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Noodlenomics: Using Pool Noodles to Teach Supply and Demand

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Most middle school and high school economics courses discuss supply and demand. The difficulty level of this lesson varies by grade level, required state standards, and the instructor’s comfort level with the material. Some teachers may present the concepts of supply and demand theoretically, discussing relationships between prices and quantities without including a graphical illustration. Other instructors may emphasize graphing of supply and demand and spend little time on discussing the relationship between prices and quantities. It is important that students receive a mix of both conceptual discussion of variable relations as well as practice graphing (Lowrie & Diezmann, 2007; Marks & Kotula, 2009; Wall & Benson, 2009). The classroom activity described in this paper is designed to help teachers offer both a conceptual discussion and practice graphing.

The concept of supply and demand incorporates several of the key learning objectives found in the national standards for economics as well as many state content standards. Supply and demand are often taught in very basic terms at the elementary level. Students learn that suppliers sell goods and services, and buyers demand goods and services. Students at the junior high and high school level, however, discuss supply and demand in more detail. Graphing supply and demand requires a certain comfort level with graphing that some students do not currently have. The purpose of this paper is to provide an activity-based lesson that will allow students to practice supply and demand in a fun learning environment. More specifically, the lesson in this paper provides practice labelling graphs as well as demonstrating and interpreting effects of shifts in supply and demand.

Correlation with Social Studies Standards

A recent study by the Council on Economic Education (2013) states that for the first time ever, all 50 states and the District of Columbia include economics in the required K-12 standards. Economics has traditionally been included in the social studies standards due to the subject’s ability to relate concepts such as scarcity, choice, and resources to social studies classes including...
history, geography, and civics. The role of supply and demand in the College, Career and Civic Readiness (C3) Framework for Social Studies State Standards as well as the Common Core State Standards (CCSS) is shown in Table 1 below. The standards are arrayed by grade level with the expectation that by the end of that grade, students will be able to satisfy the learning objective listed. C3 standards include learning objectives listed under the category Exchange and Markets. Common Core standards include English language arts (ELA) learning objectives with an emphasis on speaking and listening (SL) as well as history/social studies (RH).
Table 1

**Correlation with Common Core and C3 Standards**

<table>
<thead>
<tr>
<th>Grades 6-8</th>
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<tbody>
<tr>
<td>CCSS.ELA-Literacy.RH.6-8.7</td>
<td>Integrate visual information (e.g. in charts, graphs, photographs, videos, or maps) with other information in print and digital texts</td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.SL.8.4</td>
<td>Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.</td>
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<tr>
<td>D2.Eco.3.6.8</td>
<td>Explain the roles of buyers and sellers in product, labor and financial markets.</td>
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<tr>
<td>D2.Eco.6.6-8</td>
<td>Explain how changes in supply and demand cause changes in prices and quantities of goods and services, labor, credit, and foreign currencies.</td>
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<tr>
<td>Grades 9-10</td>
<td></td>
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<tr>
<td>CCSS.ELA-Literacy.RH.9-10.7</td>
<td>Integrate quantitative or technical analysis (e.g. charts, research data) with qualitative analysis in print or digital text.</td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.SL.9-10.4</td>
<td>Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.</td>
</tr>
<tr>
<td>Grades 11-12</td>
<td></td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.RH.11-12.7</td>
<td>Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g. visually, quantitatively, as well as in words) in order to address a question or solve a problem.</td>
</tr>
<tr>
<td>CCSS.ELA-Literacy.SL.11-12.4</td>
<td>Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.</td>
</tr>
<tr>
<td>D2.Eco.3.9-12</td>
<td>Analyze the ways in which incentives influence what is produced and distributed in a market system.</td>
</tr>
<tr>
<td>D2.Eco.6.9-12</td>
<td>Generate possible explanations for a government role in markets when market inefficiencies exist.</td>
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Practice with Labeling

Students may sometimes feel like they are trapped in a bowl of alphabet soup when trying to label a supply and demand diagram. There are several areas of a graph that need to be labeled including the market observed, price and quantity axes, supply and demand curves, as well as equilibrium price and quantity. Labels can be constructed out of card stock for the following items: Market, Price, Quantity, \( P_1 \), \( Q_1 \), Supply\(_1\) and Demand\(_1\).

Setting Up the Classroom

Painters tape can be used to mark the vertical and horizontal axes of the diagram while pool noodles are great to use for supply and demand curves within the graph. Lastly, cords of yarn (about 2 yards in length) are very helpful to align the initial price \( (P_1) \) and quantity \( (Q_1) \) with the initial equilibrium point. This is recommended to show students how initial prices and quantities are determined and illustrated on the graph. Students can be divided into groups of 2-4, depending on the size of the class. As a group the students must construct a supply and demand diagram at initial equilibrium. The diagram should look like the illustration provided in Figure 1.

Figure 1: Noodlenomics – Initial Equilibrium

Practice with Shifting Supply and Demand

Once students are comfortable with labeling the initial equilibrium between supply and demand, it may be time to introduce the process of shifting supply or demand curves. This can be
done using the same student groups created in the previous section. Next, the instructor distributes the Supply and Demand Group Problems to the various groups. The Supply and Demand Group Problems are provided in Appendix A at the end of the paper. Each group problem provides an economic event and the affected product market. Table 2 provides a few sample economic events and affected product markets below. Appendix B provides an answer key for these problems at the end of the paper.

Table 2

Sample Economic Events

<table>
<thead>
<tr>
<th>Economic Event</th>
<th>Market</th>
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<tr>
<td>Sunhats are very popular this year among consumers.</td>
<td>Sunhats</td>
</tr>
<tr>
<td>The town of Flavorville has had a large increase in the number of pickle vendors.</td>
<td>Pickles</td>
</tr>
<tr>
<td>The closing down of several local firms has lowered income levels in the region.</td>
<td>Flat screen televisions</td>
</tr>
</tbody>
</table>

Student Group Presentations

Student groups will then take turns illustrating events described in their cards. The groups will need the materials from the previous section along with an additional pool noodle, two more cords of yarn, and new labels for $P_2$, $Q_2$, Supply$_2$, and Demand$_2$. Each group presentation will begin by showing the initial equilibrium demonstrated previously in Figure 1. The additional pool noodle can be used to represent the newly shifted curve. New labels can then be added along with the new cords of yarn to illustrate the new equilibrium price and quantity ($P_2$ and $Q_2$). A few examples of completed graphs are shown in Figures 2 and 3 below.

Graphing Examples

Figure 2 shows an increase in demand. As the demand curve shifts up (to the right), a new equilibrium is formed showing a higher resulting price ($P_2> P_1$) and quantity ($Q_2> Q_1$) of the good. Likewise, Figure 3 illustrates a decrease in supply. As the demand curve shifts down (to the left), a higher price level ($P_2> P_1$) and lower quantity ($Q_2< Q_1$) provides the new equilibrium. An answer key showing the resulting shift in supply or demand along with the change in price and quantity is provided in Appendix B at the end of the paper.
Figure 2 & 3: Noodlenomics – Shifts in Supply & Demand

To provide additional practice with labeling and graphing, market labels for the supply and demand problems can be used. To do this, you will need to create the following labels: Sunhats, Pickles, Pez Dispensers, Flat Screen TVs, Toilet Paper, Strawberry Ice Cream, Hot Dog Buns, Ladies Apparel, Margarine, and Manufactured Goods. Use of market specific labels will require students to think about the actual market impact as well as the economic event. Labels for arrows may also be helpful in reinforcing students’ understanding of directional change of prices and quantities within the supply and demand diagram.

Comfort with Graphing

Previous studies emphasize the Four Resources Model of Literary Education to help teachers and students acquire a better understanding of visuals such as charts and graphs (Freebody & Luke, 2003; Quinnell, 2014). This learning model divides literacy into four core competencies: code breaking, meaning making, text using, and critical analyzing. We will discuss each of these competencies in detail, showing how the activities described here meet each of the competencies listed above.

Code breaking focuses on “cracking the codes of text,” according to Quinnell (2014). In other words, students must first observe and identify characteristics of the visual such as...
abbreviations, labels, keys, scales and use of colors. Postigo and Pozo (2004) refer to this competency as the processing of explicit information. Students should be encouraged, at this point, to draw on prior knowledge of familiar representations to assist in the understanding of unfamiliar representations (Lowrie & Diezmann, 2007; Marks & Kotula, 2009; Wall & Benson, 2009). Groups receive an opportunity to break the code of supply and demand by looking at samples of supply and demand diagrams and forming a plan to graph their given market event.

Meaning making refers to the process where students focus on making meaning of the text at hand (Quinnell, 2014). Students observe key messages and draw inferences based on new information presented as well as prior experience and cultural background. This core competency is also referred to as the processing of implicit information according to Postigo and Pozo (2004). By comparing data points and investigating relationships in the data, students can then make predictions and/or inferences. As student groups label their constructed graphs and set up the supply and demand curves, they are essentially meaning making of the diverse attributes observed in the graphical model.

The process of students identifying the purpose and audience of the visual is known as text using (Quinnell, 2014). Text using allows for the use of varying texts and/or formats. The experience of setting up the supply and demand diagram to present to the class differs from that involved in drawing the graph on paper as an individual exercise. Both exercises are important for students to acquire a comprehensive understanding of supply and demand fundamentals, but each exercise requires different uses of text.

Critical analysis relates to students uncovering any message bias that may be conveyed by text (Quinnell, 2014). It is important to further extend understanding by including investigation of representations with varied purposes (Lowrie & Diezmann, 2007). This critical exercise will help students understand graphs that may be misleading due to author bias or error, improving comprehension skills and leading to higher scrutiny for graphical illustrations.

Concluding Remarks

Increased emphasis on interpretation of graphical illustrations in Common Core as well as College, Career and Civic Life (C3) standards has increased the need for student lessons designed to address these learning objectives. Activity-based exercises are designed to enhance graphical literacy and help to make learning fun by actively engaging students. The activities discussed in this paper provide educators with hands-on lessons for teaching supply and demand graphically at the middle school or high school level. These lessons will help educators engage students through teamwork and classroom presentations.
References


Appendix A

Supply and Demand Group Problems (Sample):

1. **Event:** Sunhats are very popular this year among consumers.  
   **Market:** Sunhats

2. **Event:** The town of Flavorville has had a large increase in the number of pickle vendors.  
   **Market:** Pickles

3. **Event:** The price of plastic has doubled over the past week.  
   **Market:** Pez Dispensers

4. **Event:** The closing down of several local firms has lowered income levels in the region.  
   **Market:** Flat screen televisions

5. **Event:** Buyers hear that the price of toilet paper will increase in the near future.  
   **Market:** Toilet paper

6. **Event:** Severe drought has devastated the strawberry harvest.  
   **Market:** Strawberry ice cream

7. **Event:** The price of hot dogs increases.  
   **Market:** Hot dog buns

8. **Event:** Clothing retailers hear that the price of women’s clothing will decrease dramatically over the next few weeks.  
   **Market:** Ladies apparel

9. **Event:** The price of butter decreases.  
   **Market:** Margarine

10. **Event:** Technological advancements have led to higher productivity levels in manufacturing.  
    **Market:** Manufactured Goods
### Appendix B

**Group Problems: Answer Key**

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