

## Market to Market

# Market to Market Lesson Plan

This lesson focuses on the task and uncertainty of moving goods from one place to another via transportation infrastructure. Students play a game to determine the fastest and most profitable way to move soybeans from city to city. Teacher instructions, student pages and game board are included.

### **Sequence**

Lesson 1 of the unit: Market-to-Market

### **Time**

50 minutes

### **Grade Level**

9-12

### **Materials**

Game board  
Export and import cards  
Chance cards

### **Objectives**

Students will make decisions based on price and routes available to move grain from city to city.  
Students will compete to make the most money while accomplishing the objective of moving grain.

### **Vocabulary**

Infrastructure, Agriculture, Production, Yield, Waterway

### **Prior Knowledge**

Students should have a basic understanding that food is grown in some parts of the country and not others, that movement of food is necessary, and that countries barter and trade food resources in a global economy.

## 5E Plan

### **Engage**

To begin this lesson, ask your students what they like to eat and where they think the ingredients come from. Is there any food they have noticed that is less available recently than in years before? Once they have had a moment to formulate answers, lead a class discussion. Be sure to ask probing questions, such as "What devices or strategies do you think were used to bring the food to your plate?"  
Allow about five minutes for classroom discussion, being sure to hear from a diverse group of students.

### **Explore**

Play Market-to Market. Divide the class into groups of 3-4 students. Each group of students works for a grain cooperative or transportation company. Have each set of students draw one starting point (grain bin) card and a destination (star) card. Project the map of the United States on your classroom screen or pass out maps to each table. Have students reference the game play instructions and use the table of values to help them determine their costs. Remind students their goal is to decide on the most economical route to get their soybeans from city to city for export.

### **Explain**

Divide the class to read one of the articles below. Have students record their reactions by using a Four Notes Summary Protocol where they write down something for each of the following:

*Ohhh!* (something that was interesting)

*Aaah!* (something that was an ah-ha moment)

*Hmmm...* (something that left them wanting to know more)

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*Huh?* (a question they have after reading)

Ask students to share their reactions to the prompts in table groups, then ask one person from each group to summarize to the class. Allow addition to the discussion from groups who read the same articles.

Read: <https://www.unitedsoybean.org/hopper/u-s-soy-achieves-record-export-volume-for-20-21-marketing-year/> to become aware of the markets importing US soybeans. Have students show graphic from article when they share the highlights “Top 20 U.S. Soy Destination Markets.”

Read: <https://www.unitedsoybean.org/hopper/checkoff-helps-to-export-soybean-meal/> to see how soybean farmers are investing in additional infrastructure to help transport and export soybean meal.

Read: U.S. Department of Agriculture’s [Soybean Transportation Profile](#) to see how well the United States transportation industry operates.

Listen to <https://ocj.com/2023/11/ohio-soybean-production-and-the-great-lakes-shipping-network/>. This interview with Mike Steenhoek, Soy Transportation Coalition, describes the importance of the St Lawrence Seaway and the Mississippi River.

### Evaluate

Once students have completed the game, have them discuss the following questions:

1. After discussing the articles, what information might have been helpful to make the game play more understandable?
2. What was the most difficult part of the game?
3. What careers are involved in moving grain from place to place?

*engineers for building and maintaining infrastructure: locks, dams, river dredging, rail lines and rail bridges, roads and bridges*

*logistics experts to determine routes that are most economical;*

*grain buyers to obtain the grain from farmers;*

*tug boat operators to pull the barges; barge operators to pilot the barge; truck drivers, train operators*

*maintenance workers for trains, barges and trucks*

*computer operators for tracking shipments and troubleshooting*

*software designers for programming AI solutions*

*risk management (insurance values)*

*market solutions (investment or hedging risks)*

*grain logistics (monitoring computers tracking loading/unloading)*

*customer service*

*technicians and equipment operators (i.e. test grain moisture content; check weight for loads; manage load-out and off loading)*

*inventory management*

4. What might be done differently if playing the game again?
5. What problems were encountered while playing the game?

### Elaborate

Finally, if there is anything we have learned over the past few years between [the worldwide Covid-19 pandemic](#), [the cargo ship \*MV Ever Given\* getting stuck in the Suez Canal](#), and [the grain crisis resulting from the conflict in](#)

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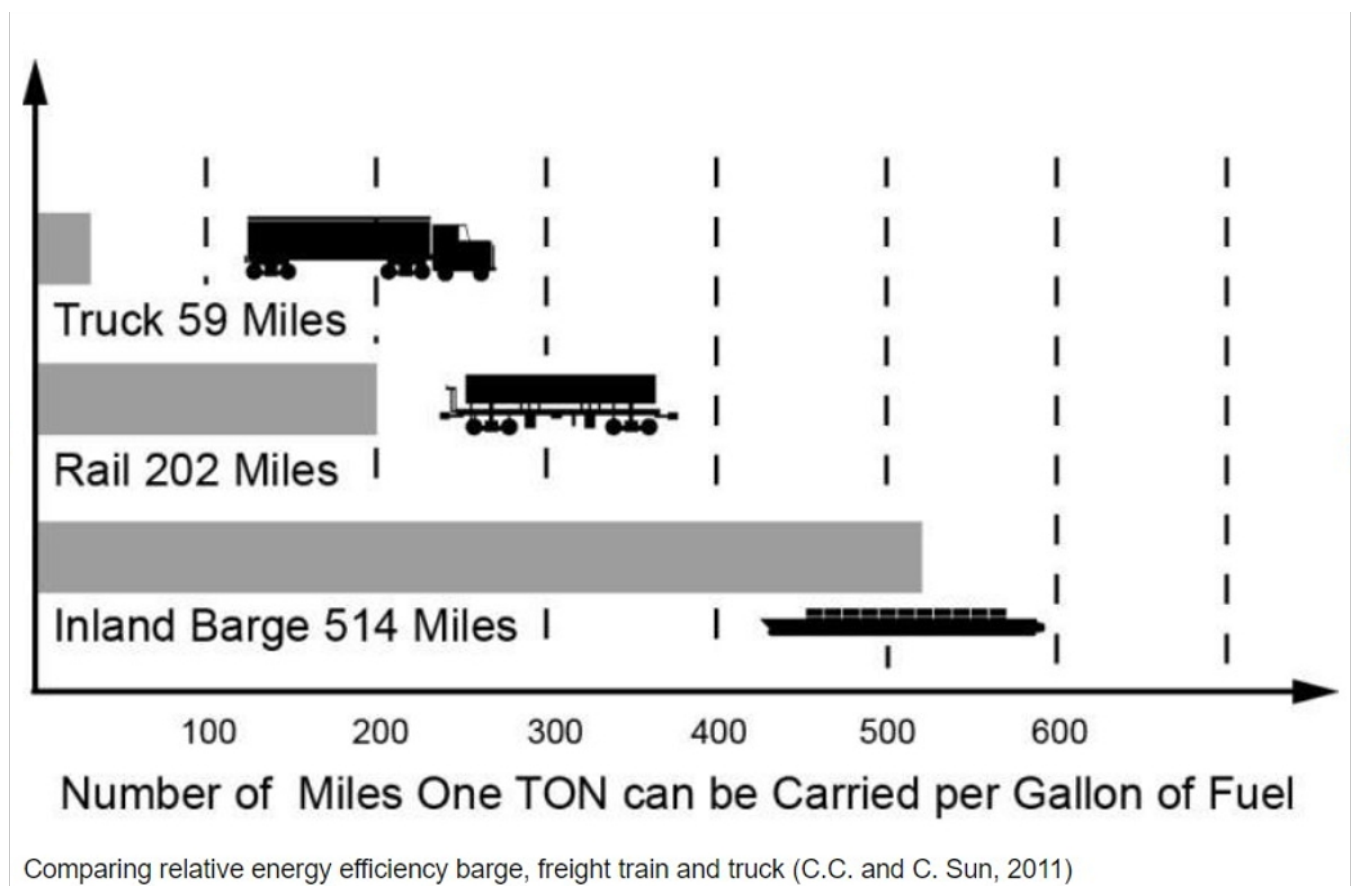
[Ukraine](#), trade logistics can be entirely derailed at a moment's notice. Have students skim, read or watch the links above. Have them talk about how they may solve some of these problems.

One additional resource: Read this case study ([https://www.anylogic.com/resources/case-studies/planning-agro-industrial-logistics-with-simulation/?utm\\_source=inbound\\_logistics&utm\\_medium=referral&utm\\_campaign=foodcrisis1122](https://www.anylogic.com/resources/case-studies/planning-agro-industrial-logistics-with-simulation/?utm_source=inbound_logistics&utm_medium=referral&utm_campaign=foodcrisis1122)) that helps students understand how software solutions may make a difference in solving supplier problems when planning to meet demand.

### Other options for elaboration

This activity might lead to a discussion about local foods and the efficiency of moving goods from place to place by truck or rail. See this chart to compare energy efficiency.

Have students determine what distance counts as local and what emissions are being given off by moving our food by road, rail or inland waterway.



Keep in mind that a bushel of soybeans weighs 60 lbs, so one ton (2000 lbs) of soybeans would be equal to 33.3 bushels. One gallon of fuel will move that ton of soybeans 59 miles. (A truck holds approximately 1000 bushels or 60,000 lbs.)

Addressing these NGSS DCIs

- ESS2D Weather and climate – why do certain crops grow in specific areas
- ESS2E Biogeology – how soils are developed
- ESS3A Natural resources – what resources are plentiful and necessary to grow crops

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- ESS3B Natural hazards – what impacts movement of goods
- ESS3C Human impacts on Earth systems – emissions and waste
- ESS3D Global climate change – changing climate impacts
- LS1B Growth and development of organisms – growing season differences
- LS2A Interdependent relationships in ecosystems – which areas are best for growing and why
- LS2C Ecosystem dynamics, functioning and resilience – stewardship of arable land
- LS2D Social interactions and group behavior – determine demand for goods

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