Ecosystems
Student Self-Assessment

Name: _____

Date: _____

1. What important things have you learned from doing the activities in the Ecosystems unit?

2. How well do you think you and your partner(s) worked together? Give some examples.

3. Write down activities in the unit that you particularly enjoyed. Explain why you liked them.

4. Were there any activities in the unit you did not understand or that confused you? Explain your answer.

5. Take a look at your record sheets and your science notebooks. Describe how well you think you recorded your observations and ideas.

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6. Think about the work you did in this unit. What do you think you did very well?

   What area of your work do you think you can improve on?

7. How do you feel about science? Circle the words that apply to you.
   a. Interested
   b. Relaxed
   c. Nervous
   d. Excited
   e. Bored
   f. Confused
   g. Successful
   h. Happy
   i. Write down one word of your own _____

Diapers: An Environmental Problem

Let's face it: baby bottoms need to be covered. But what kind of diaper is best for the environment: cloth or disposable? Different people have different points of view on the subject.

As you read the selection, think about these questions:

- Which point of view do you agree with? In other words, which kind of diaper do you think is less harmful to the environment and why?
- If you were a parent, what type of diaper would you use? If you were this parent, why might it be difficult for you to switch to disposable diapers?
- If you were a day-care worker, what type of diaper would you use? If you were this day-care worker, why would it be difficult for you to switch to cloth diapers?

From One Parent's Point of View

> *We use cloth diapers for our baby. She has very sensitive skin, and cloth is softer and less irritating. I can adjust the cloth diaper to fit her exactly, too. Plus, I can rinse them out and wash them at my convenience instead of storing up smelly bagloads in the apartment until trash day.*

Cloth diapers are reusable. Even after the baby no longer needs them, they make great rags and polishing cloths.

Of course, cloth diapers need regular washing in hot soapy water. Heating the water means having to burn fossil fuels. So cloth diapers contribute to air pollution.

Most cloth diapers are made of cotton because it is soft and absorbent. But cotton is a crop that is hard on the land. It requires large quantities of fertilizer and heavy use of pesticides.

From One Day-Care Worker's Point of View

> *I change about 75 diapers a day here. The disposable diapers are faster and easier to use, more convenient to get rid of, more sanitary because you are using a fresh diaper on each child, and safer (no pins) than cloth diapers.*

Each year, Americans throw away about 18 billion disposable diapers, which, along with their contents (human waste), end up in landfills. In fact, disposable diapers make up about 2 percent of the nation's garbage.

Disposable diapers are made from plastic (petroleum) and wood pulp (trees). This uses up our natural resources. But when the cotton for cloth diapers is grown, harmful pesticides are sometimes used. It takes only half as much energy to manufacture a cloth diaper and only about one-quarter as much water. But, a disposable diaper creates half as much air pollution when manufactured and about one-seventh the water pollution.

Pros and Cons

Sometimes it is hard to know exactly what is best for the environment. After you have read the selections above, make your choice. Then answer these questions:

- Which kind of diaper do you think is less harmful to the environment? Why?
- Why might a person who held a different point of view from yours find it difficult to choose as you did?

An Environmental Decision: Oil Fields or a Nature Refuge?

In the far northeastern reaches of Alaska lies the vast Arctic National Wildlife Refuge. It covers 19 million acres of rugged, beautiful land. And it is home to 180,000 caribou, 500 musk ox, and uncounted numbers of Dall sheep, birds, wolf packs, and grizzly bears. It may also hold the largest oil field in North America.

As you read the selection, think about these questions:

- If you were a member of the Gwich'in Indian Nation, how would you feel about oil drilling in the refuge? Why might you be against oil drilling?
- If you were an Inupiat Indian, how would you feel about oil drilling in the refuge? Why might you be for oil drilling?
- If you were an environmentalist, how would you feel about oil drilling in the refuge? If you were this environmentalist, why would you be against oil drilling in the refuge? What other solutions to the energy problem would you suggest?
- If you were a representative of a major oil company, how would you feel about oil drilling in the refuge? If you were this representative, why would you be for oil drilling? What other solutions and trade-offs would you offer?

The Inupiat Versus the Gwich'in Point of View

Two very different groups of American Indians live in the northeastern reaches of Alaska: the Inupiat and the Gwich'in. The Inupiat are whale hunters. They do not depend on the animals in the refuge for any of their needs. The Inupiat own oil rights to the land. They already receive millions of dollars in royalties from oil drilling companies, and they would receive even more if new wells opened up. This cash has greatly improved how they live. They enjoy off-road vehicles, satellite dishes, new housing, new schools, new roads, and firefighting equipment.

The Gwich'in Indians do not own any oil rights to the land. They would make no profit from oil drilling. They depend on the caribou as their main source of food. And they fear that the roads and the drilling activities would seriously affect the caribou herd.

The Environmentalist Versus the Oil Company Point of View

> *Should we fight wars over oil, or should we develop our own oil fields? Why should all that oil just sit there under the refuge? We are able to save money by drilling on our own land instead of buying oil from other countries. Then we can pass the savings on to the customer.*
>
> —A representative of a major oil company

> *Even if they did hit a huge supply under the Arctic Refuge, it still won't be enough. The U.S. will still have to import up to half of its oil. The answer is that we simply have to make more efficient use of our fuel, and cut back on the amount we use. We should not sacrifice our only Arctic sanctuary for oil.*
>
> —An environmentalist

An exploratory oil well was drilled in the refuge at a cost of $40 million. The oil company will not tell what it discovered. It may be nothing. Or it may be the biggest oil field in North America, able to deliver up to 9 billion barrels of oil.

What if this well turns out to be the enormous pool of oil that the companies hint it is? It would keep oil flowing through the Trans-Alaskan pipeline for another 10 to 20 years. Both the oil companies and the state of Alaska would make a huge profit.

Ecologists see this as a very fragile environment. They say that we cannot predict what effects humans will have on the wildlife here. The oil company wants to build 100 miles of pipeline, 120 miles of main roads, 160 miles of side roads, two airfields, and 60 drilling pads. Much of this building would be right in the area where the caribou come to feed and give birth to their calves.

The fragile land could be damaged by digging out gravel pits to build roads, by running heavy machinery over the grasslands, and by oil spills. Human activity might drive off the wolves and bears now roaming the area. This would upset the "natural balance" between these predators and their prey.

Pros and Cons

As you can see, environmental problems are often very complex, and one problem may have many different sides. In this case the U.S. Congress must decide whether to allow oil companies to drill in the Arctic National Wildlife Refuge.

What do you think?

- Do we need the oil badly enough to disturb our only Arctic preserve?
- Are there other areas in which we can drill that will have less effect on the environment?

Give as many reasons as you can to back up your argument.

Blackline Master

Ecosystems: Observations of Student Performance

STUDENT'S NAME:

Concepts	**Observations**
• An ecosystem is a community of organisms and its interaction with its environment. • Organisms can be categorized by the functions they serve in an ecosystem: producers, consumers, or decomposers. • Organisms in an ecosystem have dependent and interdependent relationships, which can be illustrated by food webs. • Factors that affect growth and reproduction of organisms in an ecosystem include light, water, temperature, and soil. • Natural and human-made events can "disturb" an ecosystem. • A pollutant is anything that can harm living organisms when too much of it is released into an ecosystem. Pollution is the condition that results when pollutants interact with the environment. • Pollutants can affect the stability of an ecosystem; solutions can help minimize or alleviate the effects of pollutants. • Model ecosystems can be used to learn more about the complex relationships that exist on earth.	
Skills	
• Using a hand lens, pH paper, measuring devices, and other testing equipment appropriately. • Conducting, recording, and organizing daily observations. • Planning, implementing, and analyzing experiments and drawing conclusions from the results. • Making and testing predictions. • Identifying ecosystems as stable or disturbed and recognizing the causes of a disturbed ecosystem as natural or human-made. • Reading for more information about ecosystems and pollution. • Communicating information through writing, drawing, and discussion. • Applying previously learned information to analyze a problem and suggest solutions.	