

Seas, Trees, and Economies

Lesson 5: Eggs-ternal Costs

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Standards and Benchmarks (see page 5.7)

Lesson Description

Students participate in an egg hunt. Through the activity, students recognize that some actions people take have external costs; that is, the actions impose costs on others. Students learn that property rights have a role in reducing external costs.

Grade Level

6-8

Economic Concepts

External costs (externalities or spillover costs)

Property rights (ownership)

Objectives

Students will be able to

- define external costs (externalities) and property rights,
 - give examples of external costs, and
 - explain the role of property rights in reducing external costs.
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Compelling Question

How can property rights reduce external costs?

Time Required

45-60 minutes

Materials

- A copy of Handout 5-1 for each student
- At least one plastic egg for each student, plus a few extras
- Pennies—twice the number of plastic eggs
- One nickel for each student
- Smelly food, such as a can/packet of tuna
- Resealable plastic bag large enough to hold the can/packet of tuna
- An orange

Preparation

Before class, hide plastic eggs throughout the classroom.

Procedure

1. Tell the class you've hidden plastic eggs throughout the classroom so that students can have an egg hunt. There will be two rounds in this egg hunt. The eggs will not be replenished between rounds. In the first round, you will pay two pennies for every egg that is found. Each time a student finds an egg, he or she must bring it to you. You will give the student two pennies and then the student may return to hunt additional eggs. Students may not have more than one egg in their hands at a time. At the end of 10 minutes, all students must return to their seats.
2. Explain that after students return to their seats, there will be a second round. The rules for the second round are the same as those in the first, except you will pay a nickel for each egg found. Students may participate in both rounds, just one of the rounds, or neither round—they choose. Students are not allowed to find an egg in the first round and then choose to turn it in during the second round. Eggs must be turned in as they are found.
3. Begin the first round, paying each student two pennies as an egg is turned in. Some students may plan to wait until the second round to receive the higher reward. However, when they realize that other students aren't waiting, they will probably join in. If the eggs are not hidden very well, all should be found during the first round. Once all eggs are found (or the 10 minutes are up), stop the first round.
4. Acting surprised, ask the students why they didn't wait until the second round to find eggs since you were willing to pay more in the second round. (*Students may reply that everyone else was finding eggs and that they were concerned there wouldn't be any left for the second round.*)

5. Point out that students are correct. As each person joined the first round, fewer and fewer eggs were likely to be left for the second round. This is called an external cost. **External costs** happen when one person does something to benefit him- or herself but in doing so unintentionally makes another person worse off. In this case, the actions of the other egg hunters made it hard for anyone to wait to receive a nickel in the second round. Every egg found in the first round cost each student a nickel (an extra 3 pennies) because that is how much more money the students could have had if everyone had waited to hunt in the second round. Discuss the following:
 - Did you notice any other external costs (actions that other people took that made you worse off) during this activity? *(Answers may include the following: Someone ran into me, shoved me, or pushed me. Other hunters got in my way, which made it difficult for me to hunt eggs. The teacher and other classrooms in the area had to put up with the noise and commotion created by the hunters. The room is more disorderly than before the hunt because desks and other objects have been moved.)*
 - Can you think of external costs that occur in school, in your community, or in your home? *(Answers may include the following: Your sibling messes up the bathroom and you must help clean it up. The students in front of you are talking during class, and you can't hear what the teacher is saying. Some students talk in class, and the entire class must miss recess as a result. People throw their trash on the sidewalks and streets, and other people have to see and smell the mess and clean up the trash.)*
6. Conduct the second round of the egg hunt if there are eggs still hidden after the first round.
7. After the egg hunt is completed, tell students you are going to demonstrate a second way in which you can collect eggs from them. Give each student one egg. Explain that the student owns the egg and may do what he or she wishes with the egg.
8. Ask students to consider the same options that were available with the egg hunt: They could sell the egg right now for two pennies or wait 10 minutes and sell the egg to you for a nickel. Discuss the following:
 - How many would sell your egg right now? *(Only a few, if any, should raise their hands.)*
 - How many would wait 10 minutes? *(Most of the students should raise their hands.)*
 - Why are you willing to wait now, but you weren't willing to wait for the second round of the egg hunt? *(The egg is mine. When I wait 10 minutes, I am guaranteed a nickel. If I had waited for the second round of the egg hunt, I may not have found an egg.)*
 - If the person in the seat next to you sells his or her egg right now, does that affect your ability to wait and sell your egg? *(No, if others sell their eggs early, it doesn't affect those who wish to wait.)*

9. Ask students what the difference is between your second method of collecting eggs from them and the egg-hunt method of collecting eggs from them. (*In the second method, the students own their eggs and may decide what to do with their eggs.*)
10. Explain that when you gave each student an egg, you told them they each owned the egg and could decide what to do with it. This means the students had property rights. Define **property rights** as the legal ownership of something with economic value.
11. Remind students that one student's decision to sell his or her egg didn't affect other students' ability to sell their eggs, because of property rights. Also, no one was running around trying to find eggs and sell them. As a result, there was less noise and less commotion. Students' property rights (ownership of eggs) reduced the external costs of collecting eggs. When property rights exist, external costs can be reduced.
12. Open the can/packet of tuna and allow it to sit on your desk for a while. Ask the students if they enjoy the smell of the tuna. Point out that no one owns the air. As a result, someone can use it in a way that might make others worse off. For example, people can produce a mixture that smells and other people have to put up with the smell—as you did with the tuna. Place the tuna in the plastic bag and seal it shut and then continue the discussion.
13. Peel the orange and throw the peel on the floor in the front of the classroom. Discuss the following:
 - Do you mind the smell of the orange in the air as you did the tuna? (*Answers will vary.*)
 - Is there anything else that bothers you about me having an orange as a snack? (*The peel on the floor*)
14. Point out that often people dump things on others' properties or fail to clean up after using picnic tables or land at a park. This also creates an external cost, just as having the orange peel on the classroom floor does. Ask students for other examples of external costs. (*Answers may include pollution in general: smoke from a factory; smoke from a cigarette; exhaust from a car, truck, or bus; noise from a construction site; or dog waste on the sidewalk.*)
15. Explain that external costs usually occur because there are no property rights or there are no rules about how something should be used. Remind students that when they owned their eggs, fewer external costs occurred. In the case of the tuna, no one owns the air and there were no rules about polluting the classroom air. In the case of the orange, there were no rules about polluting the classroom floor.
16. Explain that sometimes it is difficult to decide who owns a resource. For example, who owns the air, rivers, an ocean, or animals in an ocean? Ask the students who owns the classroom

environment. (Answers may vary. Students may say the teacher, the principal, or the students in the class.)

17. Point out that when people can't decide who owns a resource, they may ask government to make rules about how a resource is used. These rules are made to reduce the external costs that some people pay. (NOTE: Government action can also affect private property rights and other individual rights.)
18. Give students the following example: In the past, people could smoke cigarettes in restaurants; other people who didn't smoke had to breathe air with cigarette smoke in it. This is an example of an external cost. In many places, governments made rules to keep people from smoking in restaurants. (NOTE: These rules affect the rights of the business owners to determine what happens in their restaurants, and they affect the personal rights of smokers.)

Closure

19. Review the main points of the lesson with the following questions:
 - What is an external cost? (*When one person does something to benefit him- or herself but in doing so unintentionally makes another person worse off*)
 - What are property rights? (*Legal ownership of something of economic value*)
 - How can property rights reduce external costs? (*When people own the rights to something, they are able to decide how to use it; the actions of others don't affect their use of the item.*)
 - What happens when people can't determine ownership of something, such as the air, ocean, and so on? (*They rely on governments to decide how the resources will be used.*)

Assessment

20. Distribute a copy of *Handout 5-1: Assessment* to each student. Read the directions with the students and instruct them to complete the work. Use the answers below to review their work.
 1. *Air pollution and road congestion: Rules that cause people to drive less would reduce external costs.*
 2. *Air pollution and risk of wild fire: A law that prevents people from burning leaves, trash, and other waste in their yards would reduce external costs.*
 3. *Water pollution: A law preventing people from or fining people for pouring chemicals and other waste in the river would reduce external costs.*
 4. *Noise pollution: The owner of the hotel has the right to ask the guest to stop making noise. If the guest refuses to stop, the owner can tell the guest to leave.*

Standards and Benchmarks

Voluntary National Content Standards in Economics

Standard 10: Institutions

- **Benchmark: Grade 12**

1. Property rights, contract enforcement, standards for weights and measures, and liability rules affect incentives for people to produce and exchange goods and services.

Standard 17: Role of Government and Market Failure

- **Benchmarks: Grade 12**

1. Markets do not allocate resources efficiently if: (1) property rights are not clearly defined or enforced; (2) externalities (spillover effects) affecting large numbers of people are associated with the production or consumption of a product; or (3) markets are not competitive.
2. An important role for government in an economy is to define, establish, and enforce property rights. A property right to a good or service includes the right to exclude others from using the good or service and the right to transfer the ownership or use of the resource to others.

