

## Why Price Pollution? A Classroom Experiment – Instructions

David Lewis, Oregon State University ([lewisda@oregonstate.edu](mailto:lewisda@oregonstate.edu)), 10/7/17

**Objective:** This interactive game teaches students the related economics problems of externalities, market failure, and pollution pricing. This game can work in a high school economics course in which students have been exposed to basic supply-and-demand models.

### How to play:

- Break up the class into multiple teams. I often use 15 teams on campus.
- Each team receives four cards, two black cards and two blue cards. I typically distinguish teams with a number written on the cards, e.g. team 1 gets cards that all have the number 1.
- 5 rounds.
- During each round, groups have to determine which cards to give up (to play). The instructor collects the two cards from each group and scoring works as follows.
  - Each group begins with 200 points.
  - Each blue card you retain costs you -2 points.
  - Each black card you retain costs you 0 points.
  - For every blue card the instructor collects, each group must take off 1 point from their score.

**Typical outcome:** Most teams give up blue cards rather than retain them. For any one card, they take off 1 point if they give up the blue card, but take off 2 points if they keep it. Teams tend to ignore the costs imposed on other teams that results from them playing a blue card. This mimics how people think about polluting activities – e.g. ignore the air pollution damages that driving a car generates.

**How to talk about the game with students?** (the numbers below assume 15 teams, with 115 blue cards collected over the 5 rounds of the game)

Concept	In the Experiment
A private cost is a cost borne by the individual or entity making a decision.	Private cost of playing a blue card? -1 point.
An <b>external cost (EC)</b> is an uncompensated cost that an individual or firm imposes on others => known as a <b>negative externality</b> .	External cost of playing a blue card? -1 point x 14 other teams = -14 points.
<b>Social cost (SC) of a good or activity:</b> the cost of production plus its <u>external</u> cost.	-15 points for each blue card.
<b>Market failure</b> occurs when a market fails to be efficient.	Score if everyone held blue cards? 180. Highest score we saw? 85 (example)

**How to talk about the game (cont.)?** (the numbers below assume 15 teams, with 115 blue cards collected)

<b>Concept</b>	<b>In the Experiment</b>
What if each team were responsible for the costs that their actions imposed on other teams?	Private cost of playing a blue card? -15 points.
What is the externality if each team were responsible for the costs that their actions imposed on other teams?	External cost of playing a blue card? 0 points.
What would every team do if they were responsible for the costs that their actions imposed on other teams?	Retain each blue card.
What score would have been achieved if every team retained each blue card?	Score if everyone held blue cards? 180. Highest score we saw? 85 (example)

Scoring Sheet for “Why Price Pollution”

Team Number: \_\_\_\_\_

<u>Round Number</u>	<u>Base Points</u>	<u>Blue Cards Retained</u>	<u>Blue Card Points</u>	<u>Total Blue Cards Disposed Of</u>	<u>Total Blue Card Points</u>	<u>Round Score</u>	<u>Cumul. Score</u>
0	200	1	-2 (=1×-2)	13	-13 (=13×-1)	-15 (=-2+-13)	185
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____
						Total Score =	_____