't be there anymore, and then the woodpecker that eats the grubs won't come around.



Conclude with questions such as:

How certain do you feel that the changes in the food web you described would really occur after the Clean Up Crew Two did its work?

There is always an element of uncertainty in an Environmental Impact Statement. The environmental specialist writing the statement must provide as much support for the claims as possible, for instance by describing the outcome of a similar case.

How important is it if the organisms you mentioned die or leave the site?

Some students might make a case for why the benefits of the Clean Up Crew Two's work (e.g., a tidier landscape) outweigh the possible costs. Placing values on the decline or disappearance of organisms from a site is a key factor in deciding what action to take once an Environmental Impact Statement is written.

What is the best way to decide what to do when human preferences conflict with what's best for other parts of nature?

This question will help students think about the extent to which they feel that parts of nature that don't have an immediate benefit to people do or do not have rights.

Ongoing Assessment

Student Reflections

Have students evaluate their own work by completing a "Scoring Sheet" for the Environmental Impact Statement they wrote. This is also a good time to have them select work samples for a portfolio, and complete a "Portfolio Cover Sheet" (page 39). Review the purpose and structure of a portfolio, and set a due date.

Teacher Reflections

As you evaluate students' work, look for descriptions of food web impact that begin with the dead matter that decomposers eat, and then expand to include animals that eat decomposers. For example, if a dead branch is removed, the grubs feeding on it might die, and the woodpeckers who eat grubs might go somewhere else to find food. Students might also trace food web impacts that begin when animals that use dead plants for shelter, egg laying, or as hiding places for food, decline. The "Scoring Sheet" gives the highest points for true food webs (e.g., tracing how each organism eats and is eaten by more than one thing), rather than for a series of independent food chains.

Since students' food web studies have not emphasized nutrient cycling, don't expect them to include the effect that removing dead plants from the site could have on soil fertility and the health of living plants. It's a bonus if someone does mention this, since it will broaden the class's understanding of the impact of removing dead organic matter from a site, and set the stage for investigations in Modules 2 and 3.

NAME _____ DATE _____

ENVIRONMENTAL IMPACT STATEMENTS

A new business called the Clean Up Crew Two has made a special offer to the owner of your study site. After its parent company, the Clean Up Crew, picks up any trash on the site, Clean Up Crew Two will clear away all the dead leaves, branches, logs, and all other dead material on the ground. Clean Up Crew Two will also remove dead branches from living plants, and dead plants that are still standing.

They say that their work will make the site a neater, cleaner, and safer place for people to enjoy. Their first visit will be free, then the landowner will pay a discount price for a cleanup every six months.

YOUR CHALLENGE:

Write an Environmental Impact Statement in the form of a letter to the study site landowners. Say what you predict would happen to the things that live on the site if they accept the offer. Mention organisms that could lose their food, die outright, or increase. Give examples of how each thing affected could cause other changes in the food web.

Recommend whether the landowner should accept the offer, and explain why or why not.

RESOURCES:

You can use your food chains, food webs, and resource books to help you figure out how Clean Up Crew Two's work could affect your study site.

GOOD LUCK!

NAME(S) _____ DATE _____

ENVIRONMENTAL IMPACT STATEMENTS

OBJECTIVES	POINTS				SCORE
	3 High Quality	2 Meets Objectives	1 Falls Short	0 Not Done	
CONTENT					
1. Mentions organisms that would die or lose their food source.	_____	_____	_____	_____	= _____
2. Mentions organisms that could increase.	_____	_____	_____	_____	= _____
3. Uses food chain vocabulary.	_____	_____	_____	_____	= _____
SCOPE					
4. Describes how one change could affect more than one food chain in a food web.	_____	_____	_____	_____	_____ x 2 = _____
5. Correctly traces a food chain through at least two steps.	_____	_____	_____	_____	= _____
COMMUNICATION					
6. Overall, presents a clear, detailed, and convincing argument for why to accept or not accept Clean Up Crew Two's offer.	_____	_____	_____	_____	= _____
COMMENTS:				FINAL SCORE: _____	
				Total Possible Score: 21 Overall Achievement: 18-21 High 14-17 Sound 8-13 Limited 0-7 Inadequate	