12

Economic Standards 12.2.2. and 12.2.7.

Student Workbook

California Education and the Environment Initiative

Sustaining Economies and the Earth's Resources

California Education and the Environment Initiative

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The Education and the Environment Curriculum is a cooperative endeavor of the following entities:

California Environmental Protection Agency
California Natural Resources Agency
Office of the Secretary of Education
California State Board of Education
California Department of Education
California Integrated Waste Management Board

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Key Partners:

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Aquaculture: The farming of freshwater or marine plants, algae, fish, and shellfish.

Bycatch: The fish or other marine organisms that are not the target species for fishermen but are accidentally caught in nets.

Byproduct: Something, such as waste materials or chemicals, produced when something else is manufactured or consumed.

Commodity: Goods, such as grain, livestock, and minerals (including oil), that are bought and sold.

Competition: In ecology, the struggle between organisms for limited resources. In economics, individuals or groups striving for a greater share of the market to sell or buy goods and services.

Consumer: In ecology, an organism that obtains energy or matter from a natural system, such as by eating other organisms. In economics, one who uses goods or services produced by natural or human social systems.

Economic goods: Tangible materials, produced with labor and capital, which have a monetary value as products.

Economic impact: The effect of an event or factor on the economy, such as an economy-wide, macroeconomic effect on employment and income resulting from a decision, event, or policy.

Embargo: A law or policy prohibiting trade with another nation, or trade of a particular good.

Fishery: An ocean region where humans harvest or raise marine animals, such as fish and invertebrates. It is also used to refer to the processes of harvesting and raising marine animals.

Law of Demand: A principle that states the higher the price, the less consumer demand there will be for a good or service or, inversely, as the price of good or service decreases the consumer demand will increase.

Law of Supply: A principle that states that as the price of a good or service increases, producers will make greater amounts of the good available.

Moratorium: Suspension of an activity for a waiting period set by an authority.

Natural system: The interacting components, processes, and cycles within an environment, as well as the interactions among organisms and their environment.

Producer: In ecology, an organism (plant or alga) that converts light energy to chemical energy stored in carbohydrates. In economics, someone who cultivates or develops goods.

Quota: A limit set on the quantity of a good that can be harvested or extracted, or imported into a country.

Regulation: A specific rule created by a government agency or other legislative authority to implement and enforce laws and policies.

Scarcity: The condition wherein there is an insufficient supply or amount of something needed, such as goods or services.

Shortage: An insufficient supply of goods or services.

Stock: The supply of goods available for sale or held in reserve for future use.

Subsidy: Government funds given to support an enterprise that is considered beneficial to the public.

Substitution: The act of using one type of good in place of another, in order to satisfy the same need.

Surplus: An excess supply of goods or services.

Sustain: To support the continued existence of something.

Tariff: A tax on imported goods imposed by the domestic government.

Trade agreement: An agreement on conditions of commerce in goods and services.

Zoning: The designation of an area for a particular use.

Name: _____

Instructions: Use the terms in the Word Bank to complete the sentences below. (2 points each)

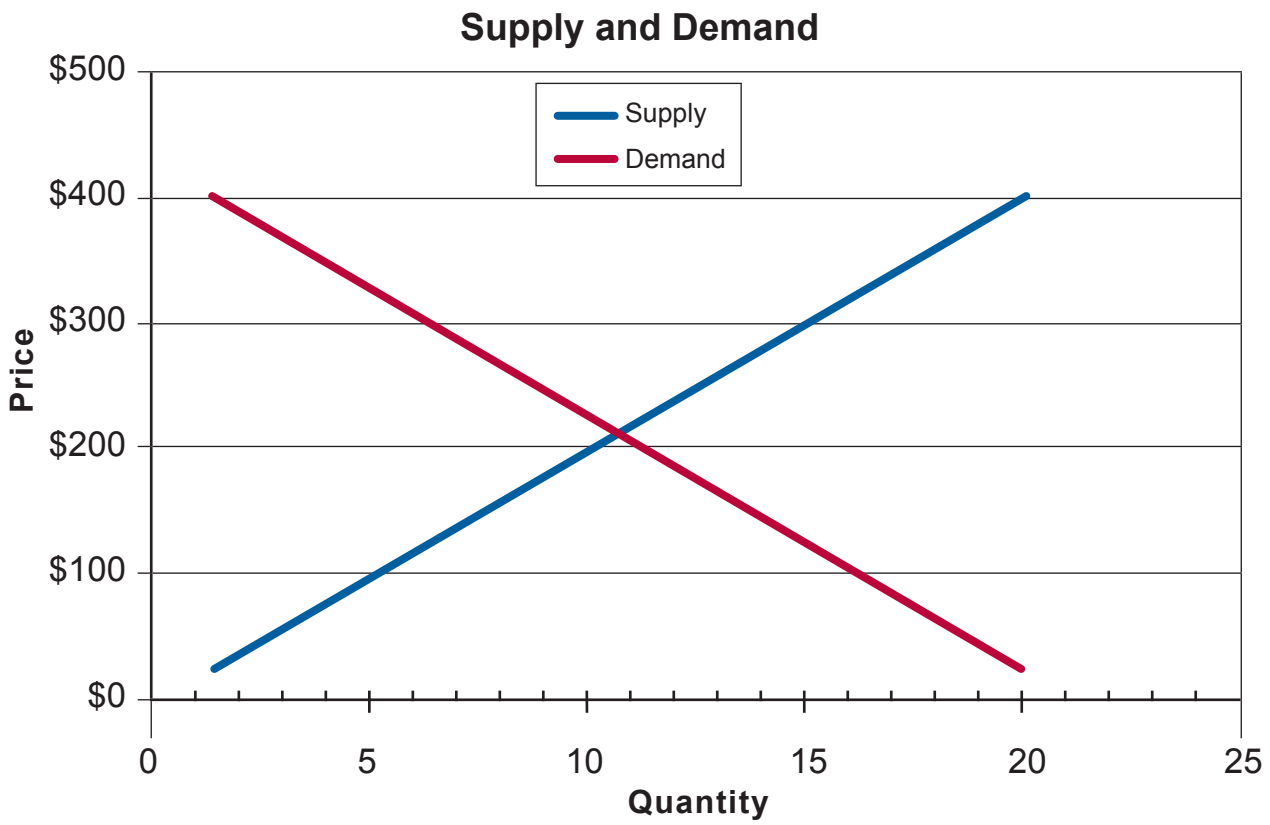
Word Bank

consumer	equilibrium	money	producer
demand	law of demand	market	scarcity
economic goods	law of supply	price	supply

1. When I want to buy more things than I have the money to pay for, I am experiencing _____.
2. _____ are materials that have a monetary value as products.
3. When I buy something, I act as a _____.
4. _____ refers to the amount of a good or service that is available.
5. _____ refers to the level of desire for a particular good at a given time and at a given price.
6. A _____ is someone who makes or cultivates goods that people buy or trade.
7. The monetary value of a good or service is called its _____.
8. According to the _____, as the price of a good increases, the supply will increase.
9. According to the _____, as the price of a good decreases, the demand for that good increases.

Name: _____

10. The intersection of supply and demand on the graph below is called the _____.

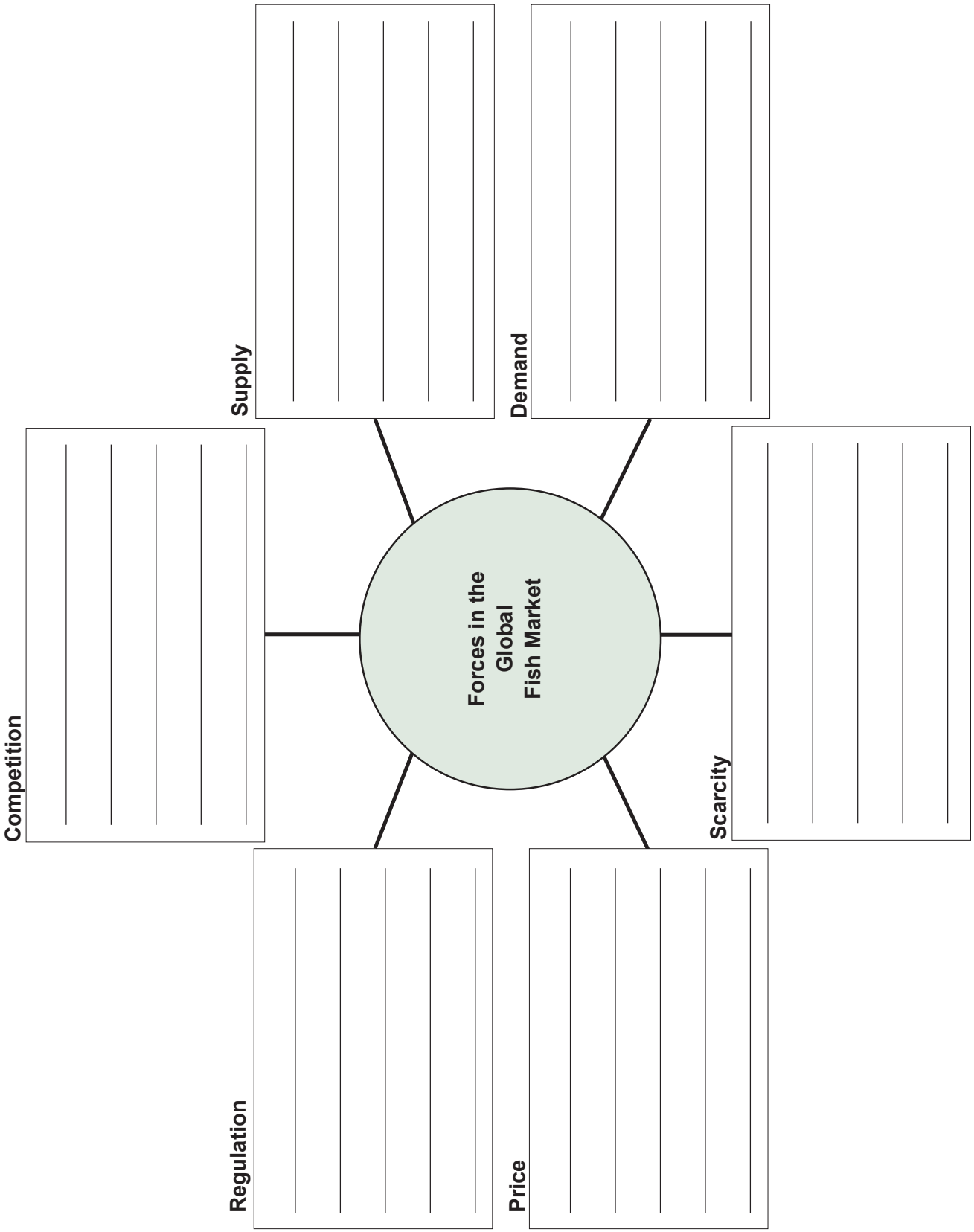


Name: _____

Instructions: Complete the diagram on the next page by answering the following questions in each section of the "cluster":

- **Competition:** Is there competition for fish? If so, why do you think so?
- **Supply:** Why is there a diminished supply of fish? What can result with a diminished supply?
- **Demand:** Is there a high demand for fish? (Explain the reason for your answer.) Who is demanding it?
- **Scarcity:** What is scarcity, and how does it apply to the fishing industry?
- **Price:** What role does price play in the supply and demand for fish?
- **Regulation:** What regulatory measures to manage the supply of fish did this article discuss?

Name: _____


Competition
Supply
Regulation
Forces in the Global Fish Market
Demand
Price
Scarcity

Name: _____

Instructions: Complete the chart below by describing the direct and indirect effects of the global fishing industry on natural systems (the ocean), and the economy. Provide three examples of each. (2 points per example, 12 points total)

Effects of the Fishing Industry on the Natural System (Ocean)	Effects of the Natural System (Ocean) on the Fishing Industry

Name: _____

Instructions: Answer the following questions using what you have learned from the example of the Atlantic cod and the cod fisheries. (5 points each)

1. If there is a worldwide increase in consumption of fish (demand), what happens to the stock (natural supply) of fish? Why?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

2. When populations of fish decline, what happens to the industry? To the price of fish? To the ocean ecosystem?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name: _____

Instructions: After reading about one of these "byproducts," share information about illegal fishing or aquaculture with your partner. After sharing what you have learned, work together to complete the "pros" and "cons" columns in the chart below.

t	Pros (+)	Cons (-)
Illegal Fishing (Piracy)		
Aquaculture (Fish Farming)		

Name: _____

Instructions: Use information from the lesson to answer the following questions. (4 points each)

1. What has led to illegal fishing and aquaculture?

_____

_____

_____

_____

2. Which fish populations are being threatened by illegal fishing but being sustained by aquaculture?

_____

_____

_____

_____

3. How does illegal fishing address the economic forces at work in the fishing industry?

_____

_____

_____

_____

_____

_____

4. How does aquaculture address the economic forces at work in the fishing industry?

_____

_____

_____

_____

_____

_____

Name: _____

Instructions: Complete the chart below with information about the regulatory measure your group has selected and information about the others shared with you by your classmates. (6 points each row)

Regulatory Measure	Definition	How Used in the Fishing Industry	Effect on the Market (supply, demand, price)
Embargo			
Moratorium			
Quota			
Subsidy			

Name: _____

Regulatory Measure	Definition	How Used in the Fishing Industry	Effect on the Market (supply, demand, price)
Tariff			
Trade Agreement			
Zoning			

Name: _____

Instructions: Use information from the lesson to answer the questions below. (10 points)

Do you think that governments should regulate the production and consumption of natural resources? Why or why not?

California's Marine Life Management (MLMA) Act of 1998
Excerpts from: Weber, Michael J. and Burr Heneman. 1998. *The Online Guide to California's Marine Life Management Act*. California Fish and Game Commission. Retrieved from: http://www.fgc.ca.gov/mlma/introduction.html

The federal agency with primary responsibility for the conservation and management of marine fisheries is the National Marine Fisheries Service, an agency of the National Oceanic and Atmospheric Administration in the U.S. Department of Commerce. The principal federal fisheries management law is the **Magnuson-Stevens Fishery Conservation and Management Act**, which was last amended by the **Sustainable Fisheries Act** of 1996. Like the MLMA in many ways, the **Magnuson-Stevens Act** calls for fishery management plans that meet certain standards, such as avoiding overfishing. In most cases, the federal fishery management process begins with the Pacific Fishery Management Council, or PFMC. The PFMC is composed of state and federal agency representatives as well as commercial and recreational fishermen from California, Oregon, Washington, and Idaho, and a representative of the Indian treaty tribes.

Fisheries within the 200-mile Exclusive Economic Zone (EEZ) may be managed under fishery management plans developed by the PFMC and approved by the Secretary of Commerce. In the absence of a federal fishery management plan, however, the state can manage fishing by vessels registered in California to the limit of the EEZ.

The **Salmon Management Plan**, which was first implemented in 1984, coordinates the management of fisheries, principally for chinook and coho salmon. The coastal pelagics fishery management plan concerns schooling species, such as, squid, anchovy, sardine, and pacific and jack mackerel. The PFMC is developing a fishery management plan for tunas, swordfish, marlins, sailfish, oceanic sharks, and other highly migratory species.

Together with Alaska, Idaho, Oregon, and Washington, California is also a member of the Pacific States Marine Fisheries Commission. The Commission, which was established by Congress in 1947, has no regulatory powers, but aims at promoting coordinated management of fisheries in state waters.

Several other federal laws concern the management of marine life off California. The National Marine Fisheries Service (NMFS) splits responsibility with the Interior Department's U.S. Fish and Wildlife Service for species under the Endangered Species Act and the Marine Mammal Protection Act. While the U.S. Fish and Wildlife Service holds responsibility for the conservation of southern sea otters and birds,

NMFS oversees the conservation of protected fish and shellfish, seals, sea lions, dolphins, and whales off California.

Several species of marine life have been listed under the Endangered Species Act of 1973. The **Endangered Species Act** prohibits "taking" an endangered species; taking means "to pursue, hunt, shoot, capture, collect, kill or attempt" to do so. Limited taking of an endangered species incidental to activities, such as fishing, may be permitted. These and other protections for endangered species do not apply to threatened species unless separate regulations are adopted. Under Section 7 of the Endangered Species Act, federal agencies must consult with NMFS or the U.S. Fish and Wildlife Service to insure that their actions do not jeopardize the continued existence of listed species.

The following species found along California's coast have been listed as endangered under the federal Endangered Species Act: humpback, blue, fin, sei, and sperm whales; leatherback, olive ridley, green, and hawksbill sea turtles; Sacramento winter-run chinook salmon; southern California steelhead; California brown pelican; and California least tern. Threatened species include Central Valley spring-run chinook, California coastal chinook, and Central and Northern California coho salmon; steelhead of the Central Valley and the south-central and northern California coasts; Guadalupe fur seals; loggerhead sea turtles; marbled murrelets; and snowy plovers.

The **Marine Mammal Protection Act (MMPA) of 1972** imposed a moratorium on "taking" marine mammals, with a few exceptions that include taking marine mammals incidental to commercial fishing. Under the MMPA, taking may include intentional or unintentional capture or harassment. Amendments to the MMPA adopted by Congress in 1994 established a new regime to govern incidental taking in commercial fishing. This program aims to reduce serious injury and mortality of marine mammals to insignificant levels approaching zero.

The regime divides fisheries into three categories, based on criteria, such as the frequency of marine mammal captures and the degree of threat that the capture poses to marine mammal populations. Vessels in Categories I or II must register with NMFS and may be required to carry an observer to collect information. A Take Reduction Team, composed of fishermen, scientists, and conservationists, was convened to suggest means of reducing the incidental catch of marine mammals in the swordfish drift gillnet fishery off California. In 1997, NMFS adopted regulations requiring that fishermen use pingers on their nets and hang their nets well below the surface in order to reduce the capture of several species of small whales as well as humpback and sperm whales in these nets.

One other federal wildlife law deserves mention: the **Migratory Bird Treaty Act.** Under this legislation, which implements several international treaties, migratory birds may not be captured or killed unless permitted by regulations adopted by the Secretary of the Interior. Seabirds, shorebirds, and other non-game birds fall under the protection of the Migratory Bird Treaty Act.

Finally, several federal laws apply to the conservation and use of coastal habitats and the prevention of water pollution, including the **Coastal Zone Management Act,** the **Clean Water Act,** and the **Ocean Dumping Act.** These laws are administered by other state and federal agencies, including the Environmental Protection Agency and the Army Corps of Engineers.

State Marine Life and Fisheries Management

The federal **Submerged Lands Act of 1953** authorizes the State of California to control and regulate the use of marine resources, including living marine resources, as well, as oil and gas and other minerals, in state waters within three miles of the shoreline. There are several exceptions to this general rule. For instance, under the Marine Mammal Protection Act and the Endangered Species Act, the federal government has pre-empted state authority in the conservation of marine mammals and endangered and threatened species in state waters.

California can regulate fishermen licensed in California wherever they fish. It can also regulate fishermen licensed in other states whenever they fish in California waters or land their catch in California ports. If vessels from other states fish beyond three miles offshore and do not call at a California port, the state cannot control their activities. Similarly, the states of Oregon and Washington do not have jurisdiction over California vessels that fish in waters more than three miles off their shores, for pink shrimp and Dungeness crab as examples, and land their catch in California. State regulations must be consistent with federal regulations, however, for species included in a federal fishery management plan. Generally, that means that state regulation may be stricter but not less restrictive than the federal requirements.

Within California state government, there are three principal "managers" of marine life and fisheries: the California Fish and Game Commission (Commission) and the California Department of Fish and Game (Department), both of which reside within the Resources Agency, and the Legislature. Before 1998, when the Legislature enacted the Marine Life Management Act, the authority of the Commission was restricted to managing sport fisheries, kelp harvesting, and some commercial fisheries; creating ecological reserves; and taking emergency actions. Management of other activities affecting marine life, including fisheries, has been carried out

through legislation. Two committees have principal jurisdiction over marine legislation in the Assembly: the Committee on Water, Parks, and Wildlife, and the Committee on Natural Resources. In the Senate, the Committee on Natural Resources and Wildlife has primary jurisdiction. The Senate and Assembly's Joint Committee on Fisheries and Aquaculture plays an important role as well. Most legislated measures concerning marine wildlife are assembled in the Fish and Game Code, while others may be found in other codes, such as the Public Resources Code.

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