

Student Sheet

Name: _____

Date: _____

List 5 fish and 5 other sea products that people eat.

Draw an aquarium tank with fish. Beneath it write the things that the fish needs to survive.



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Sort and Predict Words for Salmon in our lives

The words below are from the reading you are going to do to begin the unit on Salmon, the Environment and Society. In your groups, cut out each word from the list and sort them into three or four categories. Once you have put the words into categories, glue them on a separate piece of paper and name each group. Be prepared to explain why you put certain words together into a category. List three or four questions you want to have answered as you study this unit.

Estuary	Egg	First Nations
Pink	Sockeye	Redd
Salting	Omega 3	Coho
Culture	Alevin	Ocean
Fort Langley	Adult	Fry
Smolt	Stream	Hudson's Bay Company



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Activity 1 – Salmon in our lives

What fish is most important to British Columbia? For many people the answer is salmon. Wild salmon have lived in the waters of western Canada and the Pacific Northwest for thousands of years and have played an important role in the exploration and development of the province.

The Life of a Salmon

Salmon are anadromous, which means they are born in fresh water streams and rivers, migrate to the saltwater ocean where they live as adults, and then return to their stream or river of origin to spawn. There are five different species of Pacific salmon that are commercially fished, coho, sockeye, chinook, pink and chum, each with its own unique characteristics in life history, appearance, size, color and flesh characteristics. There are two other species, steelhead and cutthroat, that are also part of the Pacific salmon group, but they are not fished commercially.

Pacific Salmon begin their lives in fresh water. When spawning, a female salmon digs a nest or “redd” in the gravel bed of a stream and deposits thousands of tiny pink eggs. The male salmon then fertilizes the eggs. This spawning process occurs in hundreds of small rivers and streams throughout British Columbia. An embryo will develop within the fertilized eggs. The amount of time it remains an embryo depends on water temperature and salmon species. The eggs hatch after between two and four months into the alevin stage. Alevins are wholly dependent on their yolk sac for nourishment. Once the yolk sac and its nourishment have been absorbed the alevin become swim-up fry and must leave the gravel in search of new nourishment. They remain in the fry stage for 1-2 months, and then they are called juveniles.

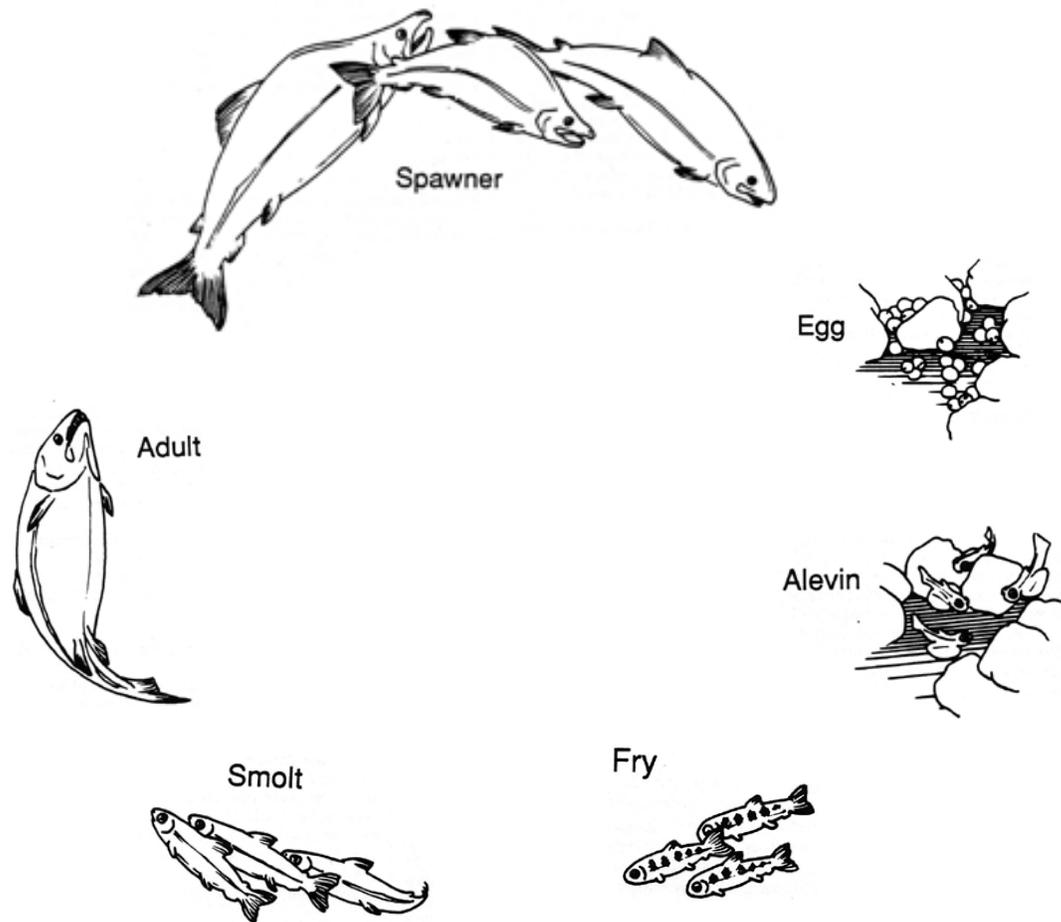
During their time in freshwater, which varies from species to species, the juveniles receive a series of cues, such as the smell and taste of the water, which assist them in returning to this same area later in their lives when they are ready to spawn. This process is called imprinting.

Anadromous Pacific salmon juveniles spend varying amounts of time in their freshwater streams and rivers. Sockeye spend the longest (1-3 years) while pink and chum spend the least time there (they head immediately for the ocean). Chinook stay in freshwater anywhere between three months to a year, while coho spend 1-2 years in freshwater.

For the next part of their lives, the salmon migrate to an estuary, the place where the river flows into the ocean. In the estuary, fresh water mixes with salt water (called brackish water) and the salmon begins to adapt to its new environment. When a salmon juvenile is adapted to living in saltwater, it is known as a smolt. They are soon ready to travel into the ocean for the next part of their lives.

Salmon will live in the ocean for 2 – 8 years, eventually growing into adults. When the time is right, an adult salmon will return to the mouth of the river where it was hatched. It's time to complete the salmon life cycle and spawn the next generation of salmon. As salmon begin their journey to their home stream, they stop eating and live mainly on the oils stored in their bodies. The distances they travel and their astounding return to the exact point where they emerged from their egg sacs is amazing. After spawning, adult salmon of most species will die within a few weeks, although steelhead, cutthroat, Atlantic salmon and brown trout can live to spawn a second time.

Student Sheet



Fisheries and Oceans Canada

Salmon and the First Nations People

Before the first European settlers arrived in British Columbia, it was said that some local rivers were so thick with countless salmon that First Nations People simply speared or clubbed them to death from their canoes or from the riverbanks. What salmon the coastal First Nations People didn't eat fresh, they would smoke or air-dry in river winds to create jerky for nourishment and ceremony throughout the year.

The First Nations people of the Pacific Coast look upon salmon with great reverence and have special rituals and legends for the yearly return of salmon to their spawning streams. They look upon the salmon as life, as the salmon have nourished them physically and spiritually since the days when their people first came to this region.

Salmon continues to play an important part of the culture of the First Nations People of the west coast of Canada.



Salmon and Early British Columbia

The economy of early British Columbia was built on the 3 “F’s” – forestry, fur trading and fishing. The abundance of salmon brought many people to BC. It’s understandable that commercial fishing for salmon began shortly after the arrival of Europeans on the West Coast. The Hudson’s Bay Company shipped salted salmon from Fort Langley to the Hawaiian Islands starting in 1835, and the first salmon cannery opened in 1876. When the Canadian Pacific Railway was completed in 1887 it was possible to more easily ship fresh, frozen and canned Salmon to markets in eastern Canada and the United States. By the turn of the century, 70 canneries were in operation. Since then, salmon fishing has remained an important part of the BC economy and a way of life for many communities.

Salmon and a Healthy Diet

The amount of food you require every day from the various food groups depends on your age, body size, activity level, and whether you are male or female. Canada’s Food Guide to Healthy Eating suggests 2 – 3 servings of fish, meat and alternatives each day.

The taste of salmon that people enjoy is created by their protein, oil and Omega-3 fatty acids. These ingredients provide numerous health benefits. Salmon protein is low in fat. The fat it does have is called Omega-3 fatty acid, which helps prevent heart disease and stroke by keeping arteries healthy. Research also shows that Omega-3 provides other health benefits in the prevention and treatment of cancer, arthritis and depression.

Check for Understanding

1. Define anadromous.
2. Create a diagram that shows the life cycle of the salmon. Indicate the parts of their life when they are in fresh water and the parts that are in salt water.
3. In what ways have the First Nations people used salmon?
4. List several reasons why salmon should be included in a healthy diet.

Reflections

1. Why do you think salmon are important in our daily lives?

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Activity 2 – Salmon population in BC

A line graph is a useful tool to help analyze data. The picture it creates lets you see trends that the data suggests. In this activity, you are going to graph salmon production, for both wild salmon and farmed salmon, in British Columbia and look for trends.

Materials

Graph paper

Ruler

Pencil

Procedure

1. Create a line graph from the data for Wild Salmon Production in British Columbia (1990 – 2003). Remember the steps in creating a line graph:
 - a. Draw the two axes, one vertically and one horizontally.
 - b. Label the axes. The horizontal axis contains the independent variable – in this case the years for each data point. The vertical axis contains the dependent variable – in this case the tonnes of salmon produced.
 - c. Create a scale for each axis so that you can enter all the data points. Make your graph as large as possible by spreading out the data on each axis. Remember to let each space stand for a consistent amount.
 - d. Make a title for your graph. The title should clearly state the purpose of the graph.
2. Enter the data below for Wild Salmon Production in British Columbia (1990 – 2003).
3. Connect the data points with a line connecting each point.
4. Repeat the activity, but this time graph the data for Farmed Salmon Production in British Columbia (1990 – 2003).

Investigation Questions

1. What trend does the graph of Wild Salmon Production in British Columbia suggest?
2. What trend does the graph of Farmed Salmon Production in British Columbia suggest?
3. Can you think of other reasons why the graphs have the shape they do? Research the topic of salmon populations in British Columbia. Be prepared to suggest other reasons for these trends.

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Extensions

1. Research and graph human population in the world from 1985 - 2003. What is the shape of this graph? Explain how the information on this graph relates to the previous graphs you created.
2. Research and graph salmon consumption in the world from 1985 - 2003. What is the shape of this graph? How does the information on this graph relate to the previous graphs you created.

Salmon Production in British Columbia (1985 – 2003)

Year	Wild Salmon Production (1000s tonnes)	Farmed Salmon Production (1000s tonnes)
1985	107.6	.1
1986	104.0	.4
1987	66.7	1.9
1988	87.5	6.6
1989	88.7	11.9
1990	96.4	15.5
1991	85.6	24.4
1992	66.5	19.8
1993	85.1	25.6
1994	65.0	23.7
1995	48.9	27.2
1996	34.0	27.8
1997	47.2	35.0
1998	30.3	42.2
1999	17.0	49.6
2000	18.9	49.4
2001	24.7	68.0
2002	33.3	84.2
2003	38.4	72.7



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Activity 3 – Salmon Farming in 2005

The world's population is increasing. In 1985 the world population stood at 4.9 billion people. By 2003, that number had increased by almost 30% to 6.3 billion. This increase in the number of people in the world has created an increased demand for food. Agricultural practices have changed in response to growing demand. The practices for raising poultry and cattle have also changed as the world looks for new ways to feed its population. Aquaculture is changing the way we obtain fish, shellfish and marine plants as well.

Currently in BC, three main species groups are raised in aquaculture environments: salmon and other finfish (i.e. - trout, black cod, sturgeon), shellfish (i.e. - clams, oysters, scallops) and marine plants (i.e. - kelp, algae). In 2003, the B.C. aquaculture sector produced 81,400 tones of fish and shellfish and generated \$272.2 million in value. The total wholesale value of the farmed seafood products generated \$341.1 million.

The History of Aquaculture and Salmon Farming

Humans have been tending useful aquatic plants and animals for thousands of years by raising and harvesting them in small ponds. However, in the last two decades aquaculture (aquatic agriculture) has become far more important globally, expanding and diversifying with new species and technologies - providing an ever-increasing amount of the fish, shellfish and marine plants that reach our dinner plates.

In an effort to enhance the wild salmon populations, salmon hatcheries were created to take salmon from the egg to the fry stage before they were released into rivers and stream. These hatchery techniques provided the basis for early attempts at salmon farming. Early experiments involved raising hatchery fish in ocean net pens. Although they encountered problems, these early attempts at salmon farming proved that it was possible to raise salmon for human consumption. Over the next 30 years, techniques were improved and larger-scale commercial salmon farms emerged. Aquaculture practices and productivity are greatly improved today compared to 30 years ago.

Salmon farming did not originate in British Columbia. Norway and Scotland were the first countries to establish commercial salmon farming industries. In particular, salmon farming grew rapidly in importance in Norway, both as a way to supply fresh fish and as an economic power. Although small-scale salmon farming began in BC in the early 1970's, it expanded markedly in the early 1980's, when the BC government encouraged Norwegian investment in the development of salmon farming here, laying the groundwork for today's salmon farming industry. Those first larger scale salmon farms in BC were in the waters north of Vancouver, around Sechelt Inlet, Jarvis Inlet and Hardy Island.

In 1995 a two-year comprehensive study of the salmon aquaculture industry was undertaken. In the Salmon Aquaculture Review, the British Columbia Environmental Assessment Office recommended proceeding with salmon farms, but with caution. In 1997, a moratorium was imposed, capping the number of salmon farm licenses in British Columbia. In 2002, the BC government moved slowly to allow salmon farms to expand, but only with stringent environmental controls including tightened escape regulations and improved waste-discharge standards.

The salmon-farming industry has progressed rapidly in many regions of the world. On a global basis more salmon are grown in salmon farms than are caught in the wild fisheries. Canada is the fourth largest producer of farmed salmon in the world, and BC is responsible for about two-thirds of Canadian production. However, BC's production is dwarfed by that of the top three producers - Norway, Chile, and the United Kingdom - which together account for 85% of a total global production of farmed salmon.

Due to recent mergers, there are currently 5 companies (2006) that raise most of the farmed salmon in British Columbia. There are approximately 135 salmon farms located mainly in Clayoquot Sound on the west coast of Vancouver Island, northeast of Campbell River and in an area northeast of Vancouver Island called the Broughton Archipelago.

How Salmon Are Raised

Raising salmon is not much different than raising other animals. You start with babies and raise them until they are adults. In salmon aquaculture, salmon are hatched and raised to the smolt size in fish hatcheries, then transferred to offshore net-pens (underwater cages) where they are fed for about 20 months, until they grow large enough to be harvested, about 3 to 8 kg, depending on salmon species and market demand.

The most common type of farm for salmon aquaculture uses rectangular or circular net-pens. A net-pen is an underwater net enclosure supported by floating frames made of plastic, steel or aluminum. The net-pens are anchored to the ocean floor to keep the tides and currents from moving them. The net enclosure allows ocean water to flow through the net-pens while keeping salmon in and predators out. Several times a day, special food pellets are scattered over the surface of the pens. The food pellet shape slows its fall through the water making the pellets easier for the salmon to eat. Video cameras below the pen monitor feeding behavior and help ensure the salmon are not over fed. As the salmon excrete waste, the waste falls through the net to the ocean floor where it is dispersed by currents and decomposed by bacteria.

Salmon farms are usually located in sheltered ocean bays and coves that offer protection from storms, while providing water circulation using tides or currents to flush the area below the net-pens. This flushing removes uneaten food and waste from below the net-pens and provides a fresh supply of oxygenated seawater to the salmon.

Farmed salmon can be harvested throughout the year. This leads to a steady, year-round supply of fresh salmon. This is different from wild salmon, which are mainly caught when the salmon return to the coastal regions before spawning and which provides only a few months of fresh salmon. Wild salmon must be frozen or canned for use during the rest of the year.



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When salmon farming began in BC during the early 1970's, four species of Pacific salmon were raised: Chinook, coho, steelhead and sockeye. A number of problems raising steelhead, sockeye and coho salmon arose, including poor prices, slow growth and low survival rates. At the same time, Atlantic salmon were being raised in Washington State with higher survival rates and a stronger international sales market. BC salmon farmers switched species and began raising Atlantic salmon in the mid-1980s. Atlantic salmon account for most of BC's production. The rest is almost entirely chinook salmon production.

Check for Understanding

1. What three main species groups are raised in aquaculture environments in British Columbia?
2. What is aquaculture?
3. Summarize how a salmon farm works. Where are they usually located in British Columbia?
4. What country is credited with the first commercial salmon farms? What is their link to BC?
5. What is the main species of salmon raised in BC? What are the main advantages to raising this species?

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Extensions

1. One common size of net-pen is 30 m-by-30 m-by-15 m deep.
 - a. What is the volume of water in this net-pen?
 - b. How many of your classrooms could fit in the net-pen?
 - c. A fish farm will have a density of Atlantic salmon in the water of 16 kg/m³ in the net-pens. If each salmon has a mass of 5 kg, how many salmon would you expect to find in a net-pen this size?
2. Does the increase world population relate to the creation of salmon farms and their increase in number during the past three decades? Explain.



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Activity 4 – You Are What You Eat

In the past, primitive humans relied on gathering plants and killing wild animals for food, clothing, and shelter. Their survival depended on their knowledge of where plants were found and the behavior of animals. Later, more organized agrarian societies relied less on an individual's knowledge. This specialized knowledge was mainly important to farmers, ranchers, and fishers. Now, most of us are only concerned that we have an adequate supply of food at a reasonable price. We often don't think of where our food comes from.

The supply of food depends on three factors;

1. How much food has been produced by various types of agriculture;
2. How much food has been consumed; and
3. How much food has been preserved with safe processing and storage.

The most important agricultural products for the world's supply are cereal grains (i.e. – wheat, corn), pulse grains (i.e. – beans, soybeans), and to a lesser extent livestock (i.e. – pigs, chickens, cattle). Various types of fish (i.e. – salmon, tuna, cod) also play a role in the world's food supply.

An increasing population has put a greater demand on Canada to produce food, not only for our country but also for export to other countries. As the demand for food has increased, agricultural techniques have changed to meet the demand.

Changing Farm Practices

In order to grow more cereal and pulse grains, farmers have changed their farming practices. They need to grow more food per acre of land. To do this, they use genetic manipulation to produce seeds for plants that grow faster, produce more nutritious seeds, and fruits and are more resistant to drought, insects and disease. Farmers use fertilizer to supply and replace missing soil nutrients and to increase crop yields. They also use large machines to increase the amount of food that can be produced by each worker. Another method to grow plants (i.e. – tomatoes, peppers, cucumbers) is hydroponics, a gardening method in which plants are grown in a greenhouse without soil. Plants are instead grown in a chemical nutrient solution.

These farming practices have risks, which concern many people. Excess fertilizer can run off into streams, fewer people are employed in a mechanized farm industry, and some question the use of genetically modified seeds.

Changing Ranch Practices

Demand for more protein has also changed the way ranchers raise pigs, chickens, and cattle. Factory farming, or confinement rearing, is a method of raising large numbers of animals in a relatively small area under conditions that ensure rapid growth. Confinement rearing includes bringing food to the animals, often through computerization and automation, rather than having them forage. This lets ranchers attain the most efficient ratio of growth-time to feed costs. The use of selective breeding also ensures that animals will grow faster and produce more meat protein. Diseases are controlled through the use of medicines and vaccines. In general, factory farming using confinement methods produces meat, milk, or eggs in less time and at lower costs than is possible with conventional animal raising practices. Examples of factory farming are chicken houses that hold thousands of chickens, or farms that house large numbers of cows or pigs in confined pens and cattle feedlots.

These farming practices also have risks, which concern people. Confining animals in a small space concentrates their waste, automation means that fewer people are employed, and some question the use of selective breeding as it decreases the size of the gene pool for that species.

Changing Fish Practices

Initially, fish were caught in their native environment with hooks, spears and nets. Using these methods, fishing boats were able to catch a steady supply of fish for decades. However, over-fishing, habitat destruction, man-made obstructions (i.e. - dams, canals), and pollution have greatly decreased the number of fish caught each year. At the same time, market demand has expanded for fresh fish throughout the year.

This decrease in available fish, coupled with increased market demand for fresh fish has led to an increase in the amount of aquatic products, that are raised using aquaculture techniques. Similar to other intensive farming techniques, salmon farms raise large numbers of fish in a confined space. Salmon farms monitor dissolved oxygen and other environmental factors and control diet, and growth rates to maximize fish protein for processing.

Like other farming practices, salmon farming has risks. These include salmon diseases and parasites, salmon escapes and breeding between wild and farmed fish of the same species, excess food and waste below net-pens, competition with wild salmon, chemical concentrations, and First Nations opposition.



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The chart below summarizes some of these concerns,

Farmed Salmon Concerns	Farmed Salmon Answers to Concerns
Confinement rearing leads to diseases and parasites, which can spread to wild salmon stocks in the area.	These diseases and parasites were a concern before salmon farms started and have not increase beyond earlier levels.
Atlantic salmon can escape confinement and breed with Pacific salmon.	Although some Atlantic salmon escape their net-pens, there is scientific evidence that Atlantic salmon cannot breed with Pacific salmon. : Also, no record of Atlantics developing feral populations outside their natural range
Excess food and waste builds up below net-pens which affects not only the farmed salmon but also other marine organisms in the area.	Improved techniques reduce excess food build up. Proper site location ensures regular flushing removes waste. Wait time between harvest and re-introduction of next fish stock supply allows marine environment to recover.
Farmed salmon require 2 to 5 kg of food (fishmeal and other proteins often made from other wild fish) to produce 1 kg of protein mass in farmed salmon.	It takes 12 to 15 kg of food (other fish) to produce 1 kg of protein mass in wild salmon. Also, requirement for fishmeal continually decreases with supplementation using plant based proteins such as legumes.
Farmed salmon cost less than wild salmon and keeps prices lower during wild salmon harvest times depriving wild fishers of income.	Wild salmon are paid a premium price and are moving into a specialty market. Increased salmon from salmon farms will decrease the need for wild salmon and allow wild salmon stocks to recover to their previous numbers
There is evidence that farmed salmon are not as safe to eat as wild salmon. They contain higher levels of some chemicals, such as dioxins and PCBs, which may make them a health risk.	While the level of some chemicals is higher in farmed salmon, the levels are insignificant and should not be a concern if salmon is eaten as part of a healthy diet. The levels of chemicals in farmed salmon can be controlled through their feed.
Some First Nations People object to salmon farms in their traditional coastal waters.	Some First Nations People support salmon farming along their traditional coastal waters.

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Although some people question some or all of these agricultural practices, it is important to remember that it is the demand for more and more agricultural products that created the need for these practices. The amount of land available to farm and raise animals is limited, not only in British Columbia, but all around the world. Declining wild fish stocks have created a need for farmed fish. To raise more food, at a reasonable cost, requires techniques such as the ones you have read about.

Check for Understanding

1. Why have agricultural practices changed over the years?
2. What agricultural practices have increased the amount of food that farmers, ranchers, and fishers can produce?
3. What are the positive effects of the new agricultural practices?
4. What are the negative effects of the new agricultural practices?
5. What alternatives could be used to replace the new agricultural practices?

Extensions

1. Write an editorial for the local newspaper either for or against one of the new agricultural practices.
2. Research the amount of land (or water) necessary to raise 1 kg of each of the following using the new agricultural practices: beef, poultry, and salmon. Which provides the most food protein for the world's population?



Name: _____

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Creative Endings

1. At a Sunday dinner, a friend says that a company should be able to conduct their business as long as they can make a profit and follow all laws and regulations. Beyond that, they should be left alone to do their job.
 - a. What do you think of that attitude? Explain your view.
 - b. If you disagree, what would you say to your friend to try to change his or her mind?

2. Frank and Zoe live on the west coast of Vancouver Island. The government is considering giving a local company a license to open a salmon farm in the waters in a bay near their town. Frank's family owns a fishing boat and is against the farm. Zoe's family owns the grocery store in town and thinks the salmon farm is a good idea. Frank and Zoe talk about the issue at lunch.
 - a. Why do you think Frank's family is against the salmon farm? What points do you think Frank would use in his side of the talk?
 - b. Why do you think Zoe's family is for the salmon farm? What point do you think Zoe would use in her side of the talk?
 - c. Do you personally agree with Frank or Zoe? Explain your answer.

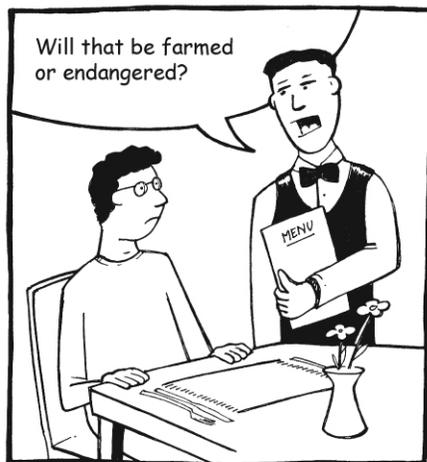
3. Lizzy lives on Vancouver Island. Her cousin Dan lives in Abbotsford. Their families get-together in the summer for a family vacation. While lying in the sun, their conversation moves to the environment. Dan is concerned about the salmon farms in British Columbia while Lizzy thinks there are other more important issues.
 - a. Why do you think Dan is concerned about salmon farms?
 - b. Why do you think Lizzy doesn't see salmon farms as a problem?
 - c. Do you agree with Lizzy or Dan? Explain your point of view.
 - d. Do you think there are more important issues than salmon farming? If yes, explain what you think is more important and why.

4. Raman's father had a mild heart attack. His doctor told him to get more exercise and to eat a healthy diet, including more fresh fish with Omega-3 fats, if he wants to decrease the chances of having more health problems.
 - a. What role does salmon play in Raman's father's recovery?
 - b. What alternatives would he have if salmon weren't available from salmon farms?
 - c. If you were Raman, what do you think your point of view would be concerning salmon farms?



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5. Eddie and John are talking about what a “wild salmon” actually are. Eddie thinks it means the fish is caught either in the ocean or in a river. John says that many salmon caught in the ocean or the river is enhanced, these salmon begin their lives in a hatchery and are released later. They are not really wild.
- How do you think the term “wild salmon” should be used? What salmon are wild?
 - Enhanced salmon have a lower imprinting rate, so fewer return to their birth streams and rivers to spawn. What problems do hatchery fish have on salmon populations in British Columbia?
 - What do you think are the benefits and risks of enhancing wild salmon through the use of hatcheries?
6. The two political cartoons below were printed in different local newspapers.



© Northern Agriculture



© Western Wilderness Committee

- What message do you think is implied by the first cartoon?
- What message do you think is implied by the second cartoon?
- How does the media, including political cartoons, affect the public's understanding of important issues such as salmon farming?
- Can you give another example of how the media affects the public's understanding of an issue? What role should the media play?





Salmon, the Environment and Society Word Search

There have been many words that you have encountered in your study of Salmon, the Environment and Society. How many can you find in the Word Search Puzzle below? Words can be spelled forwards or backwards, horizontally or vertically. You can find the words on this page and scattered through the pages of the Salmon, the Environment and Society module. Do you know what each word means?

A	T	L	A	N	T	I	C	F	L	U	S	H	I	N	G
W	E	R	E	D	D	N	O	B	R	O	D	D	L	I	W
N	N	S	C	L	H	T	H	A	T	C	H	E	R	Y	E
E	I	C	H	I	N	O	O	K	E	R	T	F	R	Y	S
T	E	E	U	Z	N	M	O	P	P	E	T	R	W	M	M
P	T	L	M	G	G	E	S	T	U	A	R	Y	Z	O	O
E	O	F	Y	X	R	G	T	Y	J	M	A	T	T	N	L
N	R	O	K	N	F	A	R	M	E	D	G	C	K	O	T
A	P	P	L	I	E	D	X	A	L	E	V	I	N	C	J
S	F	I	R	S	T	N	A	T	I	O	N	S	I	E	M
A	X	H	U	D	S	O	N	S	B	A	Y	X	P	Q	B
E	Y	E	K	C	O	S	J	W	P	E	L	L	E	T	M
S	U	R	A	Q	U	A	C	U	L	T	U	R	E	Y	O

Sockeye
Chum
Pink
Chinook
Coho
Atlantic

Egg
Fry
Alevin
Smolt
Omega
First Nations

Net pen
Protein
Hatchery
Pellet
Redd
Hudson's Bay

Farmed
Wild
Flushing
Estuary
Economy
Aquaculture

