

Lesson Five: What Can We Learn About Natural Monopolies by Looking at Electrical Power Companies?

Part 1: Opening Discussion (3-5 minutes)

The lesson begins with an opening question, which can be written on the board or projected. Students can discuss in pairs:

“Why do industries like electricity or cable TV have just one or two major firms while other industries like restaurants or clothes have hundreds or thousands? What might be a general difference that leads to some industries having many firms while others are dominated by just one or two?”

The purpose of this question is get students thinking about the differences in the industry structure of different products. Hopefully, students will recognize the natural differences between providing Cable TV or electricity (High start up, very low marginal (additional) cost for each additional customer) as opposed to restaurants that have low start up costs, but a high cost of food and space for each additional customer. Have students share answers aloud, and feel free to write down student responses.

Part 2: Introductory Reading (5 minutes)

The lesson continues with an introduction, definition, and explanation of natural monopolies. At the bottom of the first page, there are 3 questions which provide the layout to the entire lesson as each activity is designed to answer each question in sequence. This section of the lesson sets up the exploration into natural monopolies.

First, pass out the “Natural Monopolies” Handout. Have students read the introduction section aloud. Reading options include going around the room, popcorn reading (where a student reads and then chooses the next reader), etc. Stop after reading the three questions at the bottom of the first page. Check for student understanding of the definition of a natural monopoly, and how it related to infrastructure. Also, check that students understand the three questions that lay out the lesson.

Part 3: Investigating Question 1 and Power Company Activity (15 minutes)

In part 3, students will explore the answer to the first question about the characteristics and inevitability of natural monopolies. This section includes a brief reading which introduces the ideas of economies of scale and average costs as essential to understanding the characteristics of a natural monopoly. Have students read the second page of the “natural monopolies” handout, which begins with: “*Question 1: What are natural monopolies and what makes them “natural”?*” This section can also be read aloud.

After reading, there will be an activity designed to turn the classroom into a city, and create a power company to supply electricity to the city. The activity is entitled “Creating a power company in your classroom!” There are 3 variations of the activity with version 1 being the simplest (5-10 minutes), version 2 as medium complexity (10-15 minutes), and version 3 as the most complex (15-20 minutes). Below are the instructions for each activity.

For Activity 1:

No materials needed

Procedure:

1. Create groups of 2-4 students
2. Hand out **Activity One (Version 1)**
3. Have student read the introduction
4. Count the number of desks in the room, and have each group answer the first 2 questions
5. Once each team has answered those questions, have each team share with the class what they calculated. After sharing, ask the class to imagine there were two power companies in the classroom. And complete the remaining questions.
6. Share results with the class and discuss how they reflect whether electricity is a natural monopoly.

Note: Feel free to include the ideas of economies of scale and average costs in the final discussion, particularly if taught in an economics classroom.

For Activity 2:

Materials Needed: graph paper

Procedure:

1. Create groups of 2-4 students
2. Hand out: **Activity One (Version 2)**
3. Have students read the introduction.
2. Give each group one piece of graph paper
3. Have students trace out of the layout of the desks/tables in the classroom
4. Now, have students figure out a strategy of where to place the power plant(s) to be most efficient and how to lay the power wires for your city (classroom).
5. After completing first two questions, ask students/teams to share
6. Then, have students imagine there are two power companies in the city. Complete the rest of the questions.
7. Share results with the class and discuss how they reflect whether electricity is a natural monopoly.

Note: Feel free to include the ideas of economies of scale and average costs in the final discussion, particularly if taught in an economics classroom.

For Activity 3:

Materials Needed: graph paper, tape measure/ruler, and string

Procedure:

1. Create groups of 2-4 students or allow class to remain as a group (teacher's choice)
2. Hand out: ***Activity One (Version 3)***
3. Have students read the introduction.
4. Tell students as a class (or in groups) to figure out a strategy of where to put the power plant(s) to be most efficient and how you will lay the power wires for your city (classroom).
5. Have students use the tape measure to calculate the total number of inches of wire needed to connect the whole city (classroom).
6. Then have students answer the first two questions.
7. After sharing answers, have students repeat with two power companies, then answer the remaining questions.
8. Share results with the class and discuss how they reflect whether electricity is a natural monopoly.

Note: Feel free to include the ideas of economies of scale and average costs in the final discussion, particularly if taught in an economics classroom.

Part 4: Investigating Questions 2 and 3 (15 minutes)

In part 4, students will explore the answer to the second and third questions about the dangers of natural monopolies and possible solutions to overcome those dangers. Hand out Question 2 and 3 handout, “What problems are caused by Natural Monopolies?” Read the short introduction sentences aloud and then in pair or group, have the students brainstorm issues that might arise with natural monopolies. Here, we want students to think about real world implications of monopoly power and understand that natural monopolies, though sometime inevitable, should not be ignored. After students discuss and write their answers, share answers as a class. Possible answers might include (though not limited to):

- Monopoly Pricing (charging a price well above the cost of production)
- Lower quality product or service with no fear of competition
- Less innovation due to lower competition
- Paying a low wage (if they are also the only hiring firm of a certain type of labor (This is called a monopsony))
- Bundling: using monopoly power in electricity to force consumers to buy certain complimentary products: Like a washer/dryer produced by the electric company that only works with the electric company’s type of plug or wiring.

After debriefing, read the few sentences at the bottom of the page which lead into the third question. Repeat the procedure for the third question. Here we want students to understand both free market and governmental interventions that might help mitigate some of the negative effects of natural monopolies. Some answers students may come up with include:

- Setting a price ceiling (a legal maximum price) that power companies can charge. These price controls are usually aimed to keep the power company profitable, but without allowing them massive profits at the expense of consumers.
- Government provision of the good/service (Government owns and runs the power grid)
- Government subsidizing the industry to encourage the existence of two competing companies.
- Government forcing the company to provide a certain amount of electricity or to charge a set price, and then using a subsidy to ensure that the power company remains in business.
- Government encouraging innovation and research, and providing subsidies, that might provide alternatives to the electric company (i.e.: rooftop solar panels)
- Allowing the free market to act in hopes that the high profits will encourage innovation by potential competitors

After brainstorming solutions, have students complete the discussion at the bottom of the page about ranking their answers. Feel free to share rankings as a class and see what the class feels would be the best solution(s).

Part 5: Wrap-Up Activity and Role Play (10-15 minutes)

In part 5, students will conduct a role play activity in which they simulate different real life groups lobbying the government for desired legislation. The purpose of this activity is to bring together all the information from the definition and nature of a natural monopoly to the problems caused by natural monopolies and possible solutions. It is also to force the students to analyze and apply the material in real life scenario.

Hand out “Wrap up Activity”. Read scenario aloud, and then divide the class into three groups as labeled on the sheet. Give students time to discuss the written questions and then once prepared, each group picks a representative. Then, each group will have a chance to lobby the government from their perspective and the government will get to decide what to do. By the end of the activity, students should have a strong grasp of the winners/losers of a natural monopoly as well as the dilemma facing government regulators.

Part 6: Homework

After the lesson is completed, a homework assignment is provided to reinforce the material and connect it to the students’ own world. This assignment is designed to take the theoretical study above and make it concrete for your specific school or area. It is also designed to take no more than 20-30 minutes, though it does require internet research.

The challenge questions are a follow-up activity that reinforces activity one completed earlier in the lesson. It requires some math, but will allow the lesson to be based strongly in the real world for your students.