

Factors of Production and Economic Decision-Making

Overview

Students begin by learning what the four factors of production are. Students then work in small groups to categorize different factors of production for certain industries and consider topics such as limited resources and scarcity. The lesson concludes with students considering the economics decisions as they relate to scarcity, trade-off, and investment.

Grade

10

NC Essential Standards for American History: The Founding Principles, Civics & Economics

- FP.E.1.1 Compare how individuals and governments utilize scarce resources (human, natural and capital) in traditional, command, market and mixed economies.
- FP.E.1.2 Analyze a market economy in terms of economic characteristics, the roles they play in decision-making and the importance of each role
- FP.E.1.4 Analyze the ways in which incentives and profits influence what is produced and distributed in a market system

Materials

- Factors of Production, attached
- Economic Decision-Making and Answer Key, attached
- Poster/chart paper
- Markers
- LCD projector with laptop
- Sample test questions, attached
- (Optional)Word Wall with current content and academic vocabulary posted:
 - supply, demand, surplus, shortage, scarcity, factors of production/productive resources, natural resources, human resources/labor, capital resources, entrepreneurial resources, Chief Executive Officer (CEO), profit, loss, trade-offs, opportunity costs, efficient, productivity, specialization.
 - Keeping a continuous “Word Wall” posted in the classroom, on which the teacher and student alike can add vocabulary words, can serve as an important visual reminder regarding content learned.

Essential Questions:

- What are the four factors of production?
- How do the basic factors of production influence the choices made by producers and consumers?
- What effects do limited natural resources have on the choices made by producers and consumers?
- How are the four factors of production used in satisfying wants and needs?
- How does scarcity affect the production of goods and services?
- How do the four factors of production affect products you use every day?

Duration

60+ minutes

Procedure

1. Project the picture of a car such as the attached visual. First ask the students what their opinion of the car is to get them talking. Students will respond that it is a nice-looking car, depending on the visual chosen.

Then ask them to make a list of all the resources used in the production of the car. Write the students responses on the board. Try to elicit as many responses as possible. Possible response could include:

- Steel
- Rubber
- Glass
- Car designer
- Engineer
- Workers at a factory
- Supervisors and other bureaucracy positions
- Wood grain paneling
- Workers
- Industrial robots
- Electricity
- Factory
- Land for plant
- Owner of company, CEO, or financial risk-taker

Think-Pair-Share: Tell the students that you want them to brainstorm different ways to classify the list they produced. For example, students may categorize based whether the productive resource is alive or inanimate. They should think about a few categories that would include most or the entire list. After a few minutes of thinking, have the students share the classification method they created. They should choose the best classification method or a combination of the two.

2. Inform the students that economists have also created categories for the resources necessary to produce goods and services. In economics, the **factors of production** are the resources used to produce. The four factors include:
 - **Capital Goods** - a man-made factor of production used by labor in making other products. Includes tools, factories, machines, etc.
 - **Labor** - any form of human effort exerted in production. Also called human resources.
 - **Natural resources** - productive resources that are provided by nature - such as land, air, water, forests, coal, iron ore, oil, and minerals.
 - **Entrepreneurship** - the individual responsible for combining and organizing natural resources, capital goods, and labor to produce a good or service. Role could involve assuming the risks of business failure and/or providing the creativity and managerial skills necessary for production to take place.
3. Divide students into eight groups of 3-4 students. Provide each group with Factors of Production handout, scissors, glue, and a large piece of poster paper. Give students the following directions:
 - First, cut out each card from the hand out.
 - Second, categorize each card by the business/ institution that you think it belongs to.
 - Finally, glue the cards onto the poster paper organized by business and factor of production in some form of understandable organizational pattern.
4. Circulate around the room and assist students in devising organization pattern and identifying difficult factors. Some factors could logically be placed in multiple businesses.
5. Allow students to share their posters and then ask the class the following questions:
 - How does the entrepreneur make decisions about how much of a productive resource to use in production?
 - Which of the factors on your poster do you think are the most important for the production process? Does it depend of what business? Explain.
 - Which of the factors on your poster do you think are the least important for the production process? Does it depend of what business? Explain.
 - Which of the factors on your poster do you think are the cheapest for the entrepreneur to pay for in the production process? Why do you think so?
 - Which of the factors on your poster do you think are the most expensive for the entrepreneur to pay for in the production process? Why do you think so?
6. Inform the students that entrepreneurs consider many issues when making decisions regarding what factors to use and how much of each factor. Three important influences on entrepreneur's decisions are:

- **Scarcity-** Nearly all resources are scarce, meaning there is a limited supply available to meet unlimited wants. In a free and open market, the more scarce a resource is, the more expensive it is. This is an **inverse economic relationship**. When a fruit is out of season, supply is more scarce. This causes the price to increase because it is more valuable.
 - **Opportunity Cost-** Because resources are scarce, the choice to use a resource in one way means not using it in another. For example, to using a field to grow tobacco means the field cannot be used to grow soy beans.
 - **Productivity-** is a measure of the amount of output produced by a given amount of inputs. It reflects how efficiently resources are being used. This is also referred to as measuring **efficient use** of the factors of production. For example, the productivity of a farmer (labor) increases with the use of a tractor (capital). Investing in human capital is one way to increase productivity. **Human capital** refers to the quality of labor resources, which can be improved through investments in education, training, and health
 - In order for an entrepreneur to realize a profit, he/she must produce at a cost lower than the market price for the good or service. **Profit** is the money left over from selling a good or service after the cost of buying productive resources have been paid.
 - The entrepreneur must minimize the use of scarce resource in production and maximize the productivity of the factors used in production to keep cost as low as possible.
7. Explain to the students that they are now going to work in their small groups to consider some of the decisions entrepreneurs must face when producing goods and services. Pass out copies of “Economic Decision Making” to each student and instruct the students to work in their groups to answer the questions. Each student must have their own copy completed. For lower-level learners, extra assistance and a calculator may be necessary.
 8. Once the students have finished, review the answers as a whole class and discuss any issues or questions that may have arisen. Collect answer sheets for review.
 9. Administer the quiz to assess student understanding and retention of key vocabulary and concepts.

Visual for Warm-Up



Factors of Production

Directions:

1. Cut out the boxes below on the dotted lines. Be careful not to lose any of the slips!
2. Organize the boxes based on what business you think the productive resource would be used in. Your choices are: Restaurant, Bank, School, and a Textile Factory.
3. Organize the boxes based on what factor of production each would fall under. Your choices are: Natural Resource, Labor, Capital, and Entrepreneurship.
4. On the poster paper, glue the boxes organized by business and factor of production. You can make a chart, a web, or another form of graphic organization.
5. Use the markers to make the poster colorful and creative!

Teachers	Table Cloth	ATMs	Wood	Tables
Shipping Containers	Restaurant Owner	Computers	Electricity	Truck driver
Assembly Line Supervisor	Glass	Counselors	Superintendent	Dishwasher
Land	Cash Register	Air	Copy machine	White Board
Napkins	Television	Factory	Sports fields	Land
Supervisor	Security Officer	Hostess	Vegetables	Sales Person
Electricity	Overhead projectors	Candles	Restaurant Manager	Stockholders
Test Scan-trons	Safe Deposit Boxes	Bank President	Water	Calculators
Wood	Cotton	Principals	Quality Control Inspector	Steel
Oven	Paper	Assembly Line Workers	Table cloths	Silverware
Chief Executive Officer	Land	Sewing machine	Waiter/Waitress	Air

Desks	Glass	Financial Planner	Electricity	School Building
Meat	Chefs	Steel	Herbs/ Spices	Computers
Plates	Chalk Board	Bus Boy (Girl)	Accountant	Air
Drinking Glasses	Textile factory owner	Money Counter	Electricity	Cloth
Bank Manager	Pencils	Secretary	Vaults	Deep Fryer
Mop	Intercom	Alarm System	Accountant	Textbooks
Secretary	Air	Computers	Electricity	Bank Teller
Computers	Assembly line	Armored Truck	Gym	Broom
Land	Dye	Bank Building	Pans	Security Cameras

Economic Decision-Making

Part I: House Cleaning

As an after school job, you have started a house-cleaning business with your friend Raymond. The chart below lists the two main services your new business provides and how long it takes each of you to complete the service. Use the information to make decisions about how to maximize your productivity and thus make the most profit for your efforts. You and Raymond are planning to work for 3 hours a piece this afternoon

	You	Raymond
Vacuum per house	60 minutes	45 minutes
Wash the dishes and do the laundry per house	30 minutes	45 minutes

- a. If you choose to vacuum for the 3 hours, how many houses worth of dish/laundry would you forgo? This is your **opportunity cost** of vacuuming in terms of dishes/laundry.
- b. If you have Raymond vacuum a house for the 3 hours, how many houses worth of dish/laundry would you forgo? This is your **opportunity cost** of vacuuming in terms of dishes/laundry.
- c. If you choose to do the dishes and laundry for the 3 hours, how many houses worth of vacuuming would you forgo? This is your **opportunity cost** of vacuuming in terms of dishes/laundry.
- d. If you have Raymond do the dishes and laundry for the 3 hours, how many houses worth of vacuuming would you forgo? This is your **opportunity cost** of vacuuming in terms of dishes/laundry.
- e. One way to increase productivity is through **specialization**, or having workers focus on the task in which they have the lowest opportunity cost for.
 - i. Who should specialize in vacuuming?
 - ii. Who should specialize in washing dishes and doing the laundry?

Part II: Factory Work

Congratulations! After proving yourself as a keen young entrepreneur, you have been hired by a local factory as a manager. Assume that a business firm finds that its profit will be at a maximum when it produces \$40 worth of their product. Suppose also that each of the three techniques shown in the following table will produce the same amount of output.

Resource	Price of Resource	Technique #1	Technique #2	Technique #3
Labor	\$3	5	2	3
Land	\$4	2	4	2
Capital	\$2	2	4	5
Entrepreneurship	\$2	4	2	4

- a. With the resource prices shown, which technique will the firm choose? Why?
- b. Will production entail profit or losses?

- c. Assume now that a new technique, technique 4, is developed. It combines 2 units of labor, 2 of land, 6 of capital, and 3 of entrepreneurial ability. In view of the resource prices in the table, will the firm adopt the new technique? Explain your answer.
- d. Suppose that an increase in the labor supply causes the price of labor to fall to \$1.50 per unit, all other resource prices remaining unchanged. Which technique will the producer now choose? Explain your answer.

Part III: Economic Consultant

You have been acknowledged as an economic prodigy and will be selling your mad skills as a business consultant to Widget Inc. Answer the following questions using the following data which shows the current costs for resources used for producing 2000 units of a particular commodity:

Resource	Resource Price (per month)
Labor	\$30,000
Natural Resources	\$40,000
Capital	\$20,000
Entrepreneurial Ability	\$100,000

- a. Currently the Widget© is selling for \$100 a piece. Is Widget Inc. making a profit or taking a loss by producing? How large is the profit or loss?
- b. There are a number of proposal for how to increase revenues at Widget©. Choose which of the following proposals you think would be the most economically efficient and explain why.

Proposal 1: Widget Inc. is considering doubling the number of workers. The new workers would add \$30,000 to the cost of labor. The new workers would be able to increase the number of widgets by 1,500.

Proposal 2: Widget Inc. is considering hiring a new CEO with better managerial skills the current one. The new CEO would add \$50,000 to the cost of entrepreneurial ability. The new CEO would be about the increase the number of widgets by 1,000.

Proposal 3: Widget Inc. is considering buying a new piece of capital equipment. The machinery would add \$50,000 dollars to the cost of capital, but would replace the need for multiple workers reducing the cost of labor by \$15,000. The new capital would be able to increase the number of widgets by 1,700.

- c. What are possible costs and benefits for each of the proposals beyond the actual financial profit?

Economic Decision-Making- ANSWER KEY

Part I: House Cleaning

- a. If you choose to vacuum for the 3 hours, how many houses worth of dish/laundry would you forgo? This is your **opportunity cost** of vacuuming in terms of dishes/laundry. **6 houses worth of dishes/laundry**
- b. If you have Raymond vacuum a house for the 3 hours, how many houses worth of dish/laundry would you forgo? This is your **opportunity cost** of vacuuming in terms of dishes/laundry. **4 houses worth of dishes/laundry**
- c. If you choose to do the dishes and laundry for the 3 hours, how many houses worth of vacuuming would you forgo? This is your **opportunity cost** of vacuuming in terms of dishes/laundry. **3 house worth of vacuuming**
- d. If you have Raymond do the dishes and laundry for the 3 hours, how many houses worth of vacuuming would you forgo? This is your **opportunity cost** of vacuuming in terms of dishes/laundry. **4 houses worth of vacuuming**
- e. One way to increase productivity is through **specialization**, or having workers focus on the task in which they have the lowest opportunity cost for.
 - i. Who should specialize in vacuuming? **Raymond**
 - ii. Who should specialize in washing dishes and doing the laundry? **You**

Part II: Factory Work

- a. With the resource prices shown, which technique will the firm choose? Why? **Technique #2 because it only costs \$34 compared to #1 and #3 that both cost \$35**
- b. Will production entail profit or losses? **Profit of \$6**
- c. Assume now that a new technique, technique 4, is developed. It combines 2 units of labor, 2 of land, 6 of capital, and 3 of entrepreneurial ability. In view of the resource prices in the table, will the firm adopt the new technique? Explain your answer. **Yes, reduces cost to \$32**
- d. Suppose that an increase in the labor supply causes the price of labor to fall to \$1.50 per unit, all other resource prices remaining unchanged. Which technique will the producer now choose? Explain your answer. **Technique #1 because it costs only \$24.50**

Part III: Economic Consultant

- a. Currently the Widget© is selling for \$100 a piece. Is Widget Inc. making a profit or taking a loss by producing? How large is the profit or loss?
Profit of \$10,000
- b. There are a number of proposal for how to increase revenues at Widget©. Choose which of the following proposals you think would be the most economically efficient and explain why.

Proposal 1: Widget© is considering doubling the number of workers. The new workers would add \$30,000 to the cost of labor. The new workers would be able to increase the number of widgets by 1,500.

Proposal 2: Widget© is considering hiring a new CEO with better managerial skills the current one. The new CEO would add \$50,000 to the cost of entrepreneurial ability. The new CEO would be about the increase the number of widgets by 1,000.

Proposal 3: Widget© is considering buying a new piece of capital equipment. The machinery would add \$50,000 dollars to the cost of capital, but would replace the need for multiple workers reducing the cost of labor by \$15,000. The new capital would be able to increase the number of widgets by 1,700.

Proposal 3 because it would increase profits by \$135,000. Proposal 1 increased would increase profit by \$130,000 and Proposal 2 would increase profit by \$60,000.

Sample Test Questions

1. What factor of production is a tractor?
 - A land
 - B labor
 - C capital
 - D entrepreneurship
2. What is the alternative you face if you decide to do one thing rather than another called?
 - A tradeoff
 - B opportunity cost
 - C incentive
 - D variable cost
3. What is the degree to which resources are being used efficiently to produce goods and services called?
 - A specialization
 - B productivity
 - C division of labor
 - D consumption
4. What are the gifts of nature that make production possible?
 - A consumer goods
 - B human capital
 - C natural resources
 - D input
5. Which would not be considered as capital by an economist?
 - A a share of corporate stock issued by General Motors
 - B an automobile used by General Electric
 - C a crane used by a building contractor
 - D a razor used by a barber
6. Which would not be classified by economists as land?
 - A two thousand acres of virgin forest
 - B a hydroelectric dam
 - C crude oil reserves
 - D iron ore deposits
7. What is the term for the individual that brings together the other economic resources necessary for production?
 - A government units
 - B entrepreneurs
 - C corporate shareholders
 - D the managerial elite
8. The fundamental economic problem is that resources are finite, but economic wants are insatiable. What terms best describes this problem?
 - A trade-off
 - B productivity
 - C demand
 - D scarcity
9. Which factor of production include any form of human effort exerted in production?
 - A land
 - B labor
 - C capital
 - D entrepreneurship

Sample Test Questions- ANSWER KEY

1. What factor of production is a tractor?
 - A land
 - B labor
 - C capital**
 - D entrepreneurship
2. What is the alternative you face if you decide to do one thing rather than another called?
 - A tradeoff**
 - B opportunity cost
 - C incentive
 - D variable cost
3. What is the degree to which resources are being used efficiently to produce goods and services called?
 - A specialization
 - B productivity**
 - C division of labor
 - D consumption
4. What are the gifts of nature that make production possible?
 - A consumer goods
 - B human capital
 - C natural resources**
 - D input
5. Which would not be considered as capital by an economist?
 - A a share of corporate stock issued by General Motors**
 - B an automobile used by General Electric
 - C a crane used by a building contractor
 - D a razor used by a barber
6. Which would not be classified by economists as land?
 - A two thousand acres of virgin forest
 - B a hydroelectric dam**
 - C crude oil reserves
 - D iron ore deposits
7. What is the term for the individual that brings together the other economic resources necessary for production?
 - A government units
 - B entrepreneurs**
 - C corporate shareholders
 - D the managerial elite
8. The fundamental economic problem is that resources are finite, but economic wants are insatiable. What terms best describes this problem?
 - A trade-off
 - B productivity
 - C demand
 - D scarcity**
9. Which factor of production include any form of human effort exerted in production?
 - A land
 - B labor**
 - C capital
 - D entrepreneurship