

# Teaching Market Structures with a Competitive Gum Market

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## Lesson Authors

Curt Anderson, Ph.D., Professor Emeritus, University of Minnesota-Duluth  
Scott Wolla, Ph.D., Federal Reserve Bank of St. Louis

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## Standards and Benchmarks (see page 10)

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## Lesson Description

In this lesson, students participate in an activity that demonstrates a key economic idea: The level of competition in an industry is a major determinant of product prices. Students are placed in groups that replicate four competitive conditions—perfect competition, monopoly, competitive oligopoly, and collusive oligopoly. Students act as firms in each industry competing to sell their product to the teacher (acting as a consumer). Through the market activity, students learn that when many firms are competing in an industry, prices begin to reflect the cost of production, whereas a single seller can command a high price. They also learn how collusion can result in groups of sellers behaving as monopolists.

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## Grade Level

High School or College

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## Concepts

- Barriers to entry
- Collusion
- Market structure
- Monopoly
- Oligopoly
- Perfect competition

### Objectives

Students will be able to

- distinguish among various market structures,
- demonstrate the effect of competition on prices, and
- demonstrate the effect of collusion on prices.

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### Compelling Question

How does the level of competition among sellers affect the price consumers pay?

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### Time Required

45 minutes

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### Materials

- PowerPoint slides
- *Handout 1: Assessment*, one copy for each student
- A stick of gum or other small item for each student
- A sheet of paper and a pencil for each student
- \$4 in quarters and other coins

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### Procedure

1. Begin the lesson by discussing the following:
  - How are prices determined? (*Prices are determined by supply and demand; prices are determined by buyers and sellers in a market; sellers determine the price.*)
  - How does competition play a role in markets? (*Sellers compete with other sellers to sell goods and services to consumers; buyers compete with other buyers to buy goods and services from sellers.*)
  - Do you think it matters how many sellers are selling the goods? (*Answers will vary.*)
  - Do you think sellers are mostly competing or mostly cooperating with one another? (*Answers will vary.*)
2. Distribute a sheet of paper to each student (or have them get a sheet of paper from a notebook) and ask students to write their name on it. Tell students they will use this paper to record prices later in the activity.

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3. Ask for volunteers who would like to earn some money (show a handful of coins). As students volunteer, assign them to groups in the following fashion. Have each volunteer bring their paper and a pencil with them.
  - Station one student in the front of the classroom on one side of the room. This is Group 1.
  - Station three students in the front of the classroom on the other side of the room. Tell these students they are allowed to talk to one another during the activity. This is Group 2.
  - Station three students in the back of the classroom but have them stand apart from one another (one on each side of the classroom and one in the middle). Tell these students they cannot talk to one another. This is Group 3.
  - Tell the rest of the students that they will make up the final group. They can remain in their seats. Tell these students they are allowed to talk to one another during the activity. This is Group 4.
  
4. Point out to everyone that you have divided the class into the following four groups:
  - Group 1: a single student
  - Group 2: three students who are allowed to talk among themselves
  - Group 3: three students (those in the back of the room) who are not allowed to talk one another
  - Group 4: the rest of the class, who are allowed to talk among themselves if they wish

[NOTE: This is intended for class sizes of around 20 or more students. For smaller classes, use only two students in Groups 2 and 3.]
  
5. Pass out a piece of gum or other small item to each student in all groups. Give the following instructions:
  - Each of you now holds a very valuable item that you may sell.
  - I (the teacher) am a buyer interested in purchasing the item you have.
  - I am going to buy one and only one item from each group; that is, I will buy one from Group 1, one from Group 2, one from Group 3, and one from Group 4.
  - I am willing and able to pay up to \$1 for each item, but I am looking for the best deal I can get. In other words, I will be buying from the seller offering to sell at the lowest price.
  - You will have two minutes to think and talk (if you are in Groups 2 and 4), and then each of you should write down the minimum you would be willing to accept for your item.
  - After two minutes, I will buy from the person in each group who has the lowest bid. The rest of you will receive no money.
  - Keep in mind that you are only competing with the people in your group.
  - In the event of a tie, I will randomly choose which of the low bidders to buy from.

[NOTE: Remind students that Group 3 may not talk to one another but that Groups 2 and 4 may talk among themselves.]

6. Tell students to begin. Wait two minutes while students are thinking and writing down their bids. Make sure that students in Group 3 are not talking to one another, but encourage Groups 2 and 4 to talk. At the end of the two-minute period, tell students to stop writing and put their pencils down.

Address each group in the following order:

7. **Group 1.** Collect the Group 1 bid. Point out to the class that this group has only one student.
  - Ask the class what they would have bid in this situation. (*Most recognize the lack of competition and say \$1.*)
  - Reveal the Group 1 bid and pay that person.
  - Record the number of sellers, ability to communicate, and bidding results for Group 1 in the table on Slide 2 (projected using a document camera or interactive whiteboard).
8. **Group 2.** Collect the Group 2 bids. Point out to the class that this group has few sellers and that they could talk to one another.
  - Ask the class what they would have bid in this situation. (*Most see the collusion possibilities. In other words, students in Group 2 might make a deal that they will all write down \$1 and agree to split the money among themselves afterward.*)
  - Reveal the Group 2 bids.
  - Choose the lowest bid and pay that person.
  - Record the number of sellers, ability to communicate, and bidding results for Group 2 in the table on Slide 2.
9. **Group 3.** Collect the Group 3 bids. Point out to the class that this group has few sellers and that they could not talk to one another.
  - Ask the class what they would have bid in this situation. (*Answers will vary.*)
  - Reveal the Group 3 bids.
  - Choose the lowest bid and pay that person. (*Typically the lowest bid ranges from \$0.25 to \$1.*)
  - Record the number of sellers, ability to communicate, and bidding results for Group 3 in the table on Slide 2.
10. **Group 4.** Finally, reveal the Group 4 bids. Point out to the class that this group has many sellers and that they could talk to one another.

- Ask the class what they would have bid in this situation. (*Answers will vary. Students may realize that the number of competitors might result in a low price.*)
  - Choose the lowest bid and pay that person. (*The lowest bid here usually ranges from \$0.01 to \$0.10.*)
  - Record the number of sellers, ability to communicate, and bidding results for Group 4 in the table on Slide 2.
11. Display Slide 3 as a reference and tell students that each group represented a different market structure. Use the following information to summarize Group 1:
- Group 1 represented a monopoly.
  - A **monopoly** is a market for a good or service where there is only one supplier, or that is dominated by one supplier.
  - Where did the Group 1 price rank in order from highest to lowest? (*It's probably among the highest prices; refer to the Slide 2 table if necessary.*)
  - Why do you think the monopolist was able to earn a high price? (*It's because this student was not competing; the student could offer the highest price the buyer was willing to pay—in this case \$1.*)
  - What would have happened if additional sellers were able to enter Group 1? (*Prices would have been lower because the sellers would have competed with one another.*)
  - There is only one seller in monopolistic markets because there are often high barriers to entry and no close substitutes for the product.
  - **Barriers to entry** are factors that make it difficult for a new firm (seller) to enter a market.
  - In real life, monopolistic markets are rare. Most commonly, they occur because government has granted a single firm the opportunity to supply a good or service. This is known as a “natural monopoly.” Examples include electric and natural gas providers, for which the infrastructure of wires and pipes entering peoples’ homes makes it less costly for one firm to provide the good or service than does building the infrastructure necessary for true competition. In exchange, government often regulates prices in these markets to ensure that these firms do not take advantage of their market power. And, there are no good substitutes for electricity for lighting your home or business (having no close substitutes is an important characteristic of monopolies).
12. Continue debriefing the activity using Slide 3. Use the following information to summarize Group 2:
- Group 2 represented collusive oligopoly (a few colluding sellers).
  - An **oligopoly** is a market structure in which a few large firms (sellers) dominate a market.
  - **Collusion** is an illegal agreement among firms to divide the market, set prices, or limit production.

- Where did the Group 2 price rank in order from highest to lowest? *(It's most likely a high price; refer to the Slide 2 table if necessary.)*
- Why do you think it ranked closer to the monopolistic market than Groups 3 or 4? *(Because sellers conspired to keep prices high rather than competed with one another)*
- What role did collusion play in the resulting price? *(It kept the price higher than it would have been if sellers were competing.)*
- While its power to collude has diminished due to new technologies, The Organization of Petroleum Exporting Countries (OPEC) was long held as an example of collusion. Because they dominated oil production, the oil-producing countries in OPEC attempted to agree on prices for oil and the amount of oil each country would sell in order to keep the price of oil high.

[NOTE: It may be that the three students agreed to collude, but then when writing down the price one or more of them “cheated” and underbid to ensure they sold their item. For example, two students may have written a price of \$1, but the third wrote a price of \$0.75. This is not uncommon in cases of collusion in the actual economy.]

13. Continue debriefing the activity using Slide 3. Use the following information to summarize Group 3:
  - Group 3 represented a competitive oligopoly (a few competing sellers).
  - Where did the Group 3 price rank in order from highest to lowest? *(It's most likely a low price; refer to the Slide 2 table if necessary.)*
  - The number of people in Groups 2 and 3 were the same. Why was the selling price in Group 3 lower than the selling price in Group 2? *(It was lower because the sellers were competing rather than cooperating with one another.)*
  - Examples of oligopolistic industries include search engines (e.g., Google, Yahoo, and Microsoft) and wireless telecommunications (e.g., AT&T, Verizon, and T-Mobile).
14. Continue debriefing the activity using Slide 3. Use the following information to summarize Group 4:
  - Group 4 represented perfect competition (many sellers of an identical item).
  - **Perfect competition** is a market in which there are many buyers and many sellers of an identical product.
  - Why do you think Group 4 prices were lower than other groups? *(There were many sellers, and they were all competing with one another.)*
  - Note that the price in the competitive situation (\$0.01 to \$0.10) roughly equals the cost of the gum, illustrating that competition tends to drive the price down to cost.

- In real life, perfectly competitive markets are rare. For example, farming is often used as an example of perfect competition because there are many farmers growing identical crops, such as corn or soybeans.
15. Remind students that Groups 2 and 4 were both allowed to talk. Ask students why they think collusion occurred in Group 2 but not in Group 4. (*Answers will vary.*) Propose the following two reasons:
- Collusion would have been much more difficult for Group 4 because it would have been too easy for someone to cheat on the collusive agreement to all write down \$1.
  - Collusion wouldn't have been as profitable for Group 4, because \$1 would have had to have been divided among many more people, so the reward from colluding would not have been that much.
  - This reasoning reflects the actual economy, where collusion is more likely when a few large firms dominate an industry, rather than when many smaller firms compete.
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### Closure

16. Display Slide 4. Discuss the following to review the lesson:
- Which market structure resulted in the highest price? Why? (*Monopoly, because there was one seller and no competition*)
  - Which market structure resulted in the lowest price? Why? (*Perfect competition, because there were many sellers all competing with one another*)
  - When comparing the two oligopolistic groups (Groups 2 and 3), what role did collusion play in setting the price? (*Collusion resulted in sellers cooperating rather than competing, and the price was higher.*)
  - How does the level of competition among sellers affect the price consumers pay? (*More competition generally results in lower prices for consumers.*)
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### Assessment

17. Distribute a copy of *Handout 1: Assessment* to each student. Allow time for the students to work and review the answers as follows:
1. Barriers to entry      *B*
  2. Collusion              *D*
  3. Monopoly              *A*
  4. Oligopoly              *C*
  5. Perfect competition    *E*
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6. Generally, what is the relationship between the number of sellers (competition) in a market and the price consumers pay?

*More sellers means more competition, and this usually results in lower prices.*

7. Why does this occur?

*More sellers are competing for buyers' money. In order to sell their goods, they must offer a lower price.*

8. How does collusion affect the level of competition and the price?

*Collusion is an effort to reduce competition by making agreements with other sellers. This will result in higher prices.*

9. Use each of the vocabulary words above to write a paragraph about a farmer who uses an internet search engine to learn if they can find another company from which to purchase electricity.

*Answers will vary. The following is an example:*

*A farmer competes in a perfectly competitive industry because there are many farmers and they produce crops that are identical. He wishes he could participate in collusion with other farmers to get a higher price for crops, but there are too many farmers to coordinate in that fashion—plus, it's against the law. The farmer is using a search engine—probably from Google, Yahoo, or Microsoft because these three dominate the industry, which is an example of oligopoly. The farmer is hoping to find a new company to buy electricity from, but it is unlikely because electric companies usually have a monopoly. This occurs because the government has given one company the right to be the only supplier; in other words, the government has put up a barrier to entry that prevents other companies from competing.*

## Handout 1: Assessment

Write the letter of the definition next to the term that it best matches.

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|-----------------------------|---|
| 1. Barriers to entry ____   | A. A market for a good or service where there is only one supplier, or that is dominated by one supplier. |
| 2. Collusion ____           | B. Factors that make it difficult for a new firm to enter a market.                                       |
| 3. Monopoly ____            | C. A market structure in which a few large firms dominate a market.                                       |
| 4. Oligopoly ____           | D. An illegal agreement among firms to divide the market, set prices, or limit production.                |
| 5. Perfect competition ____ | E. A market in which there are many buyers and many sellers of an identical product.                      |
6. Generally, what is the relationship between the number of sellers (competition) in a market and the price consumers pay?
7. Why does this occur?
8. How does collusion affect the level of competition and the price?
9. Use each of the vocabulary words above to write a paragraph about a farmer who uses an internet search engine to learn if they can find another company from which to purchase electricity. Underline the vocabulary words you use in your paragraph.

### Standards and Benchmarks

#### Voluntary National Content Standards in Economics

#### Standard 9: Competition and Market Structure

Competition among sellers usually lowers costs and prices, and encourages producers to produce what consumers are willing and able to buy. Competition among buyers increases prices and allocates goods and services to those people who are willing and able to pay the most for them.

- **Benchmarks: Grade 8**

1. Sellers compete on the basis of price, product quality, customer service, product design and variety, and advertising.
2. Competition among sellers results in lower costs and prices, higher product quality, and/or better customer service. When competition among sellers is limited, sellers have some control over the prices they set.

- **Benchmark: Grade 12**

4. Collusion among buyers or sellers reduces the level of competition in a market. Collusion is more difficult in markets with large numbers of buyers and sellers.