BRING BACK THE SALMON
LAKE ONTARIO
supported by
ONTARIO POWER GENERATION

CLASSROOM HATCHERY PROGRAM

GRADE 1-6 LESSON GUIDE

For Students Learning at Home

Made Possible Through Funding From:

Ontario Trillium Foundation

Fondation Trillium de l'Ontario

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The following lesson plans have been selected out of a larger collection of lesson plans created by and for the Lake Ontario Atlantic Salmon Restoration Program's Classroom Hatchery Program. Their selection was made based on the rationale that they could be completed by students at home either individually or with family members. Each lesson is linked to the Ontario Curriculum for the grade indicated.

Lesson Summaries

Lesson 1: Grade 1 **Build an Atlantic Salmon**	Students will be introduced to basic fish biology and identification to assist them to identify an adult Atlantic Salmon. They will then build an Atlantic Salmon from diagrams of parts of the fish and add dots to reflect the key characteristics of the fish.	50–60 Minutes
Lesson 2: Grade 1 **Life Cycle Bracelet**	Students will learn about the Atlantic Salmon's Life Cycle and then illustrate the life cycle in the creation of a bracelet.	2 Hours
Lesson 3: Grade 2 **Life Cycle Diagram**	Students will learn about the life cycle of Atlantic salmon; labeling a diagram as they watch a video.	30–60 Minutes
Lesson 4: Grade 2 **Draw an Atlantic Salmon**	Students will be introduced to basic fish biology and identification to assist them to identify an adult Atlantic Salmon. They will then draw an Atlantic Salmon from an instruction sheet; paying attention to key identifying features.	50–60 Minutes
Lesson 5: Grade 3 **Identifying Atlantic Salmon**	Students will be introduced to basic fish biology and identification to assist them to identify an adult Atlantic Salmon. In groups of 2-3 they will use a basic characteristic key to identify and label a diagram containing 5 species of salmon found in Lake Ontario.	50–60 Minutes
Lesson 6: Grade 3 **Fish Need Trees**	Students will learn how Atlantic Salmon depend on trees and shrubs for their survival. The students will also learn about environmental stewardship and how they can be involved in improving ecosystem health; benefiting all of nature including Atlantic salmon and humans. Students will write a letter to enquire about undertaking a stewardship project.	120 Minutes
Lesson 7: Grade 4 **Stream Habitat Mural**	Create a habitat mural showing how the sun and the plants helps help an aquatic habitat be health and supports the food web of animals that live in a stream habitat, including the Atlantic salmon. As a whole class, the students will create a decorative backdrop that can be attached to the outside of the insulating foam of the Atlantic salmon classroom aquarium.	50–60 Minutes
Lesson 8: Grade 4 **Stream Habitat Dioramas**	Through an interactive hands-on activity, students create their own stream diorama's that show the key elements of a healthy stream. Students will learn of the importance of Atlantic salmon in a variety cultures including their own and the Haida through the read aloud activity of the Haida legend *Salmon Boy* as well as become familiar with vocabulary that will be used throughout this unit of study.	70 Minutes

Lesson 9: Grade 4 **Eroding Homes**	Students will conduct simple investigations to collect data on erosion rates of different Earth materials (waves, wind, water, glaciers). Students will be able to recognize that waves, wind, water and glaciers all break rock and soil into smaller particles and move them around and rank their investigations to evaluate the most efficient agent of erosion.	60–70 Minutes
Lesson 10: Grade 4 **Salmon Migration**	Through a hands-on mathematical board game students will describe the seasonal migration of anadromous fish, like the Atlantic salmon. They will identify a variety of natural and human factors that affect the reproductive success of Atlantic salmon and apply mathematical skill to biological problems.	50 Minutes
Lesson 11: Grade 5 **Meet the Atlantic Salmon**	Students will be introduced to basic fish biology and identification to assist them to identify an adult Atlantic Salmon. They will then label the fins of an Atlantic Salmon diagram. Next the students will compare major organs of humans and Atlantic salmon.	50–60 Minutes
Lesson 12: Grade 5 **A Day in the Life of an Atlantic Salmon**	Using their imagination students will write a short story about a day in the life of an Atlantic salmon having chosen a stage of its life cycle.	60–120 Minutes
Lesson 13: Grade 6 **Biodiversity Stations**	These biodiversity stations will hook students into learning the concept of biodiversity, what it means and how it plays a role within our ecosystem and the animals that surround them.	45 Minutes
Lesson 14: Grade 6 **Hanging Atlantic Salmon Habitats**	Students will be able to identify the components of a habitat that are essential for the Atlantic salmon to survive. After learning of the habitat requirements of a healthy habitat for an Atlantic salmon, students will create a habitat mobile that contains both specific habitat elements and key features to be included in Atlantic salmon habitat.	60 Minutes
Lesson 15: Grade 6 **Atlantic Salmon Life Cycle Puzzle and Mobile**	Through a hands-on activity, partners or groups of 3 will learn about the different stages of the life cycle of the Atlantic salmon and try to place the stages in the correct order through a puzzle activity. Following the ordering activity, students will create a visual representation of the life cycle that displays the life cycle of the Atlantic salmon as well as create a concrete example that can be displayed in the class demonstrating their learning and understanding.	45 Minutes

Grade 1 Classroom Hatchery Activities

Lesson 1: Build an Atlantic Salmon

Lesson Objectives:

- Familiarize students with the identification of Atlantic Salmon;
- Familiarize students with basic fish biology, identification, and terminology;
- Assist students in recognizing the value of proper species identification.

Materials:

- Projector connected to computer or printed presentation (found below);
- Handout containing Atlantic Salmon pieces (found below - print enough for 1 student each);
- Scissors;
- Craft glue;
- Construction paper of various colours;
- Pencil crayons, markers, or crayons.

Background

Ontario is home to nearly 150 fish species; 129 of which are native. Proper identification of individual species is useful for monitoring (species presence and location, population size, fish health…), and for managing and complying with fishing regulations. Identification can also help build a deeper connection with a species enabling the observation of patterns and life stories. It can also be a lot of fun!

Fish just like all other living things have unique physical characteristics that distinguish one species from another. Size, colouration, shape, and presence or absence of particular features are some of these characteristics. Atlantic Salmon like other salmon have an adipose fin (the small fin on the back of fish just ahead of tail) and a soft dorsal fin. The Atlantic Salmon has dark spots (sometimes x shaped) on a lighter coloured body, only 2-3 large spots on the gill cover, a mouth that stops at the eye and a long narrow caudal peduncle (the part of the fish just forward of the tail). These characteristics are shown in the presentation below.

It is important that scientists and anglers can properly identify Atlantic Salmon to give the Atlantic Salmon the best level of care and so that anglers can follow fishing regulations. Anglers with proper identification skills can be valuable citizen scientists who can greatly contribute to monitoring efforts.

Teaching and Learning Sequence

Part A. Share this Cool Atlantic Salmon **Fact:** *Atlantic Salmon are known as the "Leaper". They can jump out of the water 3 metres high! That is as high as a basketball net!!*

Part B. Ask these Guiding Questions
1. Has anyone ever seen an Atlantic Salmon?
2. How might you tell the difference between an Atlantic Salmon and another fish?"

Part C. Present **"Basic Fish ID"** (on a projector screen or print/display to class).

1. Page 1 of Presentation: Allow time for the students to talk about what they see. You are not looking for specific answers; rather engaging their observation skills.
2. Ask the students how a fish breathes? Point out and define the ***gills*** = *The breathing organ of fish and some other animals used to extract oxygen from water.*
3. Page 2- 4: Show the 1 or 2 characteristics identified on each fish. This can be done quickly and is intended to show the students some of the main physical differences between fish. Atlantic Salmon being our focal fish has more characteristics identified.
4. Page 5 shows the fins of the Atlantic Salmon. The presence of these fins are characteristic of all the salmon species. Point out and define the ***adipose fin*** = *A small fleshy fin just ahead of the tail. Found on only a small number of fish species including salmon*.
5. Supply students with "**Build an Atlantic Salmon (handout)**"; construction paper; scissors; glue; crayons/markers/paint supplies/pencil crayons.
6. Have the students create a background for their fish. This can be just blue water or water with the sky above. Make sure that they leave enough water for their Atlantic Salmon cut out.
7. Displaying "**Build an Atlantic Salmon":** have the students cut out the pieces of the Atlantic Salmon and glue them in numbered sequence as close to the completed fish diagram as possible, i.e. the mouth does not extend past the eye (a key characteristic of Atlantic Salmon).

The names of the parts are: 1. Body; 2. Head; 3. Tail; 4. Dorsal Fin; 5. Anal Fin; 6. Pelvic Fin; 7. Pectoral Fin; 8. Eye; 9. Adipose Fin.

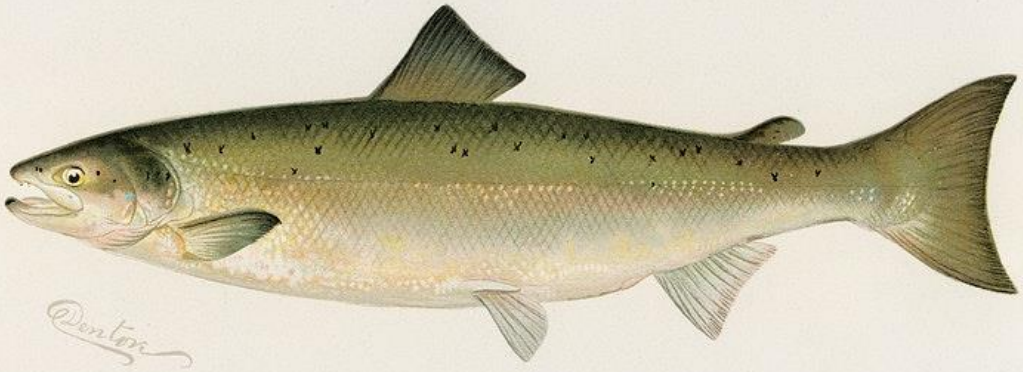
8. The students can now colour the fish and add the black spots. Instruct them that another key characteristic is 2-3 dots on the gill cover (the crescent shape on the head), few or no dots on the tail and few dots on the lower part of the body. The distribution of the dots on the rest of the body is distinctive of individuals. For an Atlantic Salmon in a lake the colour of the back can be brown, blue, or green; the sides are silvery and the belly is white. When the fish leaves the lake to enter streams to spawn they lose their silvery colour, become darker and may develop red spots. Students can also name their fish and use this name for the fish they release in the spring!

Part D. Ask these Reflection Questions (can be done as a Think, Pair, Share)
1. Why is the proper identification of fish important?
2. Name some identifying characteristics of an adult Atlantic Salmon.

Presentation: Basic Fish Identification

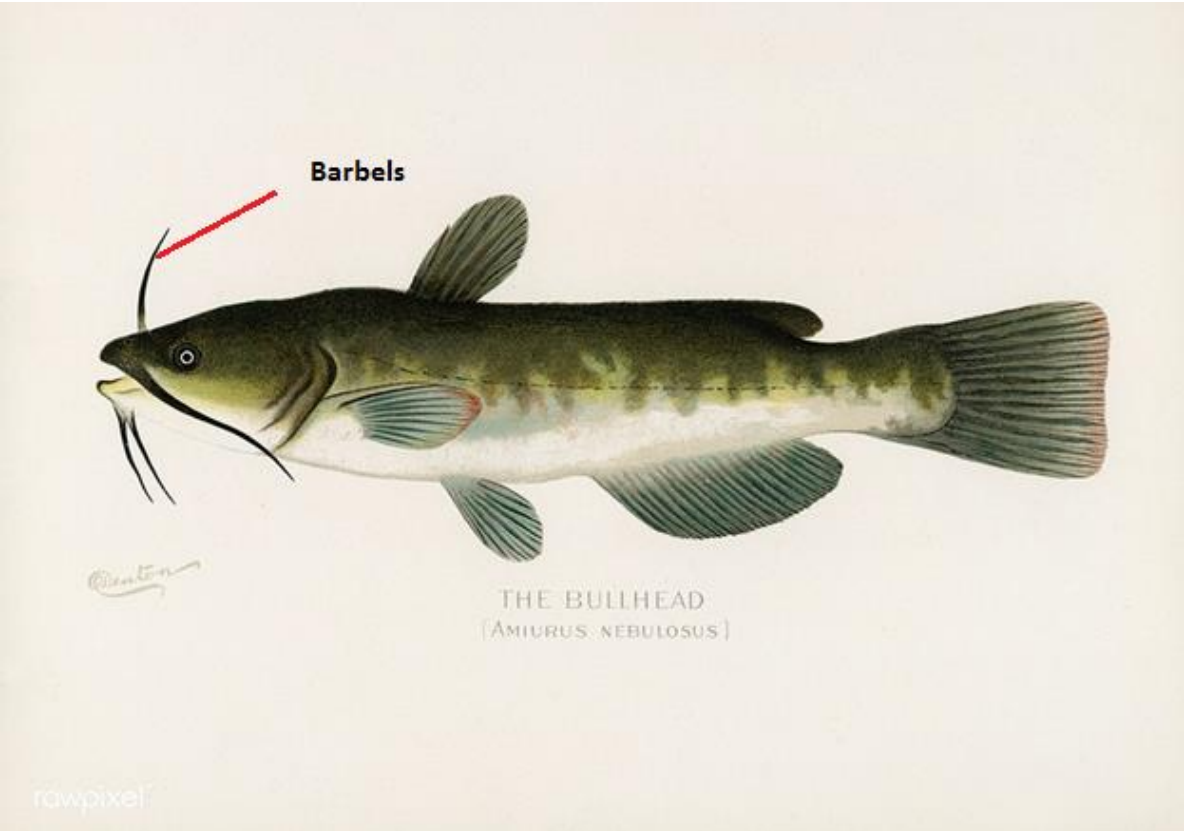
What differences do you see?

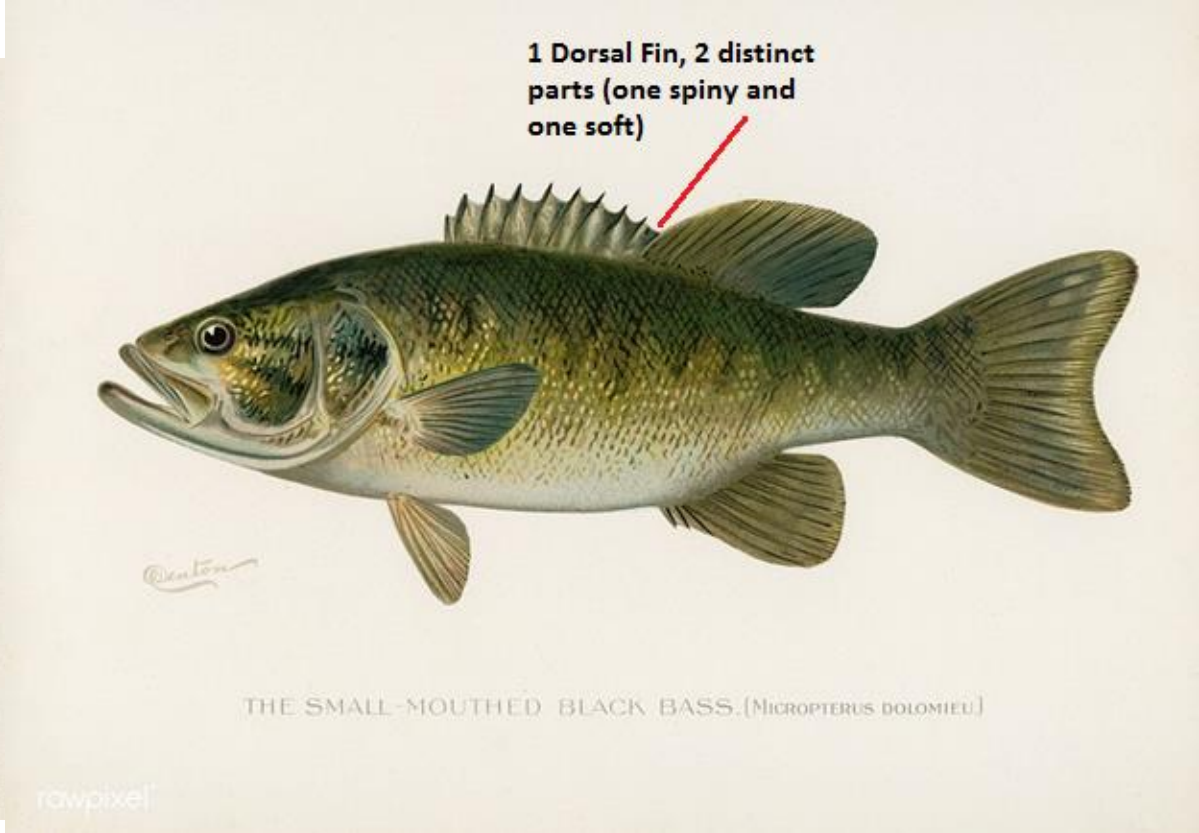
THE SMALL-MOUTHED BLACK BASS. (MICROPTERUS DOLOMIEU.)

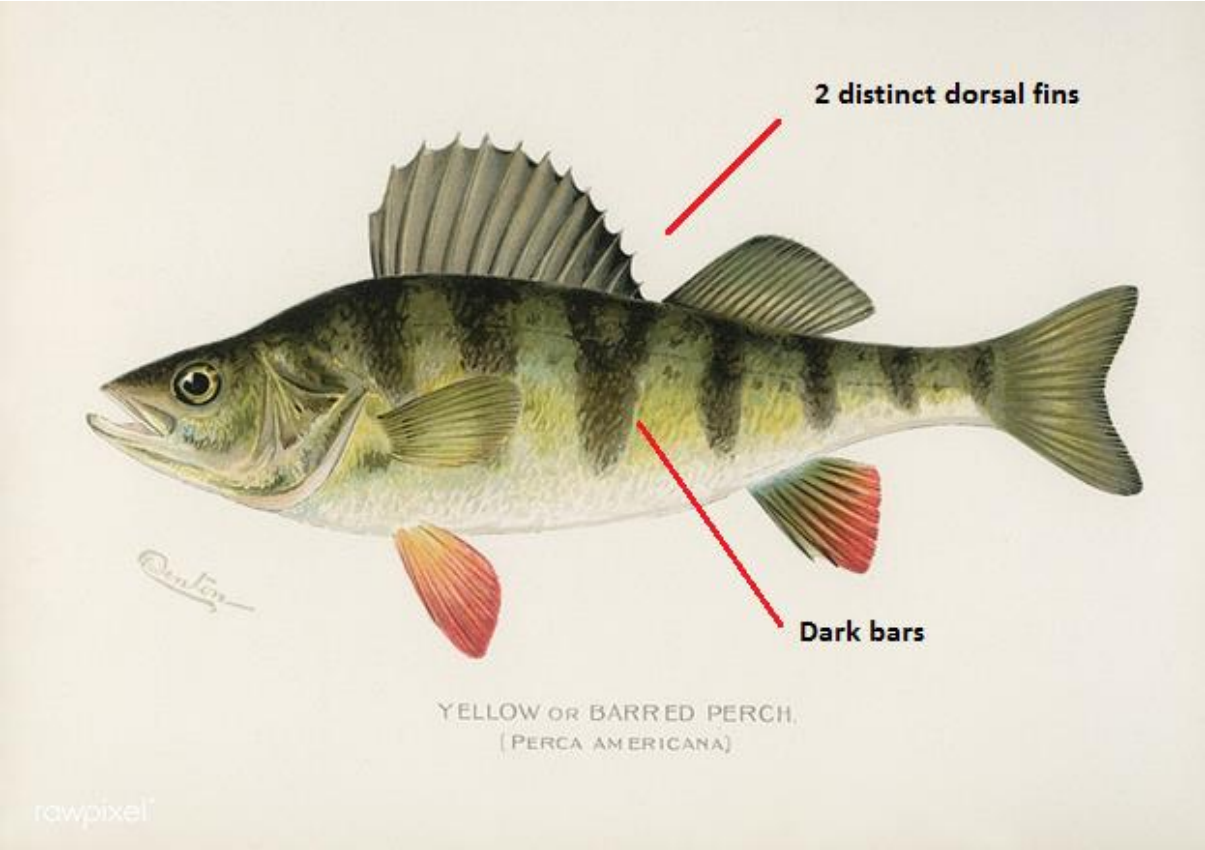


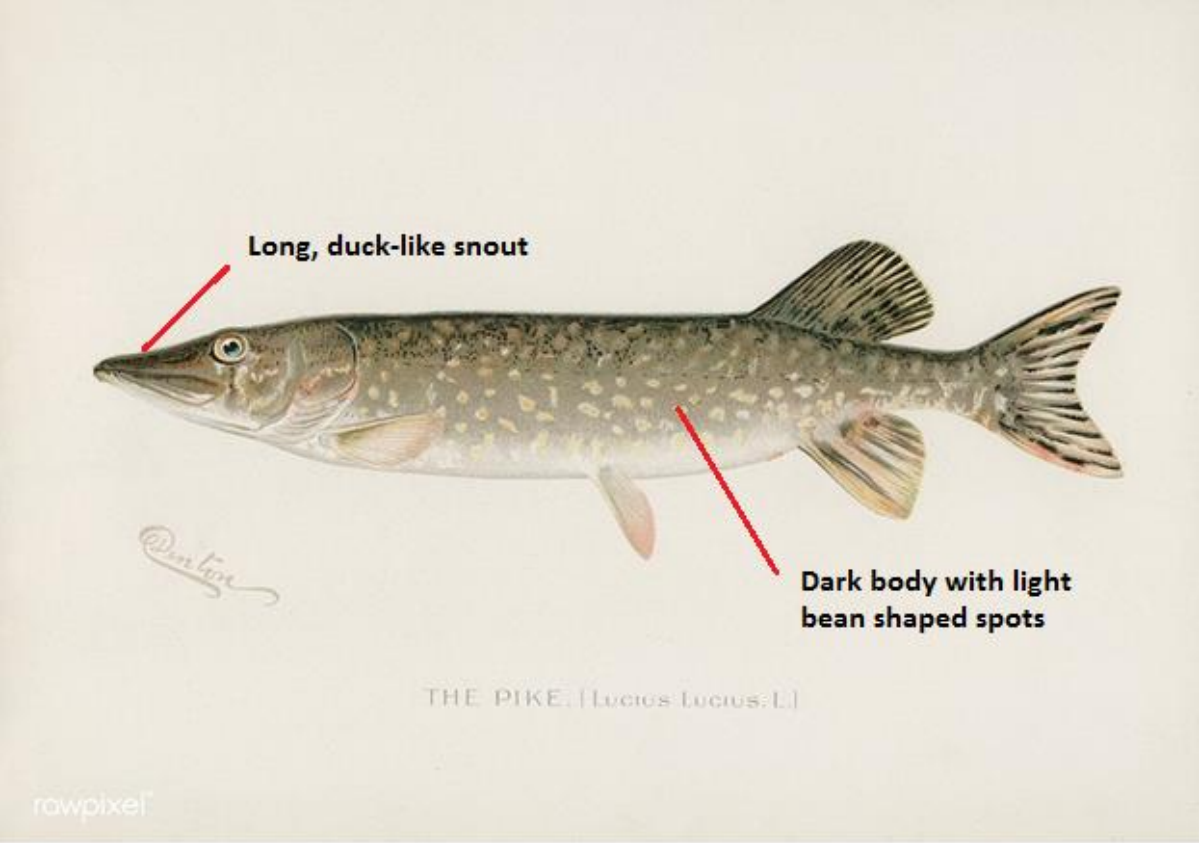
THE ATLANTIC SALMON. (SALMO SALAR.)

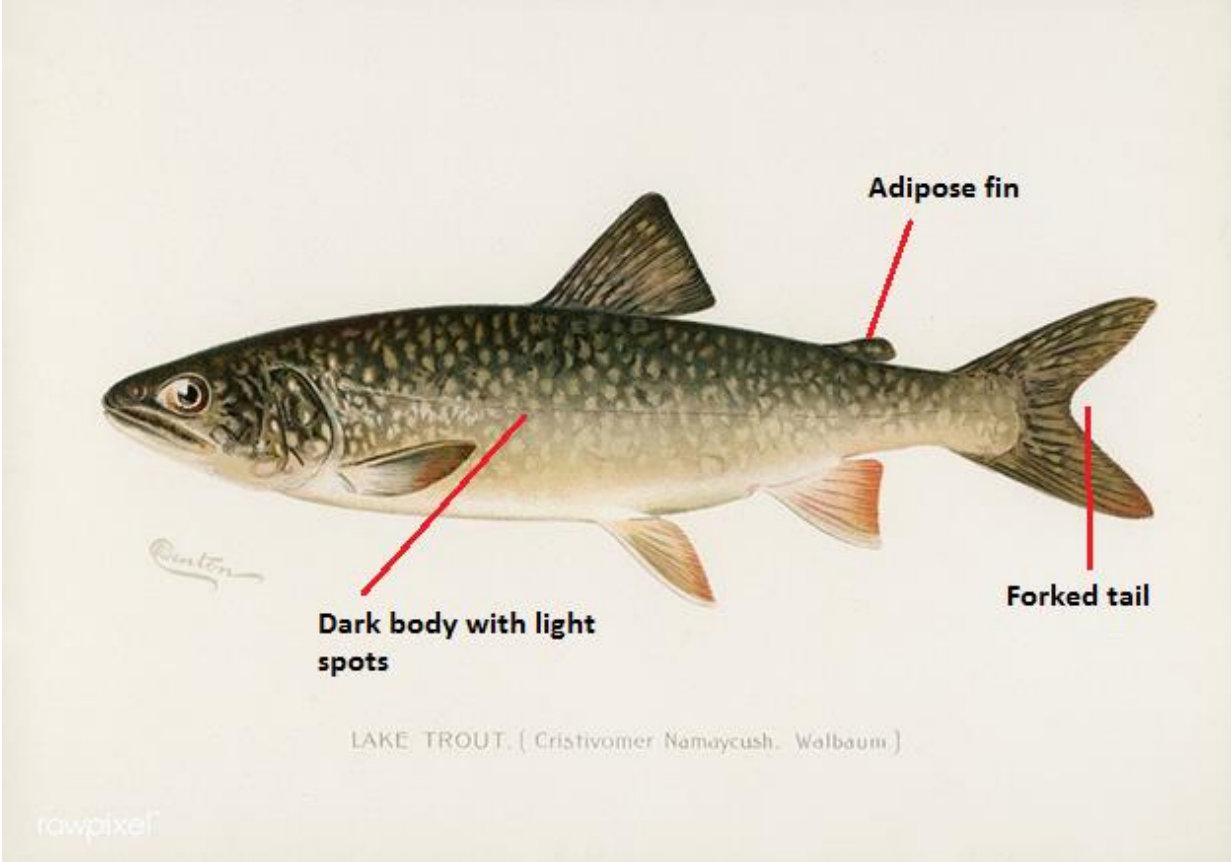
Some Basic Physical Characteristic Differences

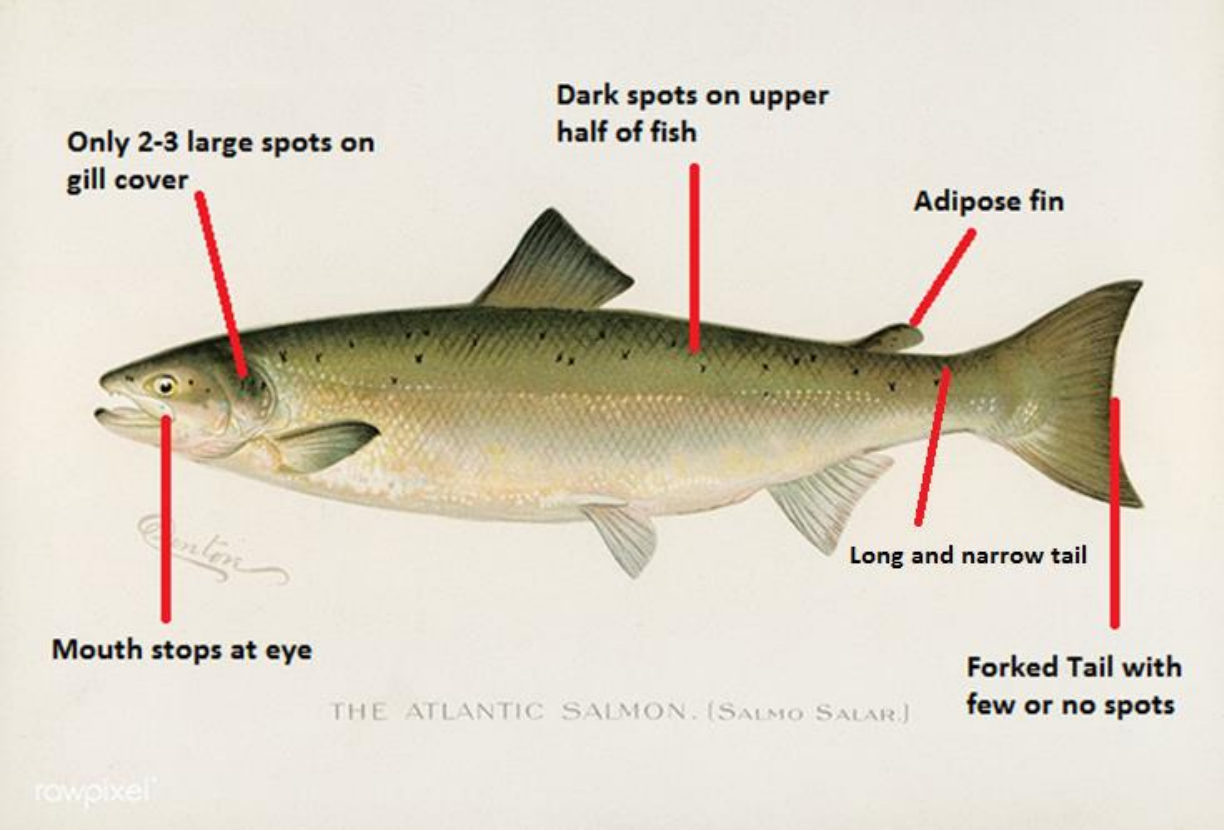




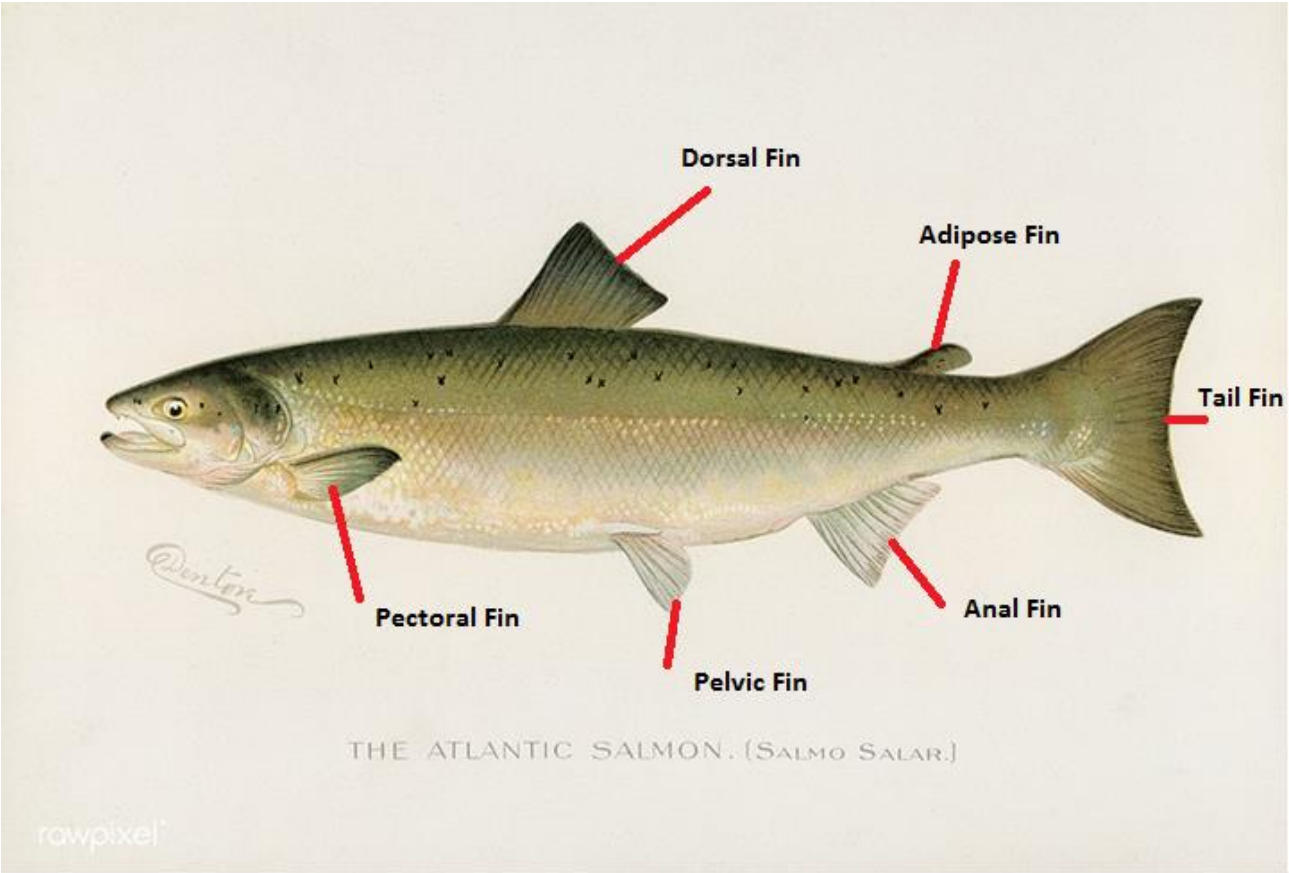

2 distinct dorsal fins
Dark bars
YELLOW OR BARRED PERCH.
(PERCA AMERICANA)
rawpixel


Long, duck-like snout
Dark body with light
bean shaped spots
THE PIKE. (Lucios Lucius. L.)
rawpixel


Adipose fin
Dark body with light spots
Forked tail
LAKE TROUT. (Cristivomer Namaycush. Walbaum.)
rawpixel

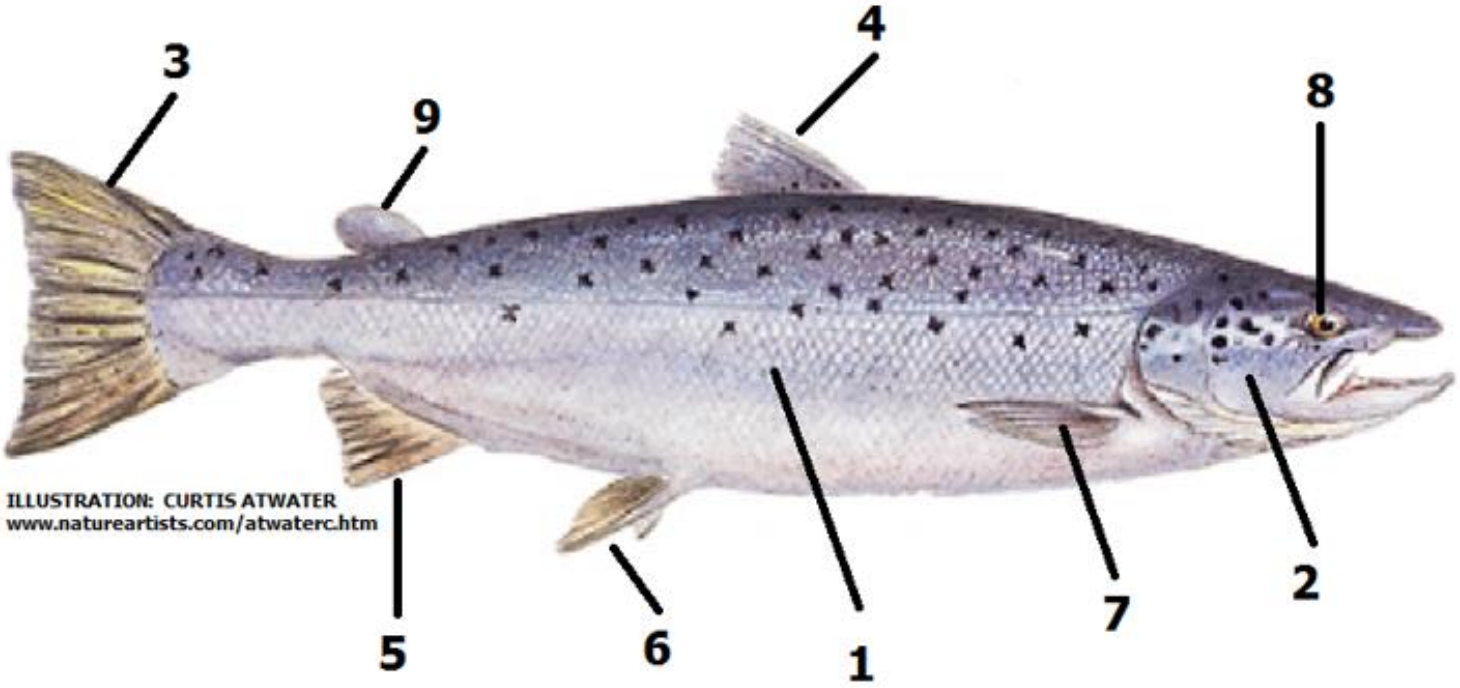

Dark spots on upper half of fish
Only 2-3 large spots on gill cover
Adipose fin
Long and narrow tail
Mouth stops at eye
Forked Tail with few or no spots
THE ATLANTIC SALMON. (SALMO SALAR.)
rawpixel

Fins of a Salmon

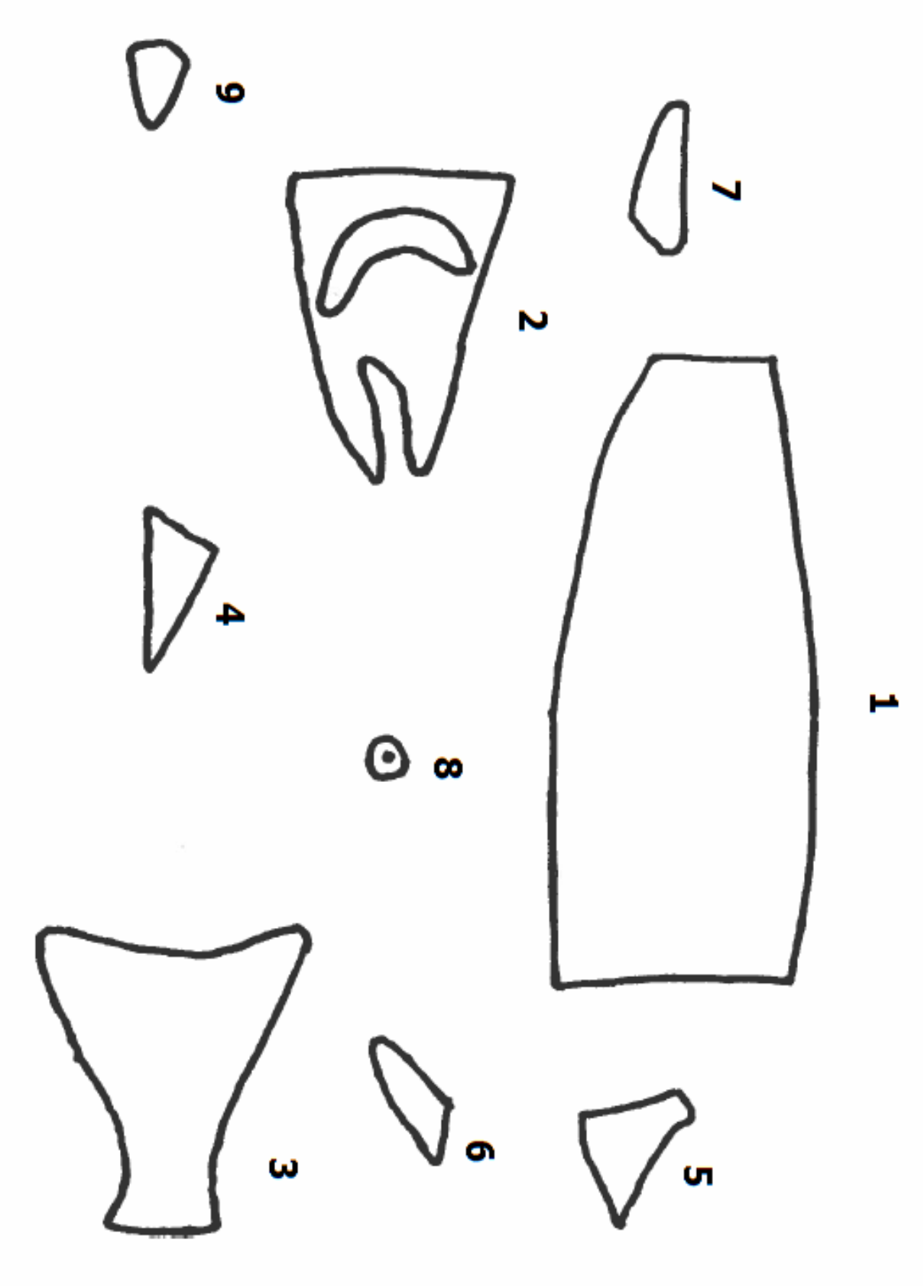


Fish Illustrations from Game Birds and Fishes of North America; illustrated by Sherman F. Denton (1856–1937)

BUILD AN ATLANTIC SALMON



BUILD AN ATLANTIC SALMON (Handout)



Grade 1 Classroom Hatchery Activities

Lesson 2: Life Cycle Bracelet

Lesson Objectives:

- Familiarize students with the life cycle of the Atlantic Salmon;
- Assist students with recognizing and spelling words associated with the Atlantic Salmon Life Cycle.

Materials:

- Scissors;
- Small box or hat;
- Alphabet and coloured beads (either plastic or wood with at least 6 colours) *;
- Bracelet string* (can be elastic cord) cut into 12", one for each student sections with a knot on one end;
- Markers of the same colour as the beads;
- Printed Copy of "Wild Atlantic Salmon: a wondrous life cycle" (found below);
- Printed and cut apart "Life Cycle Stages" list (found below);

* Can be purchased inexpensively at a craft store or dollar tree.

Background

What came first: the Atlantic Salmon adult or the egg? Like all living beings Atlantic Salmon go through a ***life cycle***. The life cycle of a Lake Ontario Atlantic Salmon begins in a cold water stream connected to Lake Ontario. In October or November the female deposits between 2000 and 8000 ***eggs*** in a shallow gravel depression known as a 'redd' and the male fertilizes the eggs. The eggs start to develop. Most notably the eyes become visible; this is referred to as the ***eyed egg*** stage. In January to February the eyed eggs hatch and the tiny fish hide in the gravel and survive by absorbing proteins from their yolk sacs; this is the ***alevin*** stage. In May, as a result of warming temperatures (which increases the abundance of tiny invertebrates - the Atlantic Salmon's prey) the yolk sacs are used up and the small fish, now called ***fry***, move into deeper water to hunt for food. The fry grow throughout the summer and develop dark vertical marks on their sides; at this stage they are called ***parr.*** Parr will live in the stream for 1-3 years before going through the process of smoltification. In this stage they lose the parr marks and become the silvery colour of the adult. At this stage they are known as a ***smolt***. The smolts head down stream and enter the lake where they hunt for fish and grow into ***adults.*** After two to three years in the lake, the adults begin the journey that guides them back to their hatching site. As juveniles the salmon imprinted on the unique odours of their home streams. The returning adults use their sense of smell to guide them upstream to where they hatched; and this is where they will spawn and the life cycle repeats. The adult Atlantic Salmon will return to the lake after spawning and will often live to spawn for several years - which is different than many other species of salmon that die after spawning.

Teaching and Learning Sequence

Part A. Share this **Cool Atlantic Salmon Fact:** *The largest Atlantic Salmon ever caught was 174 cm long. How tall is your teacher? How tall are you?*

Part B. Define **Life Cycle** = *The series of changes that an organism goes through as it grows, reproduces and eventually dies.* Ask these **Guiding Questions** for the students to discuss as a group.

1. What is the life cycle of a tree? (seed, seedling, sapling, mature tree, flowering/seed producing tree...)
2. What is the life cycle of a human? (egg, fetus, baby, toddler, child, teen, adult, parent…)

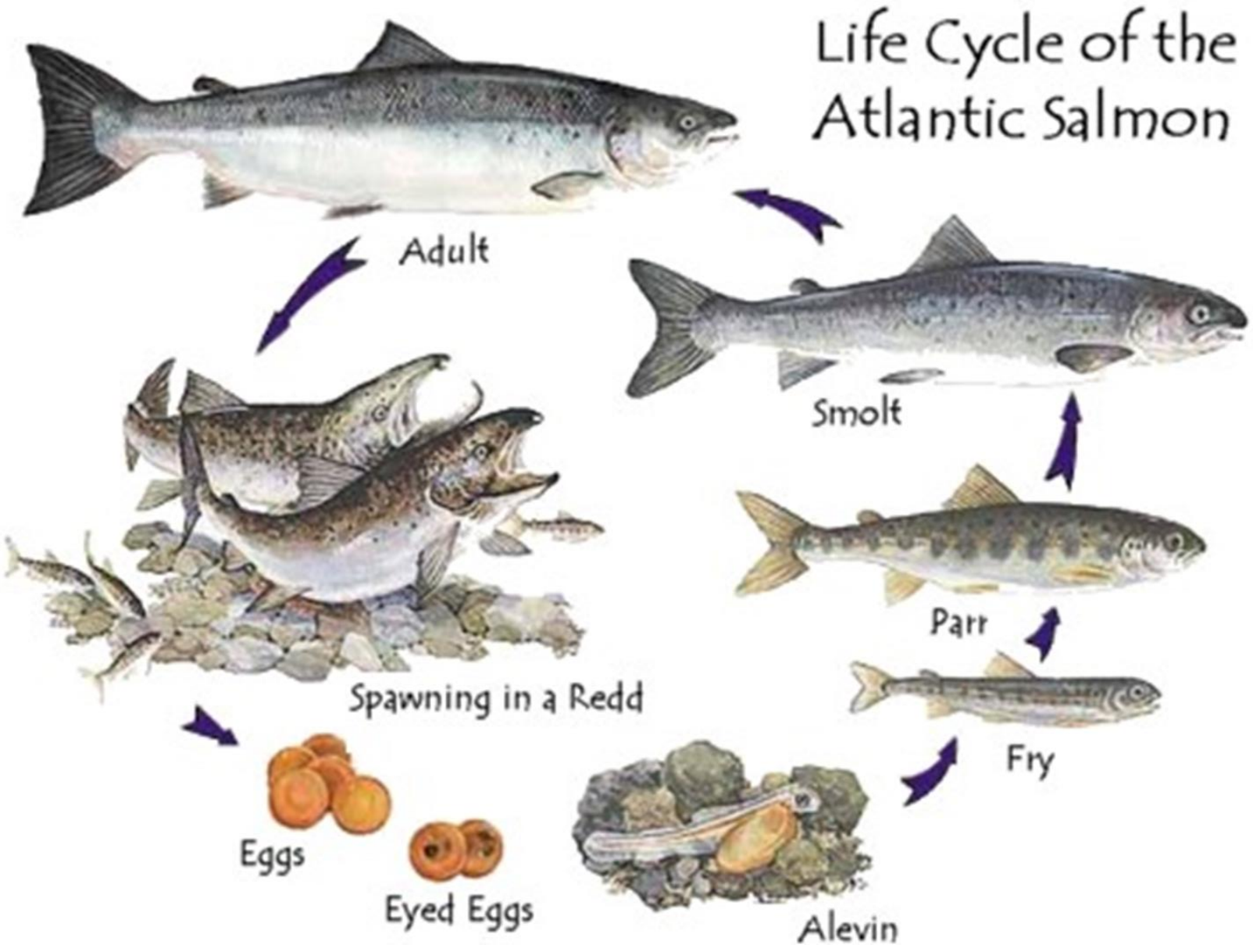
Part C.

9. Show **"Wild Atlantic Salmon: a wondrous life cycle"** found below. This can be digitally displayed for the purpose of illustration but should also be printed out and displayed near the aquarium set up;
10. Explain each stage of the life cycle as per the background above;
11. Cut apart the **"Life Cycle Stages"** list, place in a box or hat and have students select one word each;
12. As a group choose which coloured bead will correspond to each life cycle stage. If you have more than 6 colours you can also include the eyed egg and spawning stages. Mark each stage on the printout accordingly;
13. Give each student a length of string and have them start to put the coloured beads on the string in the order of the life cycle. Have them spell out their word in the middle of the bracelet and in the correct life cycle placement;
14. Assist the students with getting to the correct length and tying the bracelet. This can also be done by making a loop on one end and pulling it through a larger bead.

Part D. Have the students organize themselves in a circle in the order of the life stages on their bracelets. Numbers will not likely work out perfectly and some students may have to double up (i.e. 2 eggs next to each other).

Ask these **Reflection Questions** (can be done as a Think, Pair, Share by having them organize in groups of complete cycles.)

1. What happens if a life stage is removed?
2. Is a life cycle a straight line or a circle? (You want them to get the idea that life is a continuous cycle of birth, growth, reproduction.)


Life Cycle of the
Atlantic Salmon
Adult
Smolt
Parr
Fry
Alevin
Eggs
Eyed Eggs
Spawning in a Redd

Life Cycle Stages

EGG	ALEVIN	FRY
PARR	SMOLT	ADULT
EGG	ALEVIN	FRY
PARR	SMOLT	ADULT
EGG	ALEVIN	FRY
PARR	SMOLT	ADULT
EGG	ALEVIN	FRY
PARR	SMOLT	ADULT
EGG	ALEVIN	FRY
PARR	SMOLT	ADULT
EGG	ALEVIN	FRY
PARR	SMOLT	ADULT

Grade 2 Classroom Hatchery Activities

Lesson 3: Life Cycle Diagram

Lesson Objectives:

- Familiarize students with the life cycle of the Atlantic Salmon;
- Assist students in recognizing and spelling words associated with the Atlantic Salmon Life Cycle.

Materials:

- Printed Copies of "Life Cycle of the Atlantic Salmon" worksheet (found below – 1 per student);
- Projector with access to YouTube.

Background:

What came first, the Atlantic Salmon adult or the egg?

Like all living beings Atlantic Salmon go through a ***life cycle***. The life cycle of a Lake Ontario Atlantic Salmon begins in a cold water stream connected to Lake Ontario. In October or November the female deposits between 2,000 and 8,000 ***eggs*** in a shallow gravel depression known as a 'redd' and the male fertilizes the eggs. The eggs start to develop, and eventually the eyes become visible; this is referred to as the ***eyed egg*** stage. In January/February the eyed eggs hatch and the tiny fish hide in the gravel and survive by absorbing proteins from their yolk sacs; this is the ***alevin*** stage. In May, corresponding with warming temperatures (which increases the abundance of tiny invertebrates - the Atlantic Salmon's prey food) the yolk sacs are used up and the small fish, now called ***fry***, move into deeper water to hunt for food. The fry grow throughout the summer and develop dark vertical marks on their sides, called parr marks; at this stage they are called ***parr.*** Parr will live in the stream for 1-3 years before becoming ***smolts***. In this stage they lose the parr marks and become the silvery colour of the adult. The smolts head downstream and enter the lake where they hunt for fish and grow into ***adults.*** After one to three years in the lake, the adults begin the journey that guides them back to their birth site. As juveniles the salmon imprinted on the unique odours of their home streams. The returning adults use their sense of smell to guide them upstream to where they hatched; and this is where they will spawn and the life cycle repeats. The adult Atlantic Salmon will return to the lake after spawning and will often live to spawn for several years - which is different from many other species of salmon that die after spawning.

Teaching and Learning Sequence

Part A. Share this **Cool Atlantic Salmon Fact:** *The largest Atlantic Salmon ever caught was 174 cm long. How tall is your teacher? How tall are you?*

Part B. Define **Life Cycle** = *The series of changes that an organism goes through as it grows, reproduces and eventually dies.*

Ask these **Guiding Questions** for the students to discuss as a group.

1. What is the life cycle of a tree? (seed, seedling, sapling, mature tree, flowering/seed producing tree...)
2. What is the life cycle of a human? (egg, fetus, baby, toddler, child, teen, adult, mom/dad…)

Part C. Distribute the worksheets and have the students attempt to complete them while you stream the videos below. When the videos are finished take up the worksheet as a group. If time allows the students can colour the diagram.

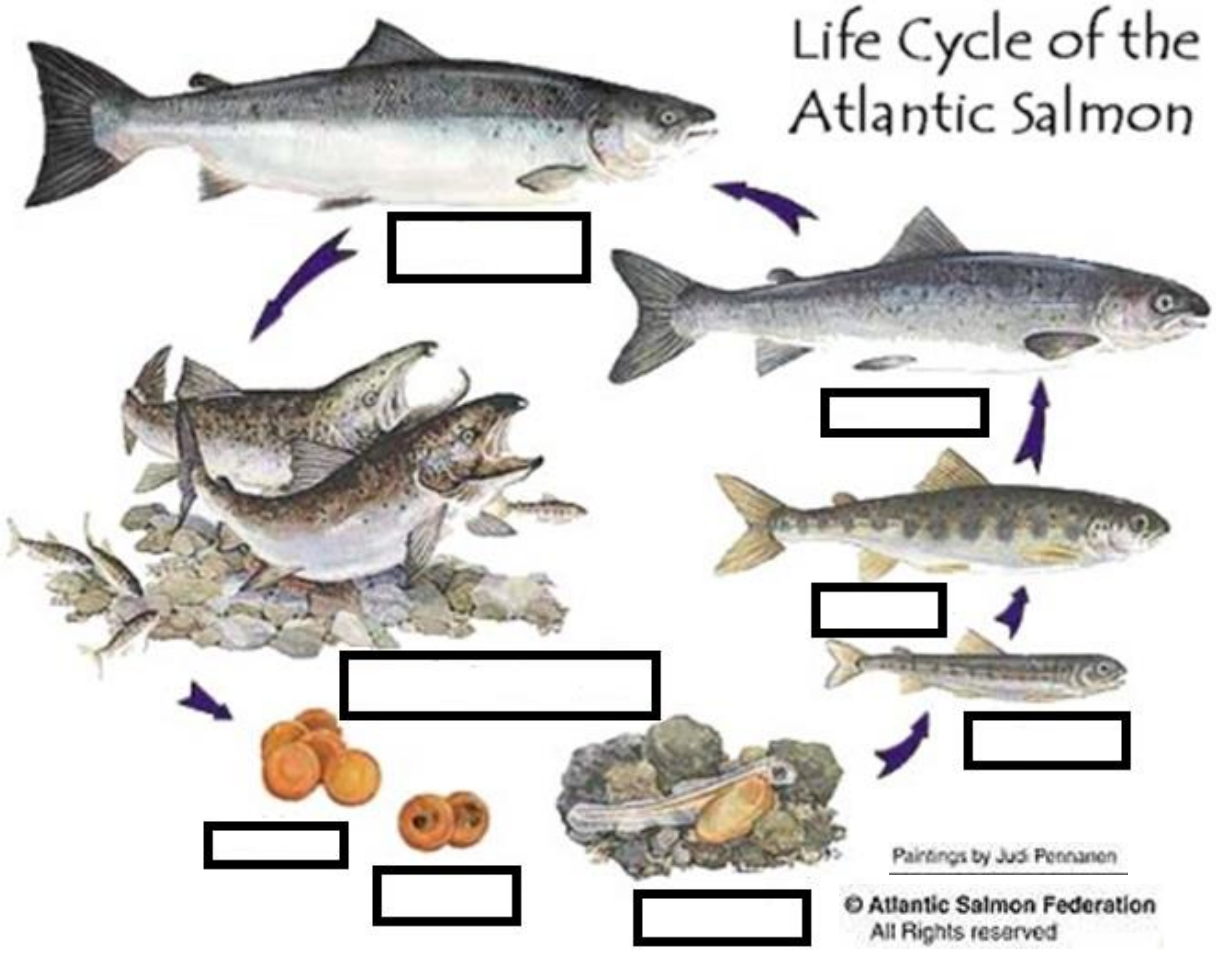
- The Life Cycle of the Atlantic Salmon (animation – 5 minutes) https://www.youtube.com/watch?v=2fGLzEvWuYA
- To The Journey's End: The Lifecycle of the Atlantic Salmon (31 minutes) https://www.youtube.com/watch?v=65EfljADGSc&t=1077s

Part D. Ask these **Reflection Questions** (can be done as a Think, Pair, Share)

1. What happens if a life stage is removed?
2. Is a life cycle a straight line or a circle? (You want them to get the idea that life is a continuous cycle of birth, growth, reproduction.)

Name:

Using the words at the bottom of the page label the diagram below.



SPAWNING IN A REDD	ALEVIN	SMOLT	EGG
EYED EGG	PARR	FRY	ADULT

Grade 2 Classroom Hatchery Activities

Lesson 4: Draw an Atlantic Salmon

Lesson Objectives:

- Familiarize students with the identification of Atlantic Salmon;
- Familiarize students with basic fish biology, identification, and terminology;
- Assist students in recognizing the value of proper species identification.

Materials:

- Projector connected to computer or printed presentation (found below);
- Blank paper (1 sheet for each student);
- Pencils and pencil crayons (enough for all the students).

Background

Ontario is home to nearly 150 fish species; 129 of them being native. Proper identification of individual species is useful for monitoring (species presence and location, population size, fish health…), and for managing and complying with fishing regulations. Identification can help us to connect deeper with a species as we start to see patterns and understand more about their life stories. It can also be a lot of fun!

Fish, just like all other animals, plants, and fungi, have unique physical characteristics that distinguish one species from another. Size, colouration, shape, and presence or absence of particular features are some of these characteristics. Atlantic Salmon like other salmon have an adipose fin (the small fin on the back of the fish just forward of the tail) and a soft dorsal fin. The Atlantic Salmon has dark spots on a lighter coloured body, only 2- 3 large spots on the gill cover, a mouth that stops at the eye, and a long narrow caudal peduncle (part just forward of the tail fin). These characteristics are shown in the presentation below.

It is important that anglers can properly identify Atlantic Salmon so they can properly follow fishing regulations. Anglers with proper identification skills can be valuable citizen scientists and contribute to monitoring efforts.

Teaching and Learning Sequence

Part A. Share this **Cool Atlantic Salmon Fact:** *Atlantic salmon are known as the "Leaper". They can jump out of the water 3 metres high! That is as high as a basketball*

Part B. Ask these **Guiding Questions**

1. Has anyone ever seen an Atlantic Salmon? (they may have seen them in the grocery store – all of those fish are farmed!)
2. How might you tell the difference between an Atlantic Salmon and another fish?

Part C. Present **"Basic Fish ID"** (on a projector screen or print/display to class).

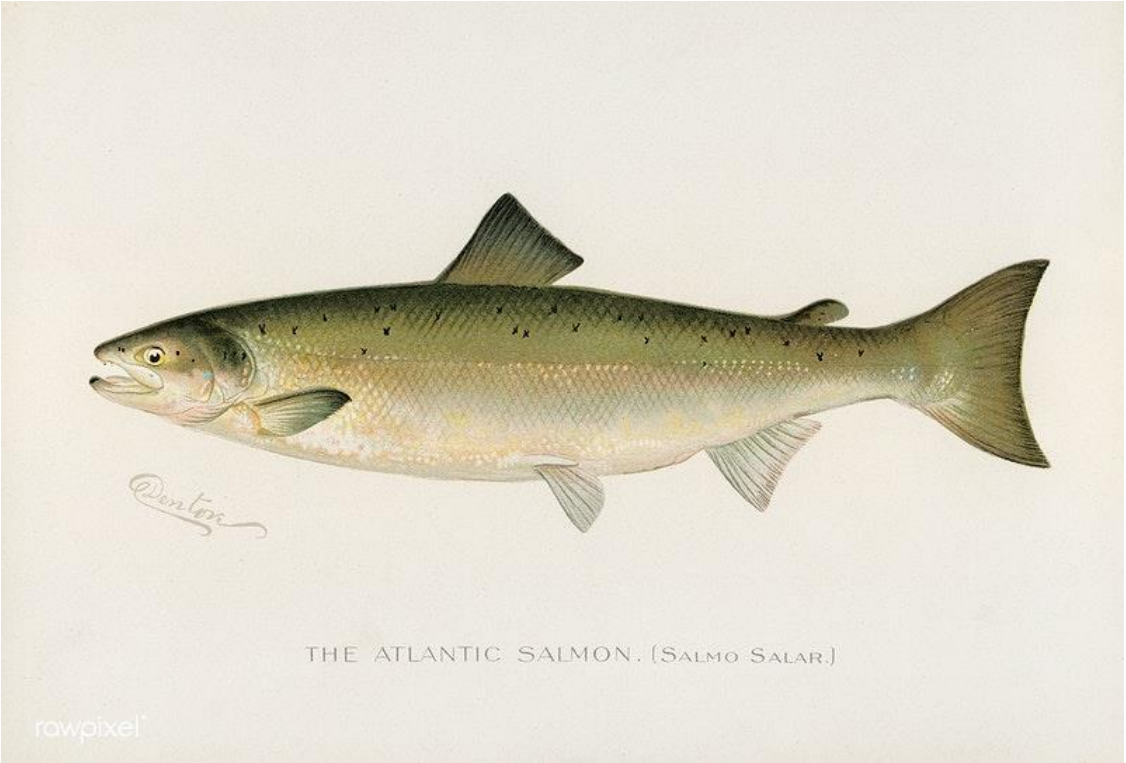
15. Page 1 of Presentation: Allow time for the students to talk about what they see. You are not looking for specific answers; rather, engaging their observation skills.
16. Ask the students how a fish breathes? Point out and define the ***gills*** = *The breathing organ of fish and some other animals used to extract oxygen from water.*
17. Page 2- 4: Show the 1 or 2 characteristics identified on each fish. This can be done quickly and is intended to show the students some of the main physical differences between fish. Atlantic Salmon being our focal fish has more characteristics identified.
18. Page 5 shows the fins of the Atlantic Salmon. The presence of these fins are characteristic of all the salmon species. Point out and define the ***adipose fin*** = *A small fleshy fin just ahead of the tail. Found on only a small number of fish species including salmon*.
19. Supply students with blank paper, pencils, and pencil crayons.
20. Displaying "**Draw an Atlantic Salmon",** have the students go step by step through the activity.
21. The students can now colour the fish and the background if they choose. For an Atlantic Salmon in the lake the colour of the back can be brown, blue, or green; the sides are silvery and the belly is white. When the fish leaves the lake to enter streams to spawn they lose their silvery colour, become darker and may develop red spots. They can also name their fish and use this name for the fish they release in the spring!

Part D. Ask these **Reflection Questions** (can be done as a Think, Pair, Share)

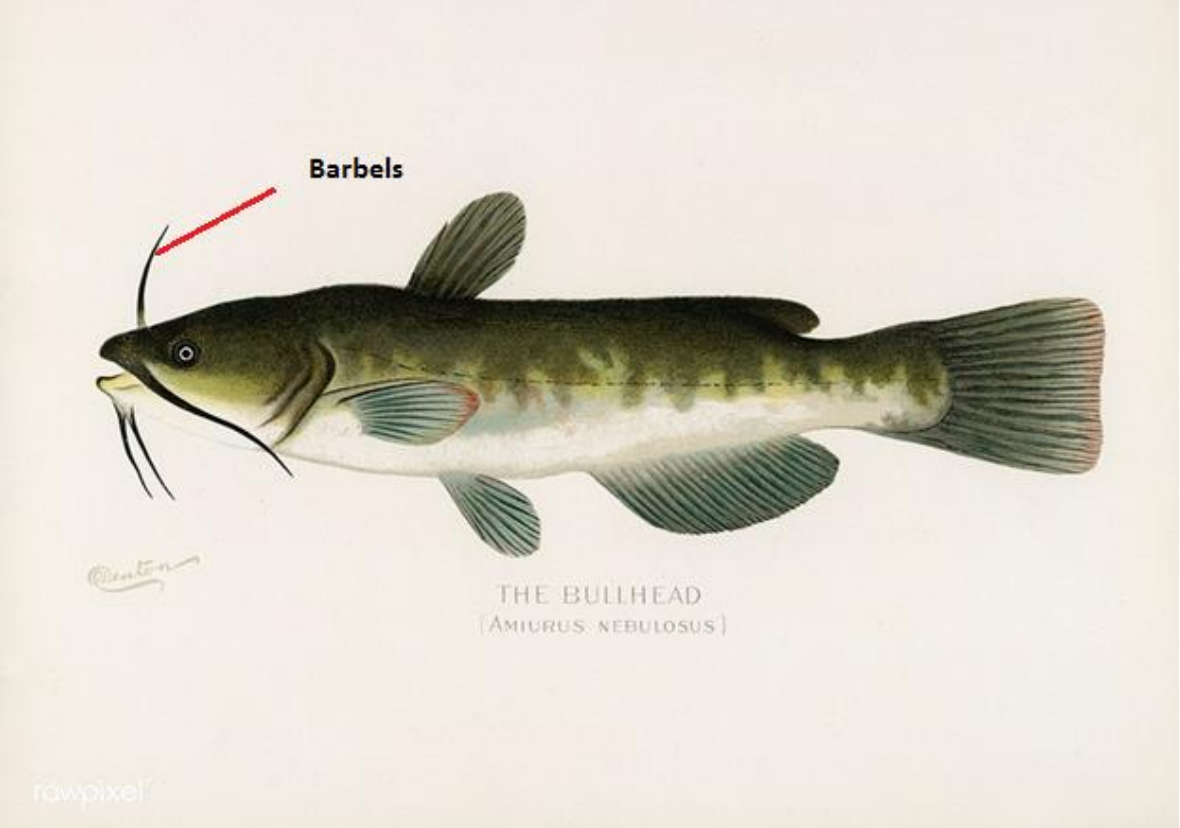
1. Why is the proper identification of fish important?
2. Name some identifying characteristics of an adult Atlantic Salmon.

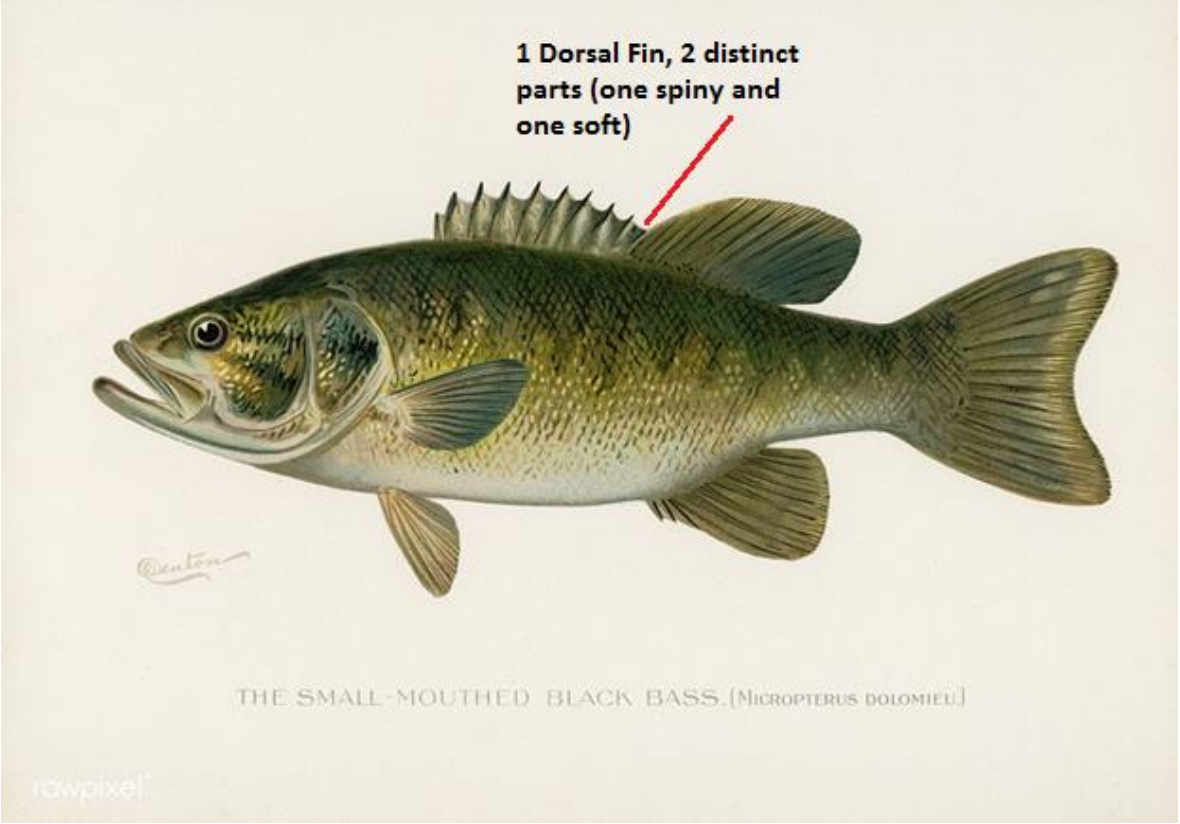
Presentation: Basic Fish Identification

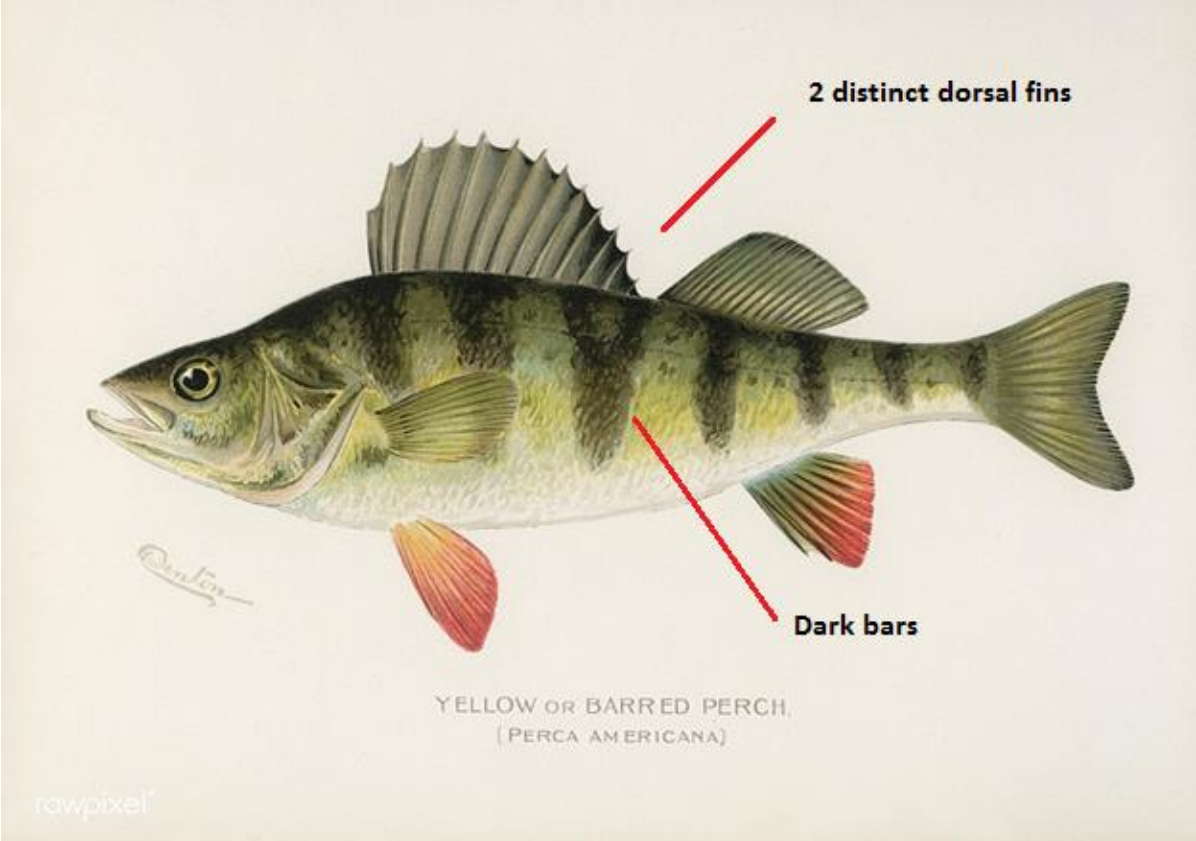
What Differences Do You See?

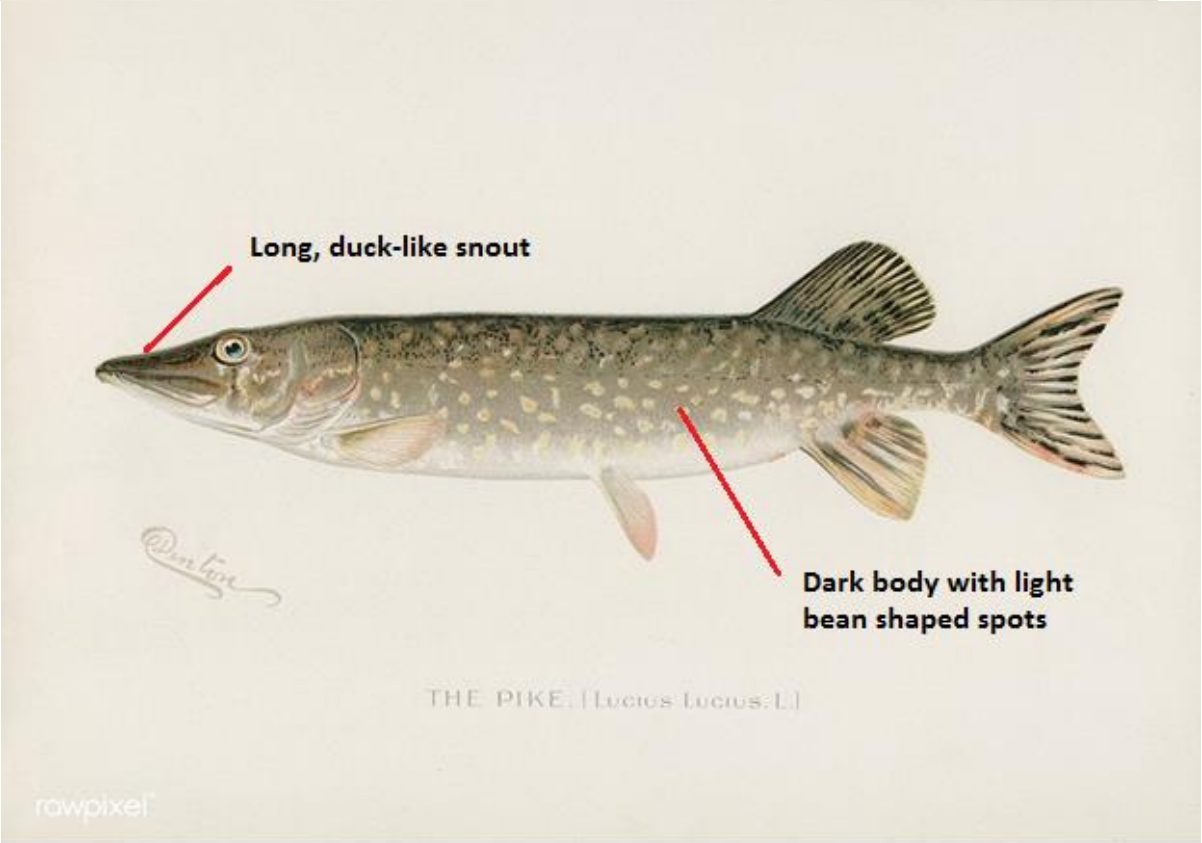


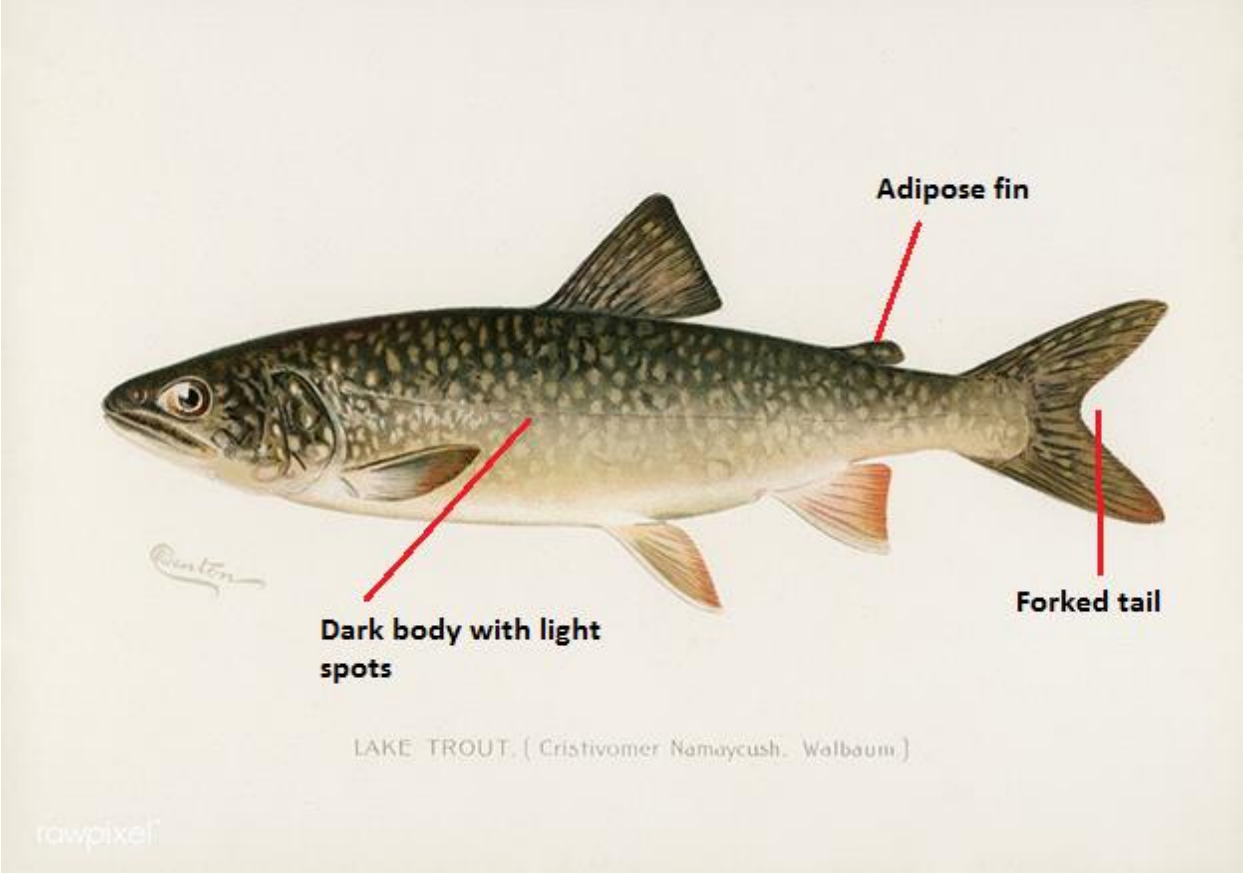
Some Basic Physical Characteristic Differences

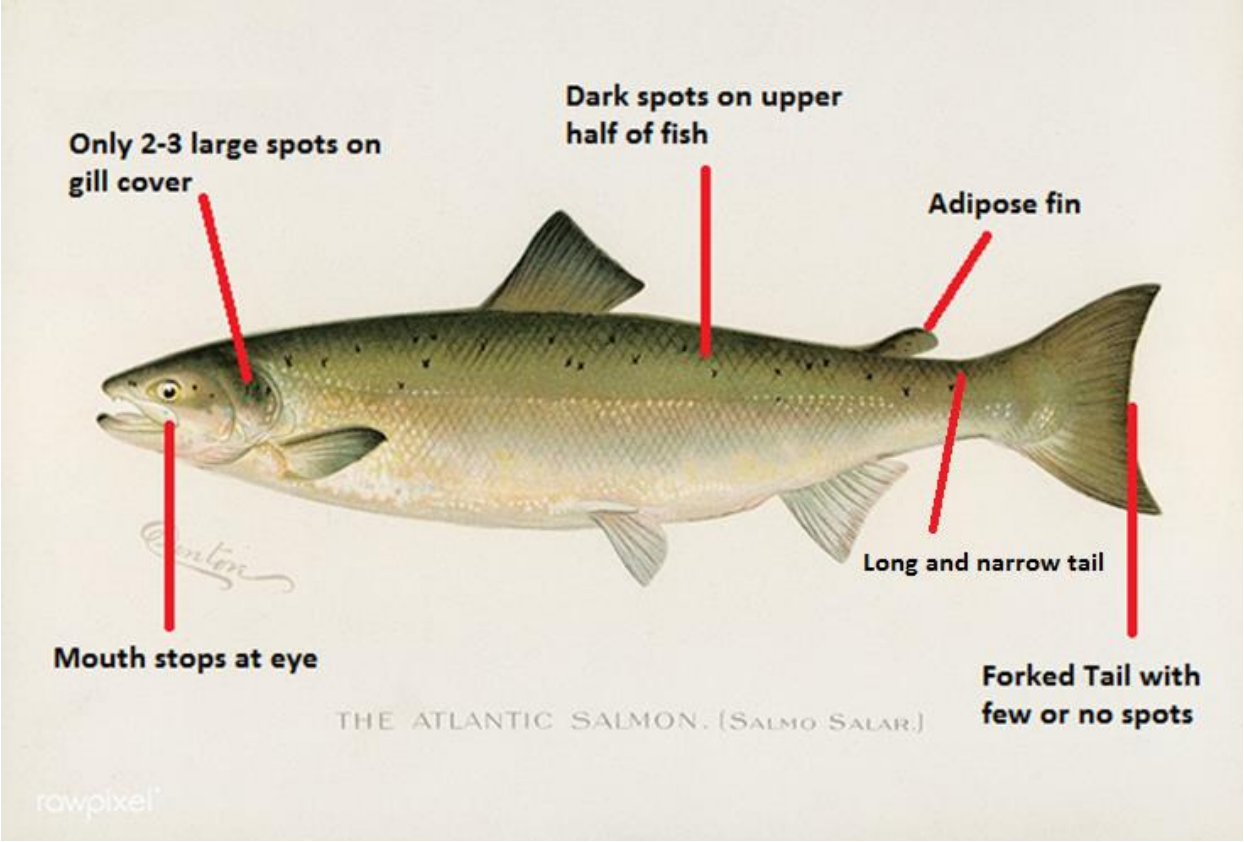




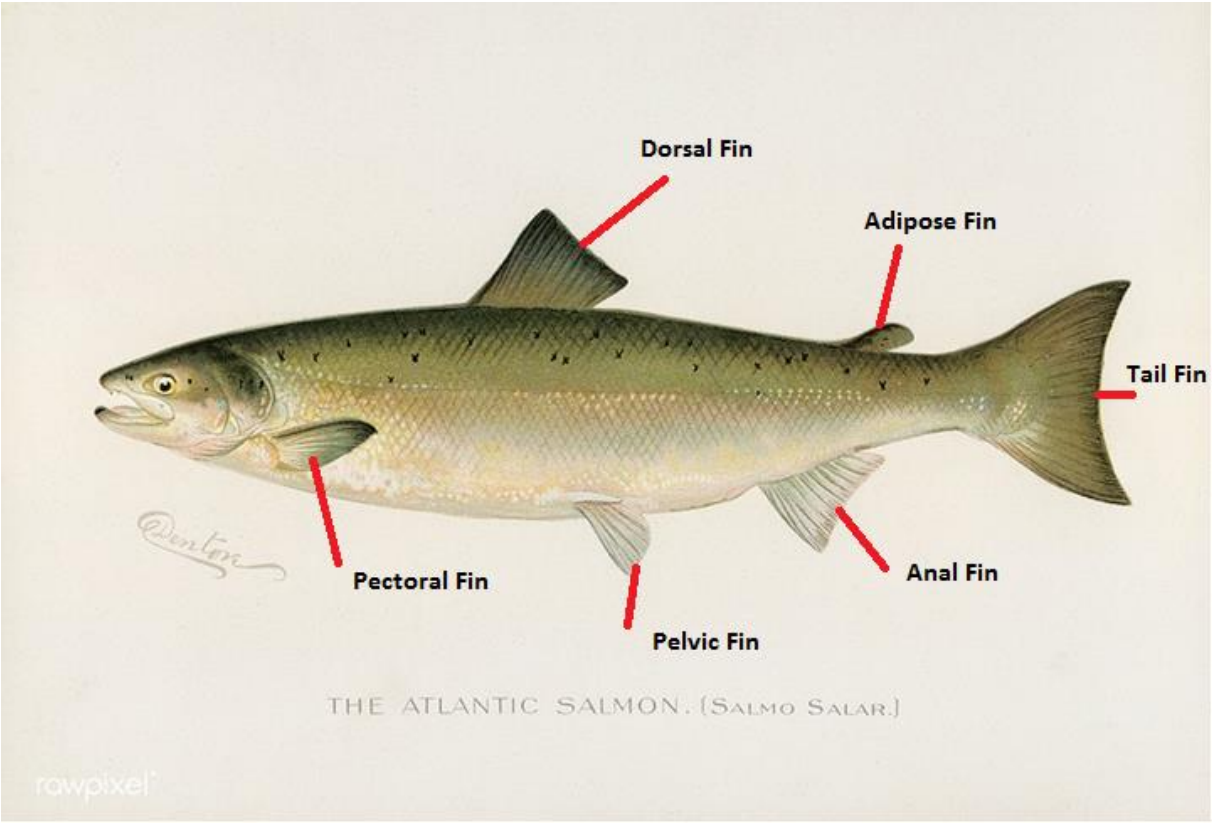

2 distinct dorsal fins
Dark bars
YELLOW OR BARRED PERCH.
(PERCA AMERICANA)
rawpixel


Long, duck-like snout
Dark body with light
bean shaped spots
THE PIKE. (Lucius Lucius. L.)
rawpixel


Adipose fin
Forked tail
Dark body with light spots
LAKE TROUT. [Cristivomer Namaycush. Walbaum.]
rawpixel


Dark spots on upper half of fish
Only 2-3 large spots on gill cover
Adipose fin
Long and narrow tail
Mouth stops at eye
Forked Tail with few or no spots
THE ATLANTIC SALMON. [SALMO SALAR.]
rawpixel

Fins of a Salmon



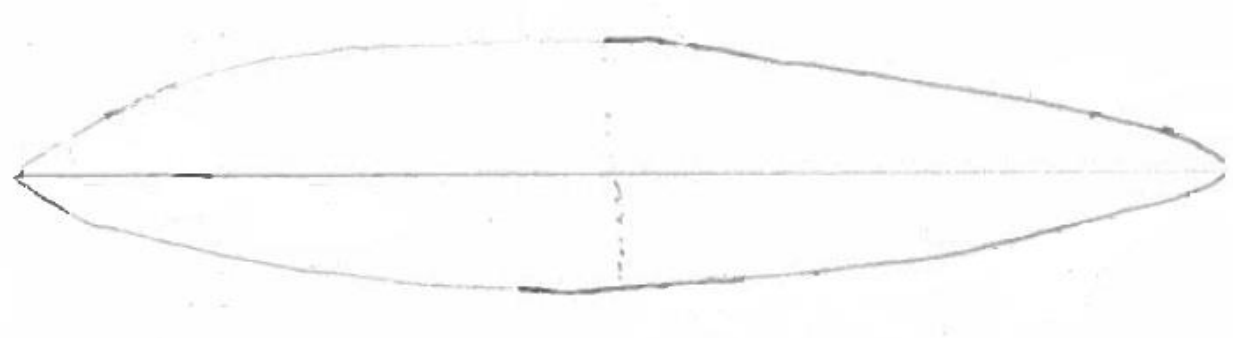
Fish

Illustrations from Game Birds and Fishes of North America; illustrated by Sherman F. Denton (1856–1937)

Draw an Atlantic Salmon

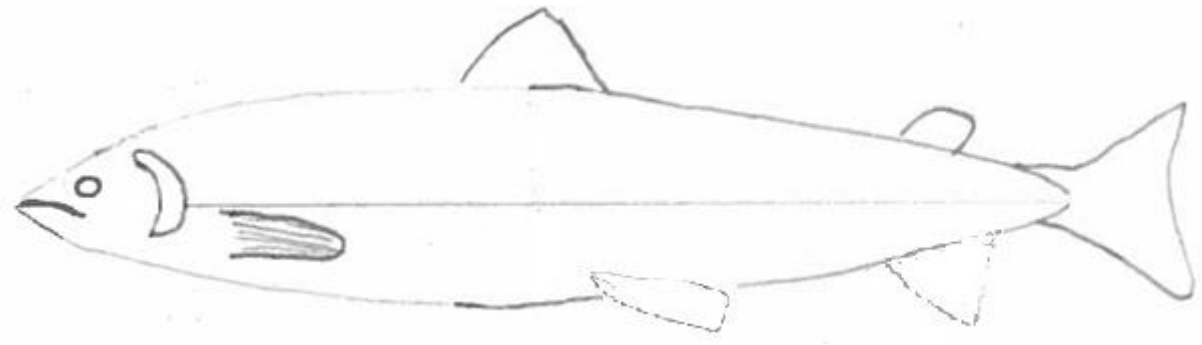
Step 1: Draw a straight horizontal line. This is called the lateral line.

Step 2: Draw arches on the top and bottom of the line.

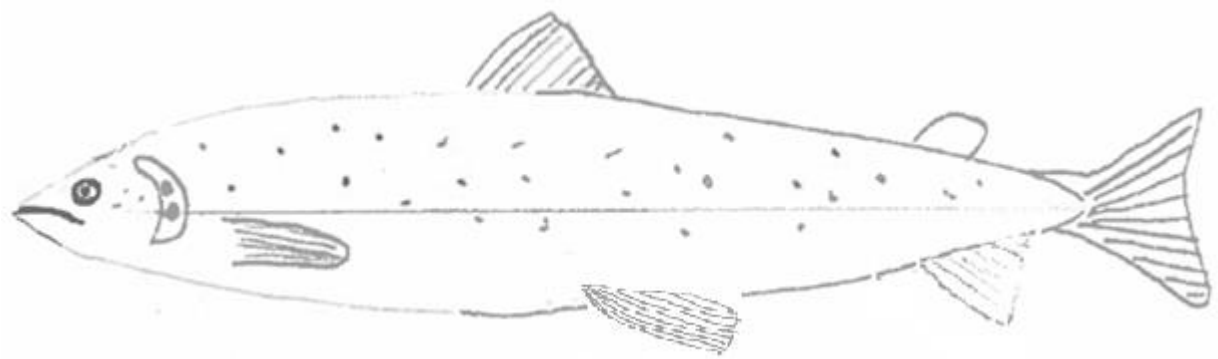


Step 3: Add the gill cover (crescent shape), eye, and mouth. The mouth does not go past the eye!

Step 4: Draw the pectoral, pelvic, tail, adipose, and dorsal fins. The tail is slightly forked.



Step 5: Add 2-3 dots on the gill cover. Add dots (sometimes dots are x shaped) above the lateral line and a few below.



Step 6: Colour and display your fish!

Grade 3 Classroom Hatchery Activities

Lesson 5: Identifying Atlantic Salmon

Lesson Objectives:

- Familiarize students with the identification of Atlantic Salmon;
- Familiarize students with basic fish biology, identification, and terminology;
- Assist students to recognize the value of proper species identification.

Materials:

- Projector connected to computer or printed presentation (found below);
- Copies of last page of lesson (enough for groups of 2-3);
- Pencils;
- Field Guide on Fish if available (from home or library)

Background

Ontario is home to nearly 150 fish species, 129 of which are native. Proper identification of individual species is useful for monitoring (species presence and location, population size, fish community health…), and for managing and complying with fishing regulations. Identification can also help build a deeper connection with a species enabling the observation of patterns and life stories. It can also be a lot of fun!

Fish just like all other living things have unique physical characteristics that distinguish one species from another. Size, colouration, shape, and presence or absence of particular features are some of these characteristics. Atlantic Salmon like other salmon have an adipose fin (the small fin on the back of fish just ahead of tail) and a soft dorsal fin. The Atlantic Salmon has dark spots (sometimes x shaped) on a lighter coloured body, only 2-3 large spots on the gill cover, a mouth that stops at the eye, and a long narrow caudal peduncle (the part of the fish just forward of the tail). These characteristics are shown in the presentation below.

It is important that scientists and anglers can properly identify Atlantic Salmon to give the Atlantic Salmon the best level of care and so that anglers can follow fishing regulations. Anglers with proper identification skills can be valuable citizen scientists who can greatly contribute to monitoring efforts.

Teaching and Learning Sequence

Part A. Share this **Cool Atlantic Salmon Fact:** *Atlantic salmon are known as the "Leaper". They can jump out of the water 3 metres high! That is as high as a basketball net!!*

Part B. Ask these **Guiding Questions**

1. Has anyone ever seen an Atlantic Salmon? (they may have seen them in the grocery store – all of these fish are farmed!)
2. How might you tell the difference between an Atlantic Salmon and another fish?

Part C. Present **"Basic Fish ID"** (on a projector screen or print/display to class).

22. Page 1 of Presentation: Allow time for the students to talk about what they see. You are not looking for specific answers; rather engaging their observation skills.
23. Ask the students how a fish breathes? Point out and define the ***gills*** = *The breathing organ of fish and some other animals used to extract oxygen from water.*
24. Page 2- 4: Show the 1 or 2 characteristics identified on each fish. This can be done quickly and is intended to show the students some of the main physical differences between fish. Atlantic Salmon being our focus fish has more characteristics identified.
25. Page 5 shows the fins of the Atlantic Salmon. The presence of these fins are characteristic of all the salmon species. Point out and define the ***adipose fin =*** *A small fleshy fin just ahead of the tail. Found on only a small number of fish species including salmon*.
26. Divide students into groups of 2-3 and give each group a copy of the final (7th) page of this lesson.
27. Displaying page 6 of the presentation, have the students use the displayed page 7 to identify each fish and write 3 identifying characteristics as per the sheet.

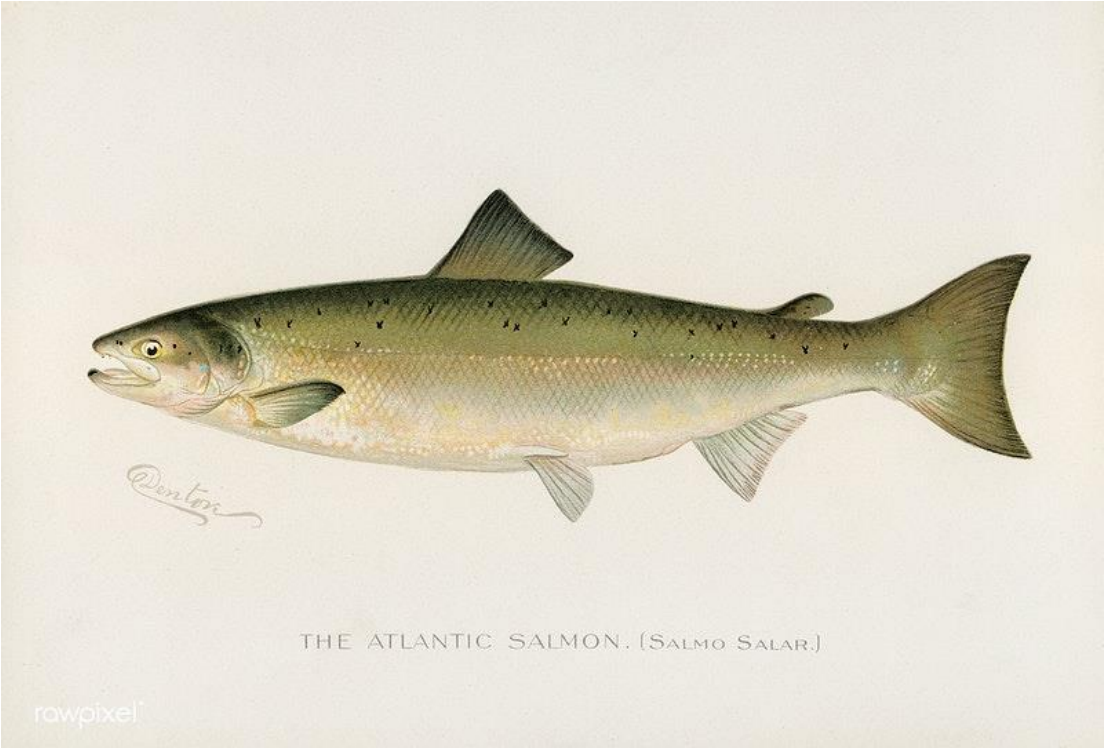
ANSWER KEY: *All have adipose fins* 1st Fish: Chinook Salmon (no spots on gill cover, black mouth, black gums, spots on tail); 2nd: Brown Trout (spots on gill cover, no spots on tail); 3rd: Atlantic Salmon (2-3 spots on gill cover, mouth stops at the eye, pale mouth, few or no spots on the tail, dark spots on upper half of the body, long narrow caudal peduncle); 4th: Coho Salmon (no spots on gill cover, black mouth, pale gums, spots on upper lobe only of tail); Rainbow Trout (no spots on gill cover, spots on tail, pale mouth)

Part D. Ask these **Reflection Questions** (can be done as a Think, Pair, Share in their existing groups)

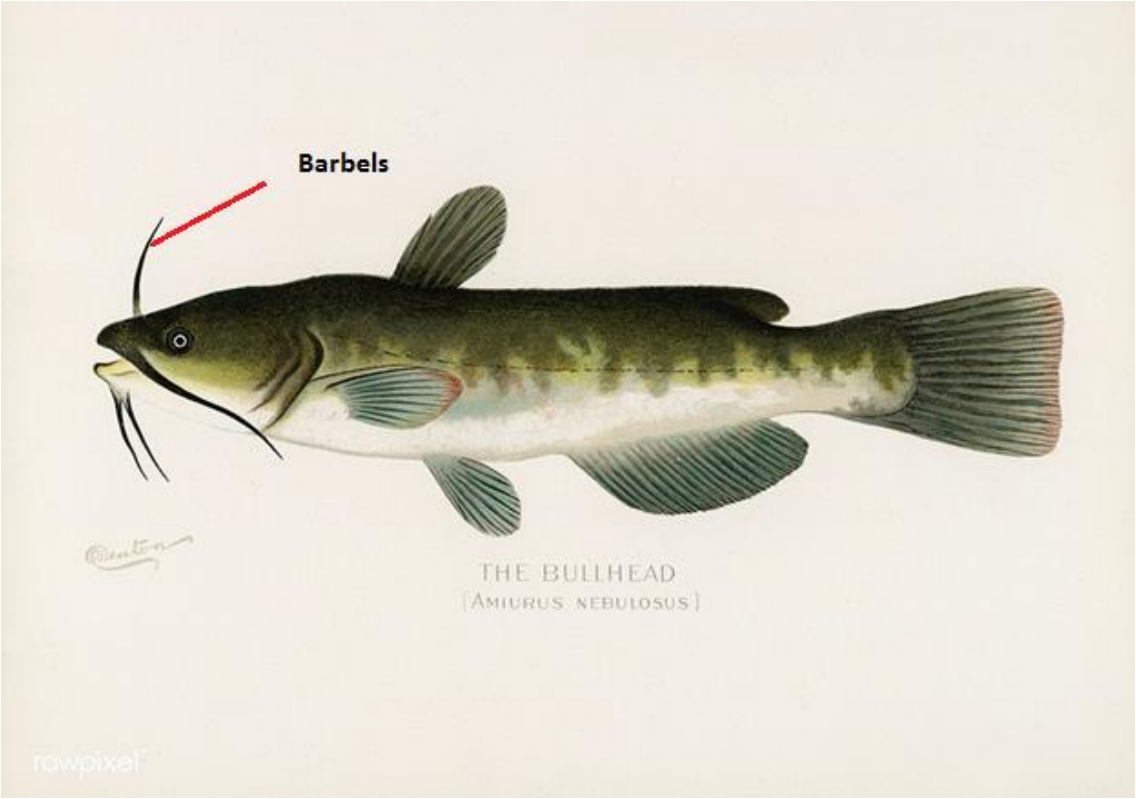
1. Why is the proper identification of fish important?
2. Name some identifying characteristics of an adult Atlantic Salmon.

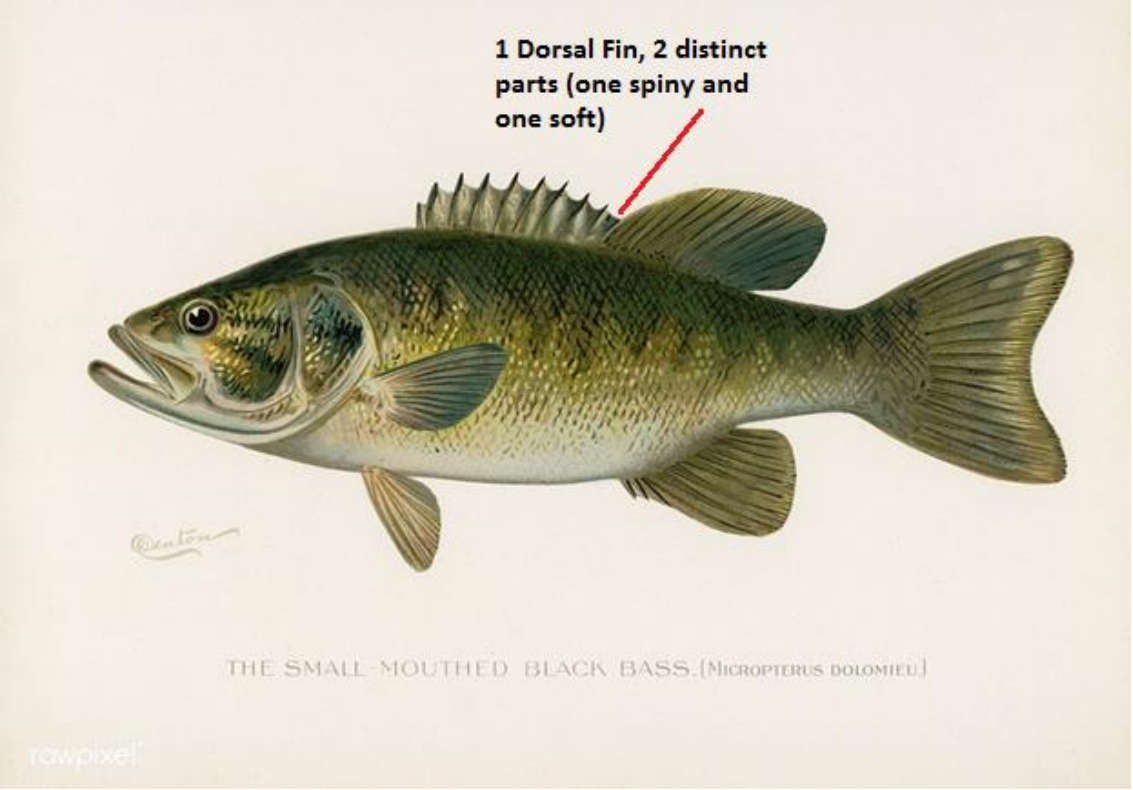
Presentation: Basic Fish Identification

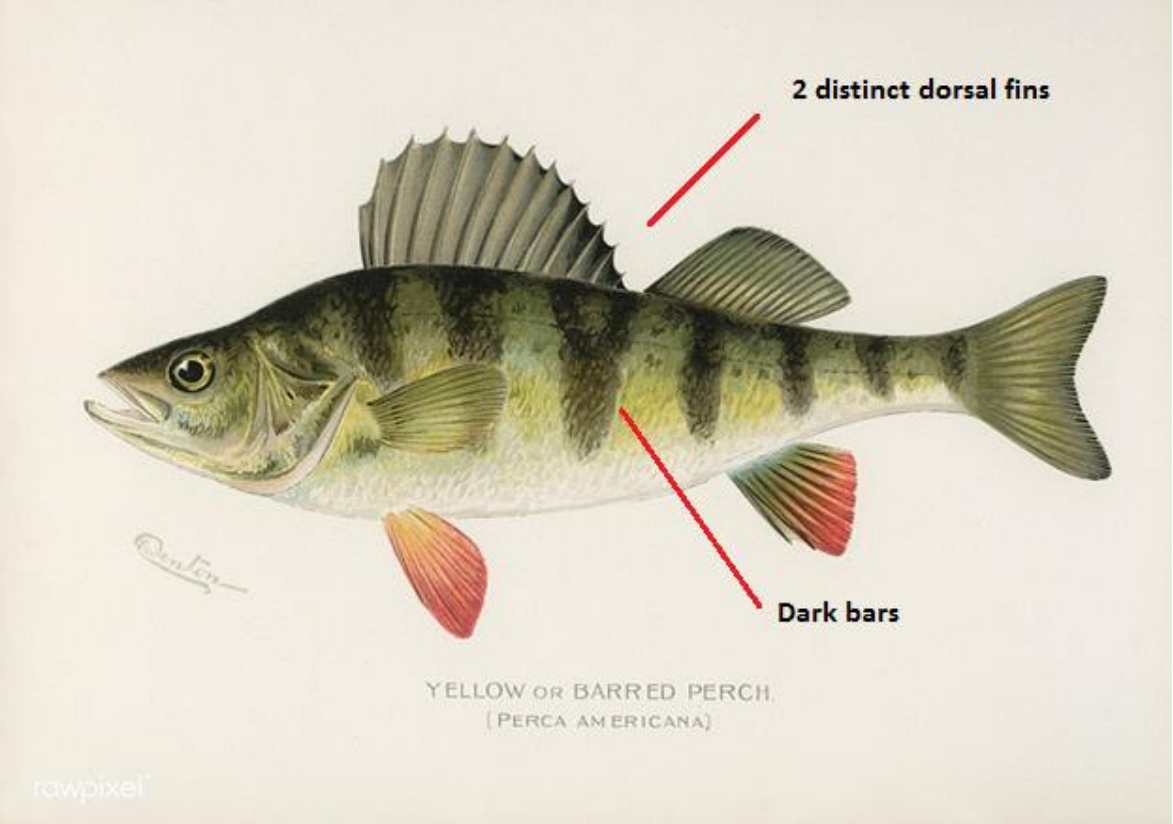
What Differences Do You See?

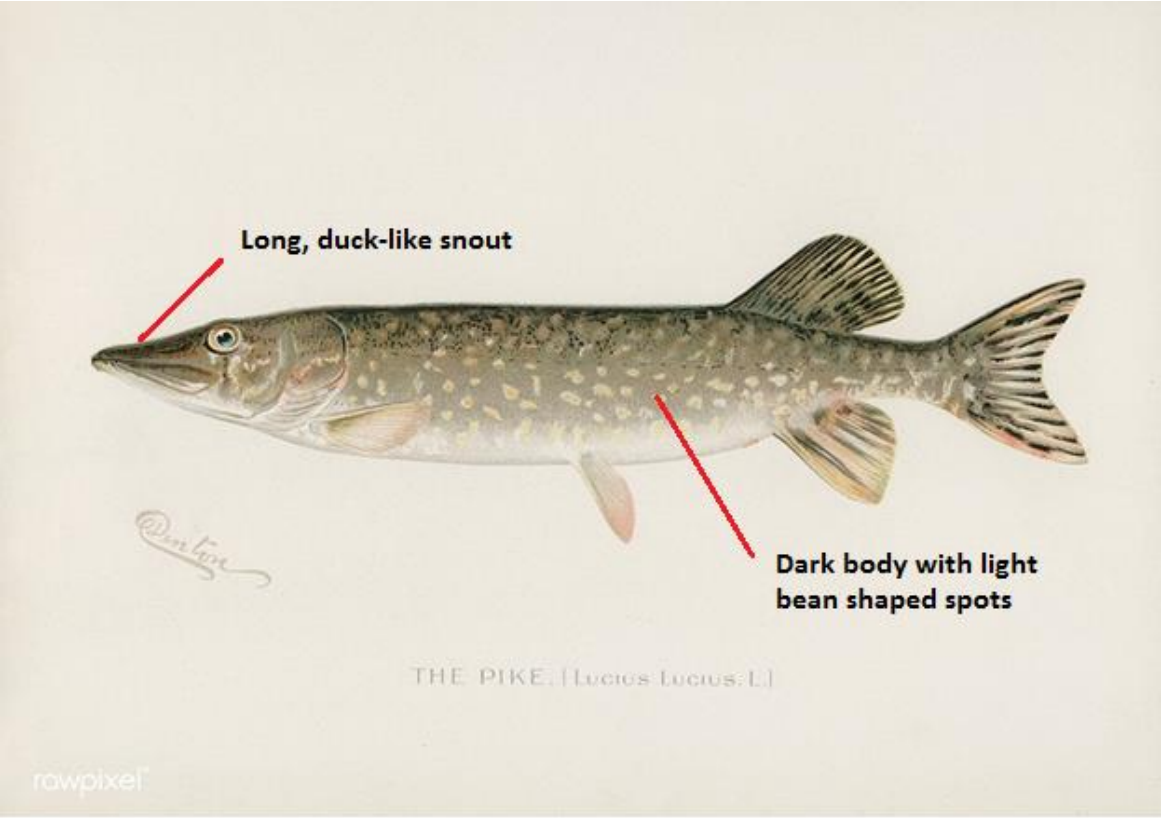


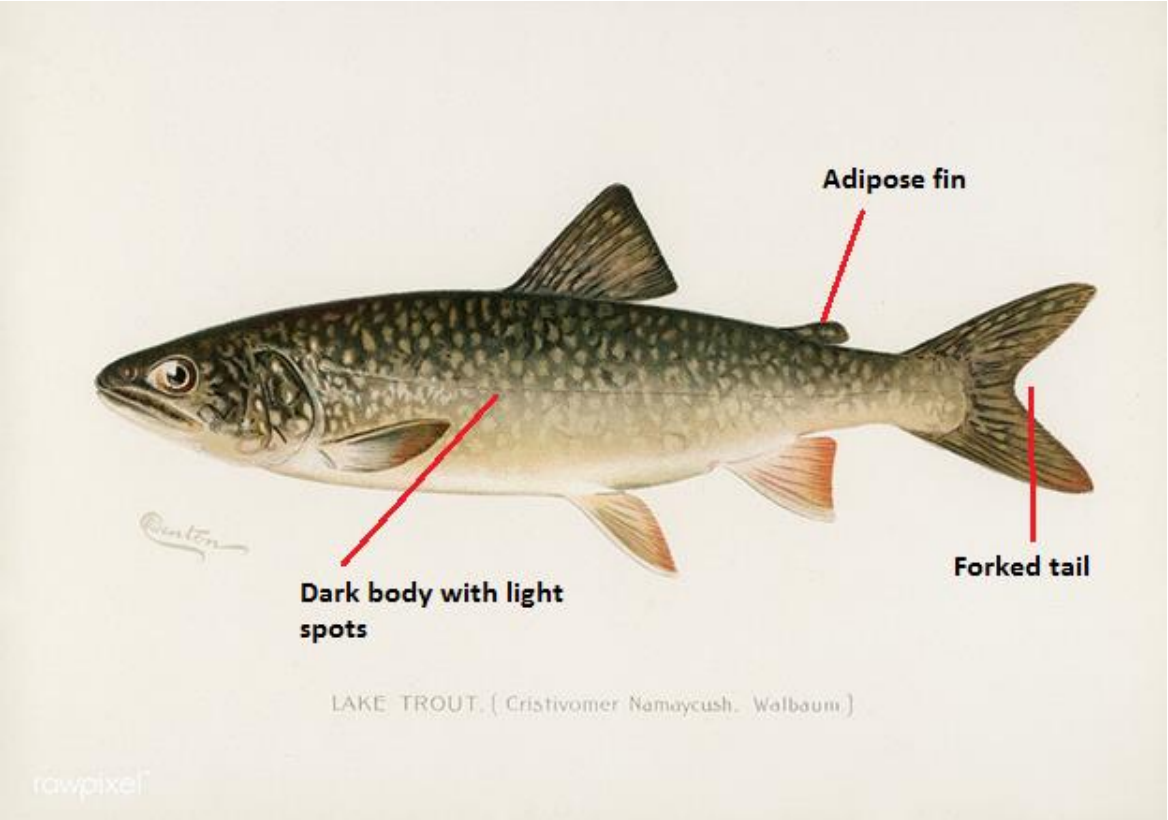
Some Basic Physical Characteristic Differences

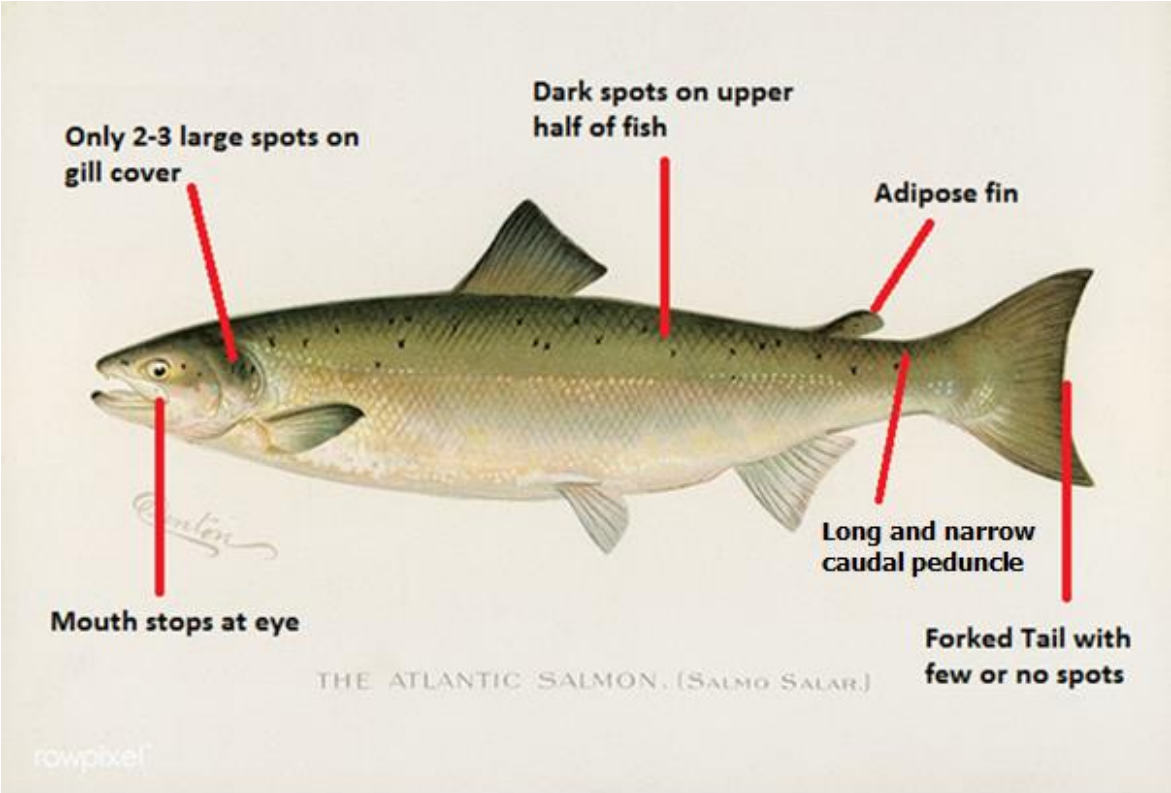




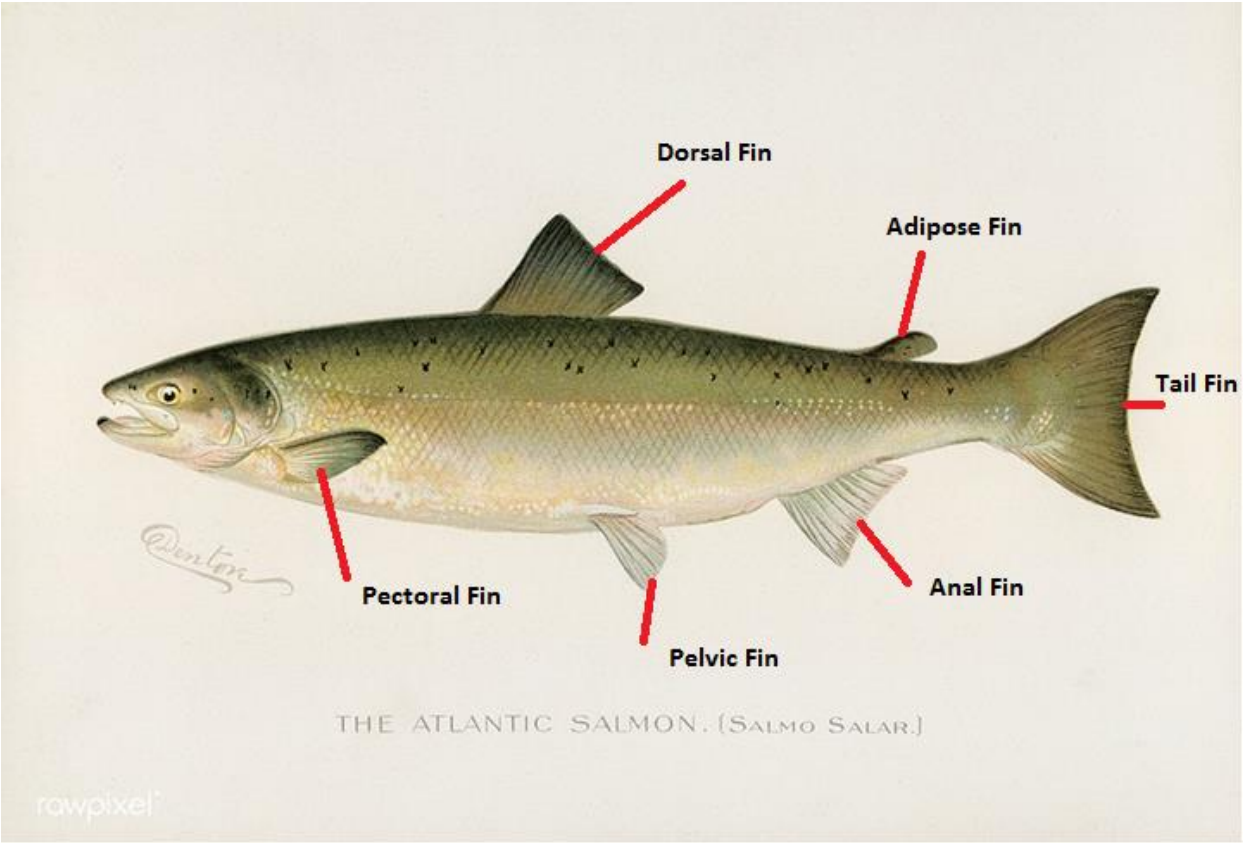

2 distinct dorsal fins
Dark bars
YELLOW OR BARRED PERCH.
(PERCA AMERICANA)
rawpixel


Long, duck-like snout
Dark body with light
bean shaped spots
THE PIKE. (Lucios Lucius. L.)
rawpixel


Adipose fin
Forked tail
Dark body with light spots
LAKE TROUT. (Cristivomer Namaycush. Walbaum.)

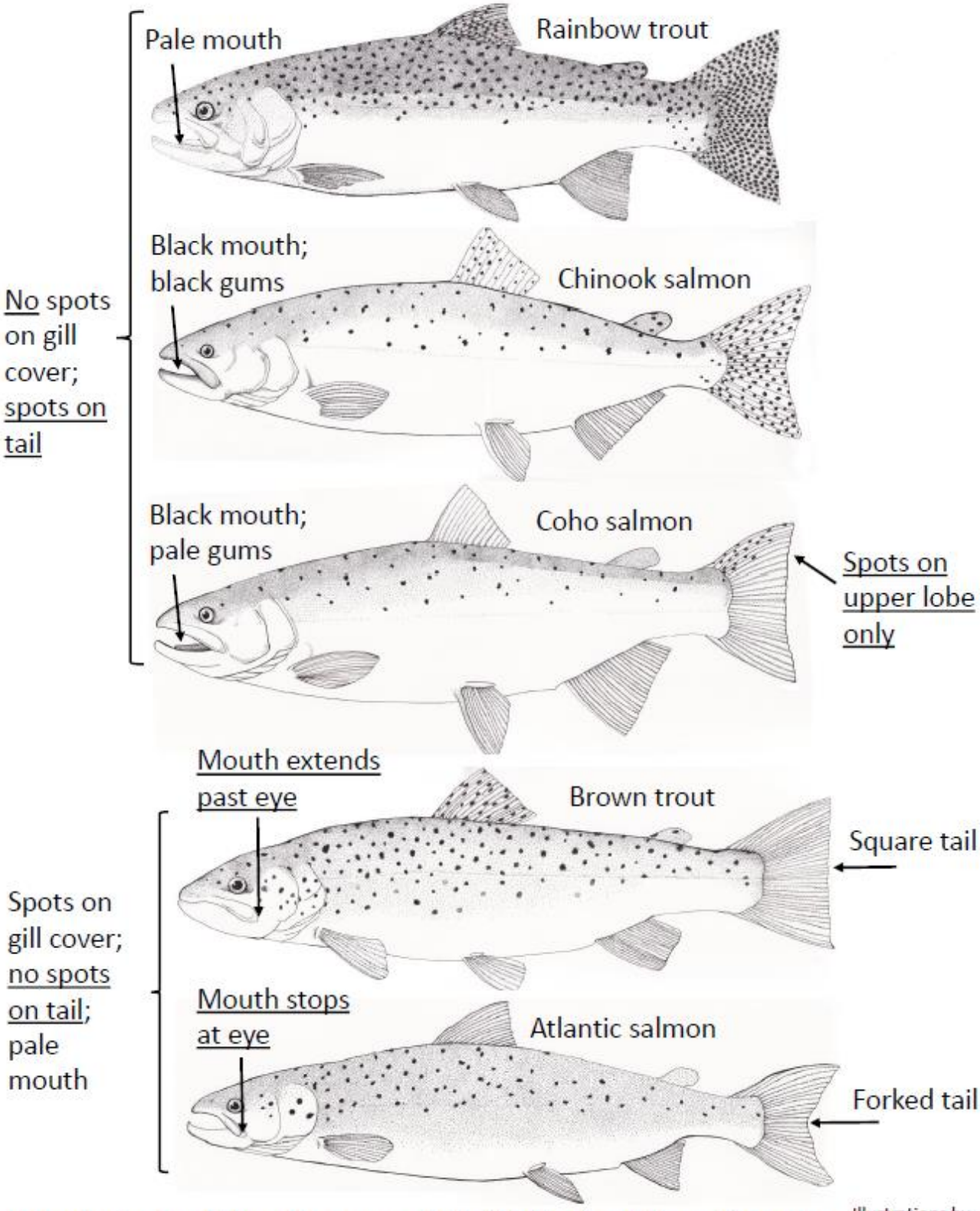

Dark spots on upper half of fish
Only 2-3 large spots on gill cover
Adipose fin
Long and narrow caudal peduncle
Mouth stops at eye
Forked Tail with few or no spots
THE ATLANTIC SALMON. (SALMO SALAR.)

Fins of a Salmon



Fish Illustrations from Game Birds and Fishes of North America; illustrated by Sherman F. Denton (1856–1937)

Fishing regulations differ among species! Make sure you can tell species apart.



www.bringbackthesalmon.ca info@bringbackthesalmon.ca

Illustrations by Natalie Pearson

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NAME THAT SALMON

Student Names_____
_____

Beside each fish write the species name and 3 identifying characteristics (e.g. has an adipose fin; no spots on the gill cover; black mouth with black gums).

Species Name: _____
Characteristics:
#1_____
#2_____
#3_____

Species Name: _____
Characteristics:
#1_____
#2_____
#3_____

Species Name: _____
Characteristics:
#1_____
#2_____
#3_____

Species Name: _____
Characteristics:
#1_____
#2_____
#3_____

Species Name: _____
Characteristics:
#1_____
#2_____
#3_____

ILLUSTRATIONS: CURTIS ATWATER www.natureartists.com/atwaterc.htm

Grade 3 Classroom Hatchery Activities

Lesson 6: Fish Need Trees

Lesson Objectives:

- Familiarize students with the habitat requirements of Atlantic Salmon;
- Introduce vocabulary relevant to Atlantic Salmon habitat;
- Introduce the idea of environmental stewardship;
- Have the students write a short and friendly letter.

Materials:

- Reading worksheet - printed 1 per student;
- Lined paper;
- Pencils and pens;
- Projector connected to computer.

Background:

Human activity has changed the world and some of these changes have resulted in severe ecological degradation. Deforestation, dams, pollution, and overfishing resulted in the extirpation of Atlantic Salmon from Lake Ontario. However, human activities are not only negative. With awareness and a desire to make things better we can restore the health and integrity of the world around us. This has many benefits not only for humans but also for the biodiversity that we share this planet with.

Environmental stewardship means taking care of the environment. Author and wildlife ecologist Aldo Leopold coined the phrase "land ethic" which states that humans have a moral responsibility to care for nature. Environmental stewardship and restoration ecology are critical pieces of the project to bring back the Atlantic Salmon. Ecologists look at the habitat that Atlantic Salmon require for survival and identify areas where habitat quality can be improved. Dams are removed or altered to allow fish passage, rock structures are returned, litter is removed, and trees and shrubs are planted in areas where the water is exposed to erosion, runoff, and excess sunlight (warming the water).

The letter writing assignment in this lesson looks at a golf course where the golf green is right up to the water's edge, causing warming of the water, erosion, and pollution impacts. Golf course greens, fairways, tees, and roughs are exempt from pesticide bans. These pesticides along with fertilizers can wash into the waterways. A buffer of trees, shrubs, and low vegetation can greatly minimize what gets washed into the water. This is a great place for a stewardship project! The golf course managers may or may not be aware of these impacts; either way, tactful communication and building a positive relationship is the preferred approach.

Teaching and Learning Sequence

Part A. Share this **Atlantic Salmon Fact:** *Atlantic Salmon first started to inhabit Lake Ontario 12,000years ago. Land changes caused by a few hundred years of European settlement caused them to disappear!*

Part B. Ask these **Guiding Questions** for the students to discuss as a group.

1. How do trees affect Atlantic Salmon?
2. Is there anything that you can do to help Atlantic Salmon?

Part C.

28. Print off the next page (Assignment 1) of this lesson and give a copy to each student;
29. Have the students either individually or as a group read "Salmon and Trees" and complete the word match;
30. Introduce the letter writing assignment and show the pictures below to give the students more context. Leave the assignment with the template displayed while they write their letters.

Part D. Ask these **Reflection Questions** and facilitate a group discussion

1. Is a healthy salmon habitat also good for humans? If so, how?
2. What other stewardship actions could students do to help Atlantic Salmon?

Assignment 1: Read ***Salmon and Trees***

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Match the word list with the meanings to help understand the reading.

Salmon and Trees

Atlantic Salmon depend on two distinctly different ***habitats***. As adults they live out in the big water (the ocean or a large lake) where they hunt fish and grow big. The adults will then ***migrate*** into ***tributaries*** for ***spawning***. The young fish hatch and spend the first few years of their lives eating aquatic ***invertebrates*** and hiding in rocks to avoid being food for other fish, large ***invertebrates***, birds, and mammals.

For these fish to survive, both habitats need to be healthy. The connection between thriving fish, healthy land, and healthy water is enormous. The area where land meets water is known as the ***riparian zone***. The riparian zone is very important for stream health. A riparian zone with abundant vegetation is referred to as a riparian buffer zone because it protects or buffers the stream from the impacts of the land use surrounding it. Plant roots stabilize the bank, reducing soil ***erosion***, and the canopy provides shade, which cools the water of ***tributaries***. Branches and leaves fall into the water and provide food for small animals like bugs (invertebrates) which are then food for the fish. The plants act as a filter stopping pollutants from entering the stream. Good riparian buffer zones reduce flooding as they slow the rate of runoff from rain into the stream. Riparian buffer zones provide habitat for otters, beavers, birds, and other animals that frequent steams. Atlantic Salmon need cool, clean water in streams and creeks for ***spawning*** and for the growth of the juvenile fish.

Word Match

A. **Migrate**			*wearing away*
B. **Tributaries**			*animals without backbones*
C. **Habitat**			*an area where land and water meet*
D. **Spawning**			*the job of taking care of something such as the environment*
E. **Invertebrates**			*an organism's natural home*
F. **Stewardship**		**A**	*to move from one part, region, or habitat to another*
G. **Erosion**			*the process of depositing and fertilizing eggs*
H. **Riparian zone**			*rivers and streams that feed into a larger body of water*

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Assignment 2: Letter Writing

You are hosting an event called "Fish Need Trees" and are looking for a spot on {use the name of your release stream} where you along with members from your nature group can improve habitat by planting trees and shrubs. You see that at "Whispering Salmon Golf and Country Club" there is an area that has no tree cover.

Write a short letter to the manager Mrs. Fairway asking if she would consider your project at the golf course. Make sure that your letter is friendly and has tact (understanding, sensitivity, and respect). Tell her that the project will benefit water quality, wildlife habitat (including for Atlantic Salmon), reduce erosion, and look nice. Tell her you would like to plant cedars, dogwood, and maple trees. Ask her if she would be willing to talk about the project further. Make up a 10 digit phone number to give her.

Letter template. Write the letter on lined paper.

Date

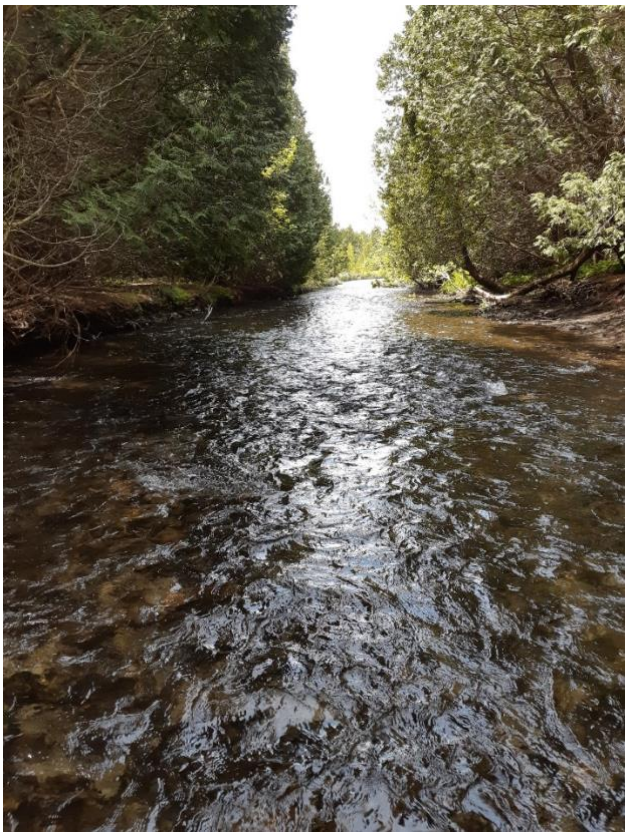
Dear_____

My name is_____. I am writing you today to {tell her about the project and ask if she is interested}

Sincerely,

{Your Name}

{Your made up phone number}



Example 1: Good habitat

Example 2: Stewardship in action: Students planting trees and shrubs

Examples 3 and 4

- Which looks like better habitat?
- Where could we improve habitat?

Grade 4 Classroom Hatchery Activities

Lesson 7 Stream Habitat Mural

As adapted from Trout in the classroom

Objectives:

Create a habitat mural showing how the sun and the plants helps help an aquatic habitat be health and supports the food web of animals that live in a stream habitat, including the Atlantic salmon. As a whole class, the students will create a decorative backdrop that can be attached to the outside of the insulating foam of the Atlantic salmon classroom aquarium.

Materials:

-Post it notes (a few post-its each student)

-Large chart paper or whiteboard

-Watercolour paints, papers and brushes

-Scissors and glue

-Decorative collage or textured paper

-Construction paper

-Recycled paper scraps

-Large poster paper cut to the size of the aquarium

-Additional art supplies is available (special paper, etc.)

Background

Clean cold streams provide an ideal habitat for Atlantic salmon. The health of a stream depends on many factors including vegetation, surrounding land, forested cover and substrate. A healthy stream has many important parts. First, it has a partially to fully rocky substrate (stream bed), such as gravel or boulders. As the cool water flows, it meanders (weaves back and forth) over and around this substrate. A pattern of rocks and gravel makes the water act differently in different parts of the stream. Sometimes, the water pools in flatter, calmer areas and the water flow slows. In other areas, the highly variable substrate creates riffles- the areas of bubbly, white water- that help oxygenate the water. When water flows quickly without interruption by substrate, this is a run.

A healthy stream also holds and is bordered by many living things. Aquatic macroinvertebrates, such as insects, mollusks, and crustaceans, live in every level of the water column. Fish and plants also live within the stream. A healthy riparian zone- the area next to the stream- must also be full of life. A healthy riparian zone has trees, shrubs, and/or herbaceous plants, as well as animal wildlife. This riparian zone (the roots and

debris) helps filter surface water runoff and groundwater that might carry sediments and other pollutants that would otherwise enter the stream.

Procedure

1. On the large chart or whiteboard, write down the following question: *A stream is a type of habitat that is important. What are the parts that you would see and hear when you visit a healthy stream?*
2. Provide each student with a few post-its and ask them to write out 1 idea per post-it note of the parts that make a stream habitat healthy.
3. Provide students 5 minutes to complete their responses. Once the students have completed their reflections and connections on the post-its, ask them to place their post it notes onto the whiteboard or display chart. On the whiteboard or chart paper, create a chart that outlines features of a stream, animals and plants found at a stream. For this portion of the activity only 3 parts of the chart will be completed.

Providing students with the opportunity to share what their responses were, students will place their post-it under the proper heading. This 10-15 minute activity will encourage students to think about the components of a healthy stream

Features of a stream	**Animals present at a stream**	**Plants present at a stream**	**Atlantic salmon's prey**	**Atlantic salmon's predators**

4. Following the discussion of the healthy parts of a stream, discuss with students Atlantic salmon habitat. Let students know that they will create a background for the Atlantic salmon aquarium to prepare them for their freshwater home when they are released. Use the following prompts to begin brainstorming ideas:

-*What are the Atlantic salmon's prey?*

-*What are the Atlantic salmon's predators?*

Record the student's responses on the chart paper or whiteboard table that has been created as a class.

5. **Begin creating aquarium backdrop:** Not all students are familiar with techniques that artists use when working with watercolour. One aspect of the Atlantic salmon collage is the background material and colour that can represent the water. Watercolour paper and watercolour paint are natural media to use to represent this. Give every student the opportunity to try out creating the freshwater background and explain that the class will vote on what colours will ultimately be used to make the class collage. Model the technique of wetting both sides of the watercolour paper with a brush before painting water patterns on one

side of the sheet. When you wet one side, the paper rolls up toward you like arms stretching, by wetting the other side you will be able to get a flat surface. (This process is also known as "waking up the paper."). Preparing the paper in this way also give the flowing sensation often seen in watercolour paintings. Students are then ready to choose the colours to imitate the look and feel of a freshwater stream or river.

6. While the backdrop dies after watercolour painting has been completed, students will create their own living and nonliving shapes for the habitat collage using recycled paper, construction paper or additional art materials that are available.

7. Once the watercolour backdrop has dried and the students have created their plants and animals for the stream habitat, lay the large watercolour paper out in a large flat surface in the classroom. Students will place their pieces on the stream background where they want them. Discuss what could be added to fill the scene and choose volunteers to create these additional elements or allot time for students to create a few remaining items to complete the masterpiece.

8. Once all pieces have been completed and there are no large open spaces and the background is nicely covered with plants and animal paper elements, glue down the pieces- students can glue their pieces or you can glue the pieces onto the backdrop and install the background using tape and affixing it on the <u>outside</u> of the insulation that is attached to the tank. This paper masterpiece will decorate the outside of the classroom aquarium rather than having solely the insulation on the outside of the tank. You can still have one side of the decorated insulation pieces open and close for viewing inside the tank. Be sure to attach the masterpiece on the <u>outside</u> of the aquarium tank and affix it on the sheets of hard foam insulation, rather than directly against or on the glass, as with the creation and presence of condensation on the glass, it will destroy the art piece if affixed directly onto the tank and not attached to the foam insulation pieces.

Grade 4 Classroom Hatchery Activities

Lesson 8: Stream Habitat Dioramas

As adapted from Trout in the Classroom

Read aloud source: *Salmon Boy*: pg. 95-97 *Keepers of the Animals*

Objectives:

Through an interactive hands-on activity, students create their own stream diorama's that show the key elements of a healthy stream. Students will learn of the importance of Atlantic salmon in a variety cultures including their own and the Haida through the read aloud activity of the Haida legend *Salmon Boy* as well as become familiar with vocabulary that will be used throughout this unit of study.

Materials:

-Salmon Boy Haida legend read aloud story (attached)

-Images of healthy Atlantic salmon streams

-Shoeboxes or other small boxes

-Construction paper

-Glue; glue sticks

-Saran wrap

-Clay

-Natural materials such as sticks, rocks, leaves, small plants, etc.

-Gravel

-Computers (if conducting research on elements of healthy stream habitats)

Background

The clean cold streams provide an ideal habitat for Atlantic Salmon. The health of a stream depends on many factors including vegetation, surrounding land, forested cover and substrate.

A healthy stream has many important parts. First, it has a partially to fully rocky substrate (stream bed), such as gravel or boulders. As the cool water flows, it meanders (weaves back and forth) over and around the substrate. The pattern of rocks and gravel makes the water act differently in different parts of the

stream. Sometime, the water pools in flatter, calmer areas and the water flow slows. In other areas, the highly variable substrate creates riffles- the areas of bubbly, white water- that help oxygenate the water. When water flows quickly without interruption by substrate, this is a run.

A healthy stream also holds and is bordered by many living things. Aquatic macroinvertebrates, such as insects, mollusks, and crustaceans, live in every level of the water column. Fish and plants also live within the stream. Then, the riparian zones- the area next to the stream- must also be full of life. A healthy riparian zone has trees, shrubs, and/or herbaceous plants, as well as animal wildlife. This riparian zone (the roots and debris) helps filter surface water runoff and groundwater that might carry sediments and other pollutants that would otherwise enter the stream.

The story Salmon Boy which has been included in this activity is an allegory of great importance, revealing a series of interlocking circles, which as the story proceeds, run progressively deeper into the life ways of the Haida. Even though the people catch and eat the salmon, they do so with respect and gratitude. When the people live in balance and treat the spirits well the salmon swim upstream and offer their bodies for food. By returning the bones and all they do not eat to the water this *circle of giving and receiving* remain intact- the gift keeps moving. There is an important, interdependent relationship here: the salmon give people food and the people show their appreciation through prayer and reverence.

The salmon take notice when the boy begins to live out of balance by being disrespectful and breaking the circle. Yet, the salmon do not react by getting angry and harming the boy. He is made one of them so that he may more fully understand who they are and how to care for and respect them. Even though he drowns and dies to his own people, Salmon Boy has a new life among the Salmon people at their home in the ocean. We see the great *circle of life and death* and the reality of the spirit world. Then, in another circle, one of transformation. Salmon Boy returns to his people as a healer to teach them the ways of the Salmon People and to help them when they are sick. This event in the story reveals the Native American's deep sense of *interconnectedness* between this world and the spirit world, and between animals and people.

Finally, after downing and finding a new life first among the salmon and then again with his own people, Salmon Boy spears his own salmon soul and his human self dies. When his body is placed into the river it circles *four times*- a sacred number- and returns again to life among the Salmon People.

Just as the salmon in this story represent a link between the ordinary world and the spirit world, they also connect us to their mysterious home under the sea. It is believed that salmon once lived only in fresh water, but at some point in their history began to migrate to the sea where food is plentiful.

The salmon in the story "Salmon Boy" are *anadromous* species that live and grow in salt water, then return to ancestral freshwater spawning grounds when mature.

Salmon travel immense distances on their life's migration to the sea and back. No one knows for sure how the salmon navigate to make their epic migrations. They may follow the sun, moon or starts. Some hypothesize that they orient according to salinity, temperature, the unique odour and chemistry of water in

their home streams or from some primal memory of how to reach home to spawn just through random migration toward the general coastal area.

Once in their home river systems salmon demonstrate an intense desire to move upstream-leaping up to 10 feet (3.0 metres) high over waterfalls and rapids.

As in the story "Salmon Boy", people still fish for salmon as well as many other species. Those who remember the traditional ways still maintain a close, respectful relationship with the Fish People. Fishhooks and spears have largely supplanted by a high technology fishing industry that uses computers, planes and echo sounders to locate fish, and an array of nets and highly effective catching devices. A modern fishing fleet often consists of a mother ship, spotters, catchers and factory processing ships where the catch is gutted, cleaned and frozen, all while at sea. Some species have been so over-fished that they have become scarce and can no longer be used as food.

Salmon and other fish face many other threats to their well-being besides extreme angling pressures. Dams present obstacles that block migration upstream. Water pollution stresses and weakens the health of migrating fish and masks the natural odours by which salmon recognize their home streams on the return spawning runs. Severe water pollution along a stretch of river can create zones that are so deadly to fish that they cannot be traversed and so act as barriers to migration. Polluted water can adversely affect the development of fish eggs and young as well as change in temperature due to deforestation near streams will affect the healthy Atlantic salmon habitat.

Fortunately, over time, some of the dams that once blocked the flow of many rivers are being fitted with fish passages such as fish ladders. There is also continued efforts made for stream restoration that can return to supporting a healthy habitat for Atlantic salmon to live in.

Procedure

1. Read aloud the Haida legend: *Salmon Boy* (attached). Provide students with a brief understanding of what a legend is as well as an overview of First nations heritage and the Haida. Following the reading of the legend, ask students some of the following comprehension questions:

-*What do the salmon do when the young boy treats them disrespectfully? What would you have done? Why do the salmon make the boy one of their own?*

- *How is the young boy changed by his experience? What does he learn?*

-*Do you eat fish? How do people catch the fish that your family buys? What is happening to the populations of fish as such great numbers of them are caught? What other factors can limit the Atlantic salmon to continue living in Ontario streams and having healthy habitats? What are some key things that are important in a healthy habitat for fish like the Atlantic salmon?*

2. Share Atlantic salmon steam images and vocabulary with the students, using magazines, books or the internet.

3. Ask the students to imagine, in their minds' eyes, the perfect Atlantic salmon stream. What is in the stream? What is the shape of the stream's path? What grows next to the stream? What are the best salmon hiding spots?

4. Providing each student with a shoebox, in their shoeboxes, ask students to describe and portray their "dream stream" path, using a pencil. This is a good start to help them plan out every other key element for their own healthy Atlantic salmon stream diorama.

5. Provide ample time and allowance for the students to use art and/or found materials (craft materials or natural materials). Students can use anything they brought or found as well as share with their peers. Gravel makes great substrate. Sticks with leaves of paper make excellent tress, and stand up well in little balls of clay. As a final touch, the saran wrap can be used to depict the stream water.

6. In small groups or as a class, ask students to share their dream streams with each other. Provide time for a gallery walk for students to view their peers stream dioramas.

Salmon Boy

(Haida legend-Pacific Northwest)

Source: *Keepers of the Animals*

Michale J.Caduto and Joseph Bruchac

Pages 95- 96

Long ago, among the Haida people, there was a boy who showed no respect for the salmon. Though the salmon meant life for the people, he was not respectful for the one his people called Swimmer. His parents told him to show gratitude and behave properly, but he did not listen. When fishing he would step on the bodies of the salmon that were caught and after eating he carelessly threw the bones of the fish into the bushes. Others warned him that the spirits of the salmon were not pleased by such behaviour, but he did not listen.

One day, his mother served him a meal of salmon. He looked at it with disgust. "This is moldy," he said, though the meat was good. He threw it upon the ground. Then he went down to the river to swim with the other children. However, as he was swimming, a current caught him and pulled him away from the others. It swept him into the deepest water and he could not swim strongly enough to escape from it. He sank into the river and drowned.

There, deep in the river, the Salmon People took him with them. They were returning back to the ocean without their bodies. They had left their bodies behind for the humans and the animal people to use as food. The boy went with them, for he now belonged to the salmon.

When they reached their home in the ocean, they looked just like human begins. Their village there in the ocean looked much like his own home and he could hear the sound of children playing in the stream which flowed behind the village. Now the Salmon People began to teach him. He was hungry and they told him to go to the stream and catch one of their children, who were salmon swimming in the stream. However, he was told, he must be respectful and after eating return all the bones and everything he did not intend to eat

to the water. Then, he was told, their child would be able to come back to life. But if the bones were not returned to the water, that salmon child could not come back.

He did as he was told, but one day after he had eaten, when it came time for the children to come up to the village from the stream, he heard one of crying. He went to see what was wrong. The child was limping because one of its feet was gone. Then the boy realized he had not thrown all of the fins back into the stream. He quickly found the one fin he had missed, threw it in and the child was healed.

After he had spent the winter with the Salmon People, it again was spring and time for them to return to the rivers. The boy swam with them, for he belonged to the Salmon People now. When they swam past his village, his own mother caught him in her net. When she pulled him from the water, even though he was in the shape of a salmon, she saw the copper necklace he was wearing. It was the same necklace she had given her son. She carried Salmon Boy carefully back home. She spoke to him and held him and gradually he began to shed his salmon skin. First his head emerged. Then, after eight days, he shed all of the skin and was a human again.

Salmon Boy taught the people all the things he had learned. He was a healer now and helped them when they were sick.

“I cannot stay with you long,” he said, “you must remember what I teach you.” He remained with the people until the time came when the old salmon who had gone upstream and not been caught by the humans or the animal people came drifting back down toward the sea. As Salmon Boy stood by the water, he saw a huge old salmon floating down toward him. It was so worn by its journey that he could see through its sides. He recognized it as his own soul and he thrust his spear into it. As soon as he did so, he died.

Then the people of the village did as he had told them to do. They placed his body into the river. It circled four times and then sank, going back to his home in the ocean, back to the Salmon People.

Chiin Sgáanuwaay ~ Supernatural Salmon by Haida Artist April White

Grade 4 Classroom Hatchery Activities

Lesson 9: Eroding Homes

As adapted from Discovery Education- Erosion Rates

Objectives:
Students will conduct simple investigations to collect data on erosion rates of different Earth materials (waves, wind, water, glaciers). Students will be able to recognize that waves, wind, water and glaciers all break rock and soil into smaller particles and move them around and rank their investigations to evaluate the most efficient agent of erosion.

Materials:
- Small tray
- Cup of water
- Aluminum baking pan
- Sand
- Water
- Metric ruler
- Piece of cardboard
- Drinking straw
- Ice cube
- Modeling clay
- Meter stick
- Soil
- Dropper
- Station cards (attached)
- Student observation response sheets (attached)
- Frayer vocab sheet (attached)
- Smartboard or large whiteboard with Frayer vocab diagram illustrated x3

Background
Earth is always changing. New mountains, lakes and rivers are being made, and old ones are disappearing. Internal and external forces cause changes on Earth. Sometimes the changes are fast, and sometimes the changes are slow. Erosion, weathering, and glaciation are due to slow processes while hurricanes, flooding, landslides, and volcanoes are quick processes. Gravity is the natural force that causes changes in Earth's surface features. The major agent erosion is running water as it has had the largest impact on Earth's land surface. Erosion is different from weathering because weathering is the process that breaks down rock and other substances at the Earth's surface while erosion is the movement of rock particles by water and wind.

Preparation
Before students arrive, print station cards and make enough copies of the student observation response sheets. Materials should be arranged at each station ready to be used prior to students coming into the class. Depending on your class size, you might want to provide multiple setups of each station.

For the warm-up activity, have sand in trays prepared and cups of water off to the side of the classroom. Prepare enough for pairs of students.

Procedure
Warm-up Activity

1. Provide students with a small amount of sand, a small tray, safety googles, and cup of water. Challenge them to move the sand from one end of the tray to the other using as many different methods as they can. Students should record their methods and share with the class. One method for example might be blowing the sand it is important students wear safety goggles while investigating.

Ask students to identify the processes they are demonstrating. At this point, students are likely to give very general/common descriptions of the processes. They might use terms such as blowing, pushing, and rolling. Students should be prompted to use the term erosion by clarifying erosion is process in which water, ice, or wind move pieces of rock and soil.

2. As a whole class, guide students to define the terms erosion, sediment and gravity. Provide each student with their own copy of the Frayer model (x 3) and have them complete their own copy using the information from the class model. On the Smartboard or Whiteboard, begin by writing the definition in the middle oval and fill out the four sections. Students will copy the information as it is creating and lead by the staff. The following terms that will be of focus are: ***erosion***, ***sediment*** and ***gravity***. These terms will be used frequently throughout the lesson.
3. Explain that there are four stations around the room that investigate systems that impact Earth's surface. They will be observing that all stations demonstrate a different agent of erosion and its effect on Earth's surface. Allot for 5 minutes at each station for 4 students in pairs to conduct each experiment. (providing multiples of each station will accommodate larger class numbers)

Station #1: **Waves**
Materials: aluminum baking pan, sand, water, metric ruler, and piece of cardboard
Students will build a small hill on one side of a tray with sand. On the other end, they will pour a cup of water. Students will create different sized waves using the piece of cardboard. Ask students to observe how the sand moves. Students will observe the sand being carried into the water and back onto the sand pile.

Station #2: **Wind**
Materials: aluminum baking pan, cornmeal or sand, and drinking straw
Students cover the pan with a layer of sand or cornmeal 1-2 cm. thick. They will use a straw to gently blow over the layer of sediment. Ask students to observe how the sand moves. Students will observe the sand or sediment being carried by their breath of air and being dropped down after they stop blowing. Students might use the term gravity to explain how the sediment dropped.

Station #3: **Glaciers**
Materials: Ice cube, modelling clay, sand, cardboard
Students slide an ice cube over the clay and sand. They then leave the ice cube to melt at the end of the path. Ask students to observe how the sand moves. Students will observe the ice picking up particles of sand and that they are making a path. Where the ice melts they will observe the sand making a small pile.

Station #4: **Water**
Materials: Petri dish, soil, water, pipette, meter stick
Students will fill a petri dish with 1 cm. of soil. They will place the dish on a paper and fill a dropper with water. Students will squeeze a large water drop from a height of 1 m. onto the surface of the soil. They will measure the distance the soil splashed from the dish. They will repeat these steps at a height of 2 m. Ask students to observe how the dirt moves. Students will observe that the greater height the soil splashed further. The splash caused the sediment to move from one place to another.

4. As a whole class, encourage students to discuss with their elbow partners and debate a ranking of most efficient agent of erosion to the least efficient based on their observations. Ask students to consider the amount of sediment that was moved from one place to another. More sediment moved is evidence of a more efficient method.
5. Following the elbow-partner discussion, share with students that human activities can also affect the Earth's surface. Ask students to consider how erosion is impact when you plant trees on Earth's surface. Deforestation is the process of removing all the trees and vegetation. How could this process impact erosion?

(Students will identify that by planting trees you can stop sediment from moving. Trees slow down water as it runs and the roots can use the water. If trees are removed, sediment can continue to move freely.)

Ask students how erosion and deforestation can affect a shoreline and ask how eroding shorelines can cause unhealthy habitats for fish, such as Atlantic Salmon.

(*Deforestation will cause the water temperature to change that will impact the aquatic life that is in the stream including Atlantic salmon. Atlantic salmon require cold and clear water in their streams for a healthy habitat and for their eggs to be able to survive and not suffocate in muddy water. With mud and silt, finding the appropriate nutrition, a safe area for eggs to hatch, and cold water temperatures, fish like the Atlantic salmon would be required to find an alternate healthy habitat that could better meet their needs.)*

Station Cards

Waves
Wind
Glaciers
Water

** Provide each station with 1 copy per student of each card after cutting them out

Name:_____

Waves

Waves carry sand and other materials. As waves move over land, they drop off the materials they carry. As waves hit the shore, they break down rocks and other materials into small pieces. Erosion is the movement of pieces from one place to another.

Do large waves erode MORE than small waves?

1. Build a small sand hill on one side of the pan
2. Add water and make waves with the small piece of cardboard
3. Make small waves and then large waves
4. What did you notice about the size of waves and erosion?

_____

_____

Name:_____

Wind

Wind shapes the land in place where there are few plants to hold the soil in place. Wind carries sand that can grind down other rock. Wind carries sand and drops it creating hills, like sand dunes.

How does moving air affect sediment?

1. Cove the bottom of a pan with a layer of cornmeal or sand (1-2 cm. deep)
2. Gently blow over the layer of sediment (cornmeal or sand) using a straw to direct your breath. Observe what happens.
3. What changes did the wind you created make in the flat layer of sediment?

_____

_____

Name:_____

Glaciers

Glaciers can form only in an area where more snow falls than it can melt. The movement of a glacier changes the land beneath it. They move slowly and can pick up rocks and dirt as they move. These sediments can scrape against the land as it flows with the glacier. When a glacier melts it will drop the sediments creating new landforms.

How do glaciers affect sediment?

1. There is a modeled landscape made out of clay with sand at your station, sprinkle with extra sand it needed.
2. Slide an ice cube over the clay and sand.
3. Leave the ice cube to melt at the end of the path.
4. Write a description of how the sand moved.

_____

_____

Name:_____

Water Erosion

Water in all forms can cause erosion. Raindrops splash moving particles of soil. In streams, water moves picking up and dropping sediment.

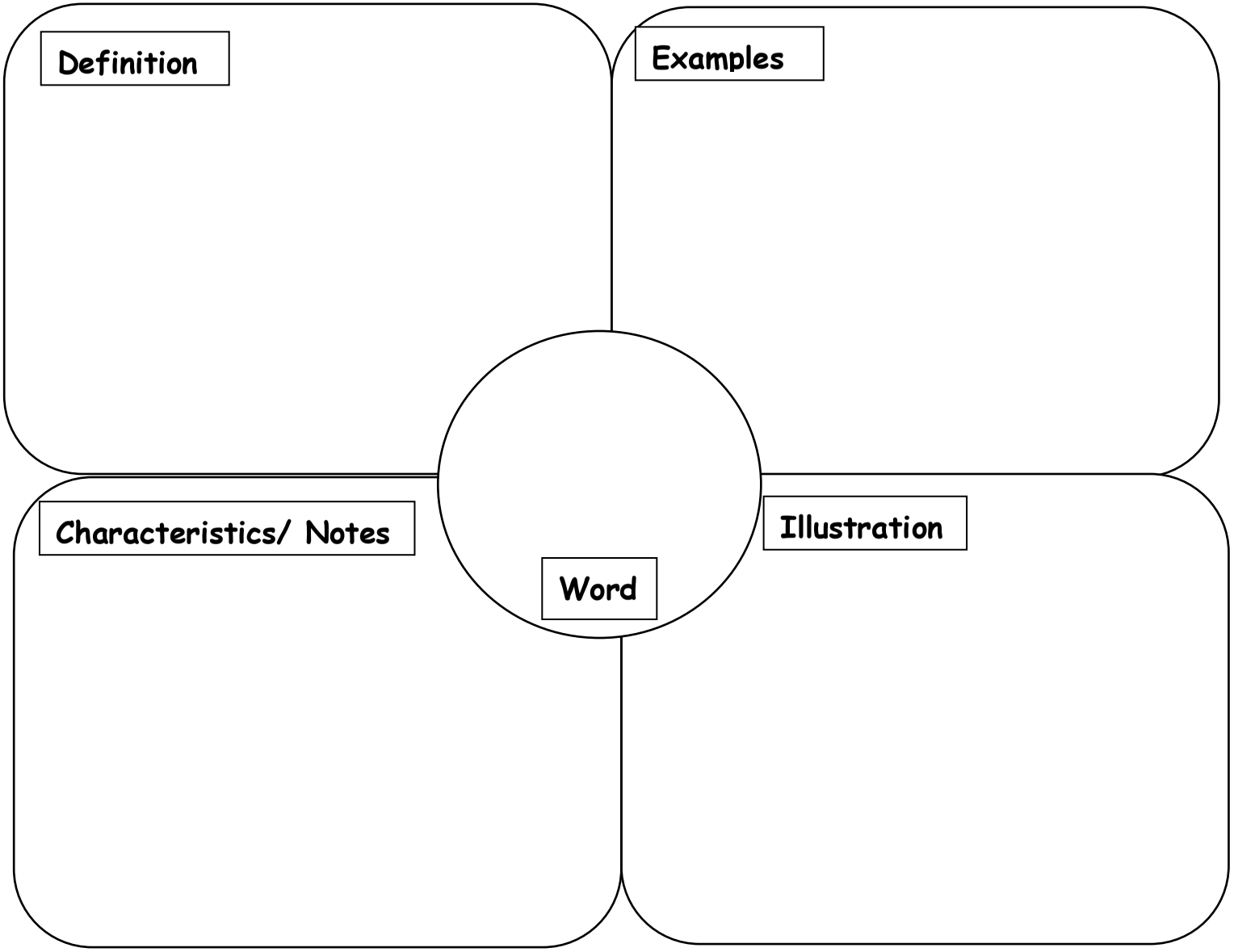
How does the force of falling raindrops affect soil?

1. Fill a Petri dish with fine textures soil to a depth of about 1 cm. Make sure the soil is flat but not hardly packed.
2. Place the dish on paper.
3. Fill a dropper with water. Squeeze a large water drop from a height of 1 m. onto the surface of the soil. Repeat 4 times.
4. Use a meter stick to measure the distance the soil splashed from the dish.
5. Repeat steps 1 through 4, this time from a height of 2 m.
6. Which travelled further, the splash from 1 m. or the splash from 2m?
7. Which test produced the greater amount of erosion? Why?

_____

_____

Frayer Vocab Model



Classroom Hatchery Activities

Lesson 10 Salmon Migration

As adapted from American River Salmon Festival Schools

Objectives:
Through a hands-on interactive mathematical board game students will describe the seasonal migration of anadromous fish, like the Atlantic salmon and identify a variety of natural and human factors that affect the reproductive success of Atlantic salmon and apply mathematical skill to biological problems.

Materials:
-Atlantic salmon life cycle (attached)
For each group of 2-4 players:
-Game board (attached)
-*Salmon Migration* worksheets to keep score (double sided)
-sets of cards (make a set of cards for each 4 players)
- a die
-2-4 salmon or other counters for players to move
-storage box, such as a shirt box
-vocab sheets
-calculator (optional)
-Whiteboard or chart paper

Background
Migration is the movement of animals from one area to another. Many species migrate seasonally. In this activity, salmon seasonally migrate from the open ocean through estuaries and into freshwater rivers and streams where they spawn (lay their eggs). The newly hatched young must them migrate back down the rivers to the ocean. Fish that follow this pattern are said to be anadromous from the Greek word for "running upward". Both the adults and the young face a number of hazards, some natural and some from humans. As the students play this game, they will learn about these hazards.

Preparation

1. Print and cut out the game board and game cards. For repeated use, laminate game pieces. Copy the cards and glue to different colours of construction paper. Copy the worksheet.

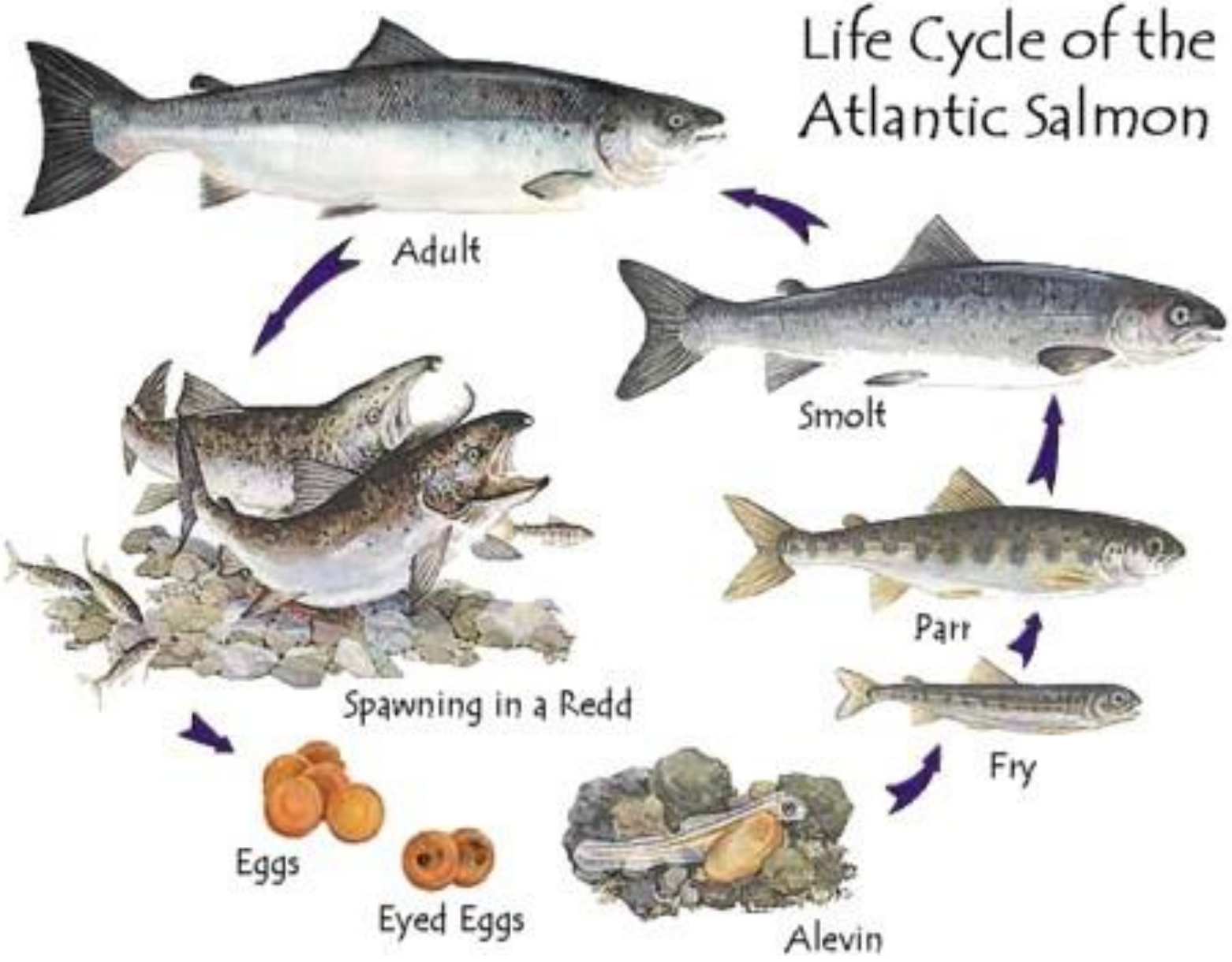
Procedure

1. Ask students what they know about migration. Have students name animals that migrate.

Some questions you can ask include:
-*Why do animals seasonally migrate?*
-*Is it climatic changes that affect food supply and reproductive potential?* Example, Canadian geese migrate each spring to breed in the northern U.S. and Canada, and then migrate south each fall to winter feeding grounds in the southern regions of the United States. *What about fish?*
2. Review the life cycle of the salmon- you can use the attached handout.
3. Introduce the Salmon Migration Game. In this game, students will be salmon migrating from the ocean (where they feed and grow into adults) into rivers and creeks to spawn and release eggs, which are fertilized outside the female's body.

4. Have the students predict some of the hazards they are likely to encounter during their migration. Make a list of the predictions on the whiteboard or chart paper.
5. The students will keep track of their population size on worksheets. Graph the decline of fish as they swim upriver and the decrease of offspring as they swim down to feeding grounds in the sea.
6. Following the game, review with the students, and update the list of hazards they encountered while playing the game.
Enquire if they included:
-predation by a wide variety of predators
-food supplies
-changes in water level from lack of rainfall
-abnormal temperatures
-unusually severe storms
-parasites and diseases
-water pollution
-sediment from runoff
-obstructions to migration such as dams
-fishing
7. Ask students: *Which of these hazards are natural and which are a result of humans?* Discuss the fact that even if humans were completely out of the picture, far more salmon are spawned than will ever survive to reproduce. Each species of animal or plant is capable of producing more offspring than are needed to just replace the individuals already alive. This allows species to survive predation and recover from natural changes or disasters. It also means that when natural controls, such as predators, are removed, populations may explode in size.

Life Cycle of the Atlantic Salmon



Salmon Migration Game Sheet

You have a run of salmon trying to reach the spawning grounds. There are 1,000 fish in this run. There are many dangers ahead. Each time you meet a hazard, subtract the number of fish that died. Use this chart to keep track of your fish population.

Ocean	Estuary	Streams

The number of adult fish that reached the spawning ground is: _____

How many alevin (sac fry) were produced? Calculate as follows:

1. Roll the die. Your number was:_____

2. Multiply this times 10 _____ x _____ = _____

3. Multiply this number by the total number of adult fish to get the

number of baby salmon that start downstream:_____

Now the fingerling/fry salmon head for the ocean. Keep track of the changes in the number of fish as they swim.

Ocean	Estuary	Streams

The number of young salmon that reached the ocean is:_____

The average number of young salmon that reached the ocean for the group playing the game: Add all young together and divide ÷ by the

number of players: _____

Are the total number of salmon increasing each year or decreasing?

_____

_____

If you were a fisheries biologist, what actions would you take which could increase the number of salmon in future years?

_____

_____

START HERE
Ocean Card
Ocean Card
Ocean Card
Ocean Card
Ocean Card
Ocean Card
Ocean Card
Ocean Card
Stream Card
Stream Card
Stream Card
Stream Card
Stream Card
Stream Card
Stream Card
Estuary Card
Estuary Card
Estuary Card
Estuary Card
Estuary Card
Estuary Card
Estuary Card
Estuary Card
SPAWNING GROUNDS

Game Rules

Goal:

You are a salmon, and you are to produce as many offspring as possible by successfully swimming to the spawning grounds. After the spawning and hatching of young salmon, the fingerlings/fry swim back to the ocean. The player with the most fingerlings/fry making it to the ocean wins! But beware, there are many hazards lurking along the way.

How to play:

1. Shuffle the hazards card sets and place them beside the game board where they are easy to access for when you have to pick up a card.
2. Select your marker or counter and place it in the Open Ocean (START HERE). From the ocean you will swim into the estuary and then upstream to spawn. Young salmon then swim back to the ocean.
3. To start you have 1,000 salmon; record this number on the worksheet.
4. Roll the die. The highest number starts first. Play continues clockwise around the table.
5. Roll the die to determine the number of spaces to move. If you land on a space instructing you to draw a card, do so and read it aloud. Record the change in the number of fish on your worksheet.
6. While going to the spawning grounds, draw only ADULT cards.
7. Salmon may lay as many as 5, 000 eggs, but not all of them hatch. Use the instructions of the worksheet to determine the number of alevin or sac-fry that will grow into fingerlings/fry and head back to the ocean.
8. When returning to the ocean, draw only YOUNG SALMON cards.
9. The player who gets the **most** fish back to the ocean wins.

Ocean Adult $\frac{1}{2}$ of your school is caught by commercial anglers	**Ocean Adult** $\frac{1}{2}$ of your school is eaten by a school of hungry whales which heard the fish while eating them
Ocean Adult $\frac{1}{4}$ of your school is caught by a party boat of sports anglers	**Ocean Adult** $\frac{1}{2}$ of your school is lost. It is an El Nino year. There is a lack of plankton and consequently less krill for the salmon to eat.
Ocean Adult $\frac{1}{4}$ of your school is caught by commercial anglers for the retail market	**Ocean Adult** $\frac{1}{4}$ of your school is eaten by predators including sharks and seals
Ocean Adult None of your school dies; it has found enough food, has not been caught by predators, and has encountered normal weather	**Ocean Adult** $\frac{1}{2}$ of your school dies as a result of large ocean storms which upset the food balance
Ocean Adult None of your school dies as the weather has been perfect. **MOVE AHEAD 1 SPACE**	**Ocean Adult** $\frac{1}{4}$ of your school has eaten small fish which has consumed plastic pollution. They do not supply enough nutrients for you to live

Young Salmon Stream $\frac{1}{2}$ of your school is eaten by predatory fish in the stream	**Young Salmon Stream** $\frac{1}{2}$ of your school dies when they enter a water diversion pipe without a screen cover
Young Salmon Stream $\frac{1}{4}$ of your school is killed by pesticide runoff from a nearby farm	**Young Salmon Stream** $\frac{1}{2}$ of your school dies because insects and larvae are not available to feed the young salmon
Young Salmon Stream $\frac{1}{2}$ of your school is killed before it even hatches when mud from a new housing development smothers the eggs	**Young Salmon Stream** $\frac{1}{4}$ of your school dies after swimming into an area of very hot water where the stream is being used to cool water
Young Salmon Stream $\frac{1}{2}$ of your school dies after passing through toxic chemicals leaking into the stream from an illegal waste dump	**Young Salmon Stream** None of your salmon die as the spawning grounds are protected by laws which preserve their natural state. **MOVE AHEAD 1 SPACE**
Young Salmon Stream $\frac{1}{4}$ of your school dies after entering a section of the stream where industrial pollutants have been dumped	**Young Salmon Stream** $\frac{1}{4}$ of your school is left stranded in shallow pools by a passing flood. They cannot get back to the creek, so they die

Stream Adult $\frac{1}{4}$ of your school are caught by commercial anglers. They are sold fresh to a seafood market	**Stream Adult** $\frac{1}{2}$ of your school dies after entering a stream that has high pesticides because of runoff from a farm
Stream Adult $\frac{1}{2}$ of your school dies because improper farming methods have choked the stream with mud	**Stream Adult** $\frac{1}{2}$ of your school dies in very low water because it has not rained or snowed this winter or early spring
Stream Adult $\frac{1}{4}$ of your school are caught by eagles and bears	**Stream Adult** $\frac{1}{2}$ of your school dies because the forest along the stream was cut and stumps and logs have formed dams which many Atlantic salmon cannot cross
Stream Adult $\frac{1}{2}$ of your school dies because of a flood control project. Your home stream has been cut into channels. Many of the places to spawn have been destroyed	**Stream Adult** $\frac{1}{4}$ of your school are eaten by predators such as a family of hungry bears
Stream Adult None of your school dies because the stream you enter is protected as part of a park. Dams have been removed, sediment is kept from running into the water, and fishing is limited. **MOVE AHEAD 1 SPACE**	**Stream Adult** $\frac{1}{4}$ of your school are caught by poachers with nets and traps in the shallow, narrow creek

Estuary Adult $\frac{1}{4}$ of your school are eaten by sea lions	**Estuary Adult** $\frac{1}{2}$ of your school are caught by commercial and sport anglers
Estuary Adult $\frac{1}{4}$ of your school dies because the water level of the estuary is too low due to drought this year	**Estuary Adult** None of your school dies because it has found the conditions for the trip through the estuary and up the river to be excellent. **MOVE AHEAD 1 SPACE**
Estuary Adult $\frac{1}{4}$ of your school dies because much of the wetlands has been drained and filled for development	**Estuary Adult** $\frac{1}{2}$ of your school dies because part of the school takes a fork in the river that leads to a dam with no way around
Estuary Adult $\frac{1}{2}$ of your school dies from small sedimentation that has altered the waterway and decreased the water level	**Estuary Adult** $\frac{1}{4}$ of your school dies due to a toxic spill in the estuary
Estuary Adult None of the school dies. The estuary has been restored	**Estuary Adult** $\frac{1}{4}$ of your school are caught by sport fishermen lining the banks of a narrow river channel

Young Salmon Estuary $\frac{1}{2}$ of your school dies after swimming through an area polluted with industrial wastes that would not have harmed the adults, but are toxic to young salmon	**Young Salmon Estuary** None of your school dies as it manages a safe passage toward the sea. **MOVE AHEAD 1 SPACE**
Young Salmon Estuary $\frac{1}{2}$ of your school dies when it swims into an area where an algal bloom has died, using all the oxygen in the water as the algae decompose	**Young Salmon Estuary** $\frac{1}{4}$ of your school dies after being attacked sea lampreys
Young Salmon Estuary $\frac{1}{4}$ of your school are eaten by a herd of sea lions, which target salmon	**Young Salmon Estuary** $\frac{1}{4}$ of your school dies from lack of food caused by salinity changed in the water due to unusually dry weather
Young Salmon Estuary None of your school dies as it has avoided predators, has not been exposed to toxic wastes because laws have helped control wastes, and has found normal food supplies and weather	**Young Salmon Estuary** $\frac{1}{2}$ of your school dies after swimming through water polluted with runoff from farms
Young Salmon Estuary $\frac{1}{4}$ of your school dies after swimming into the intake pipe of a hydroelectric plant	**Young Salmon Estuary** $\frac{1}{2}$ of your school are eaten by a large school of hungry bass. The rest escape as sport fishermen scare the bass away while moving their boats through the school trying to catch the bass

Young Salmon Ocean None of your school dies as they have found sufficient food and escaped the notice of predators	**Young Salmon Ocean** None of your school dies as you have escaped predators and found plenty of plankton to eat
Young Salmon Ocean A boat of poachers has captured $\frac{1}{2}$ of your school. They will be caught by a warden at the dock. Cut your number by half and **MOVE AHEAD 1 SPACE**	**Young Salmon Ocean** $\frac{1}{2}$ of your school dies due to lack of sufficient plankton, the food on which you depend
Young Salmon Ocean $\frac{1}{2}$ of your school is eaten by a hunger school of bass	**Young Salmon Ocean** $\frac{1}{4}$ of your school dies due to lack of food during an El Nino year when the ocean temperatures are higher
Young Salmon Ocean $\frac{1}{2}$ of your school is caught by commercial fishermen in international waters	**Young Salmon Ocean** $\frac{1}{4}$ of your school are caught by a party boat of sports anglers
Young Salmon Ocean $\frac{1}{4}$ of your school are eaten by a pod of killer whales	**Young Salmon Ocean** $\frac{1}{4}$ of your school are eaten by a pod of sperm whales

Grade 5 Classroom Hatchery Activities

Lesson 11: Meet an Atlantic Salmon

Lesson Objectives:

- Familiarize students with the identification of Atlantic Salmon;
- Familiarize students with basic fish biology, identification, and terminology;
- Assist students with recognizing the value of proper species identification;
- Compare and contrast organ systems of humans and Atlantic Salmon

Materials:

- Projector connected to computer or printed presentation (found below);
- 3 page handout (found below - print enough for student groups of 2 - 4);
- Pencils

Background

Ontario is home to nearly 150 fish species; 129 being native. Proper identification of species is useful for species monitoring (species presence and location, population size, fish health…), and for complying with fishing regulations. Identification can also help build a deeper connection with a species as we learn about different patterns in their life stories. It can also be a lot of fun!

Fish just like all other living things have unique physical characteristics that distinguish one species from another. Size, colouration, shape, and presence or absence of particular features are some of these characteristics. Atlantic Salmon like other salmon have an adipose fin (the small fin on the back of fish just in front of the tail) and a soft dorsal fin. The Atlantic Salmon has dark spots on a lighter coloured body, only 2-3 large spots on the gill cover, a mouth that stops at the back of the eye and a long narrow caudal peduncle (the part of the fish just before the tail). These characteristics are shown in the presentation below.

It is important that scientists and anglers can properly identify Atlantic Salmon to give them the best level of care and so that anglers can follow fishing regulations. Anglers with proper identification skills can be valuable citizen scientists who can greatly contribute to monitoring efforts.

Internally the Atlantic Salmon share some similarities with our own bodies. Like us they are vertebrates and have a similar (but slightly different) digestive and circulatory systems (fish have a 2 chambered heart versus our 4). They also have some major differences. The basic difference is that fish are cold blooded versus humans being warm blooded. Most fish have gills for breathing in the water and no lungs for breathing in air (there are a few exceptions!). The fish also have a swim bladder to control bouncy; a similar function as a SCUBA diver's buoyancy control device.

Teaching and Learning Sequence

Part A. Share this **Cool Atlantic Salmon Fact:** *Atlantic Salmon are known as the "Leaper". They can jump out of the water 3 metres high! That is as high as a basketball net!!*

Part B. Ask these **Guiding Questions**

1. Has anyone ever seen and Atlantic Salmon?
2. How might you tell the difference between an Atlantic Salmon and another fish?

Part C. Present **"Basic Fish ID"** (on a projector screen or print/display to class).

33. Print off the 3 pages of "***Meet an Atlantic Salmon"*** below where it says "copy me" (enough copies to have groups of 2-4 students);
34. Page 1 of Presentation: Allow time for the students to talk about what they see. You are not looking for specific answers; rather engaging their observation skills;
35. Page 2- 4: Show the 1 or 2 characteristics identified on each fish. This can be done quickly and is intended to show the students some of the main physical differences between fish. Atlantic Salmon being our focus fish has more characteristics identified;
36. Page 5 shows the fins of the Atlantic Salmon. The presence of these fins are characteristic of all the salmon species. Point out and define the ***adipose fin =*** *A small fleshy fin just ahead of the tail. Found on only a small number of fish species including salmon*;
37. Have the students get in groups of 2 – 4;
38. Give each group a copy of the handouts and have them try to work through them;
39. Take the activity up as a class and have the students share their thinking and correct any errors.

ANSWERS

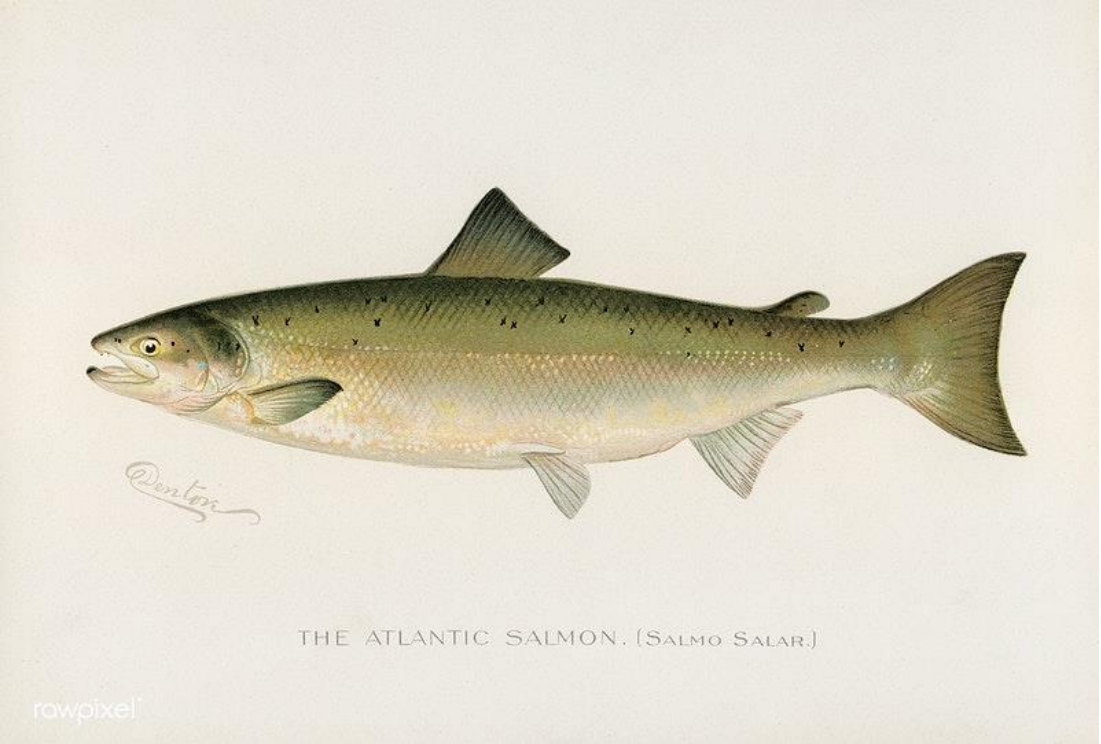
A. Use the presentation slide. **B.** Can include: heart; liver; kidney; brain; intestines; eyes; gall bladder; stomach; **C.** (C, I, K, D, F, A, L, J, E, B, H, G,) **D.** 1. Kidney; 2. Swim bladder; 3. Brain; 4. Eye; 5. Olfactory system; 6. Gills; 7. Heart; 8. Liver; 9. Stomach; 10. Spleen; 11. Intestines; 12. Muscle. **E. Can include:** Humans: lungs; arms; legs; fingers; toes; ears. Atlantic Salmon: fins; swim bladder; gills; lateral line; otolith. Both: heart; kidney; liver; stomach; intestines; brain; eyes; gall bladder; vertebrate.

Part D. Ask these **Reflection Questions** (can be done as a Think, Pair, Share)

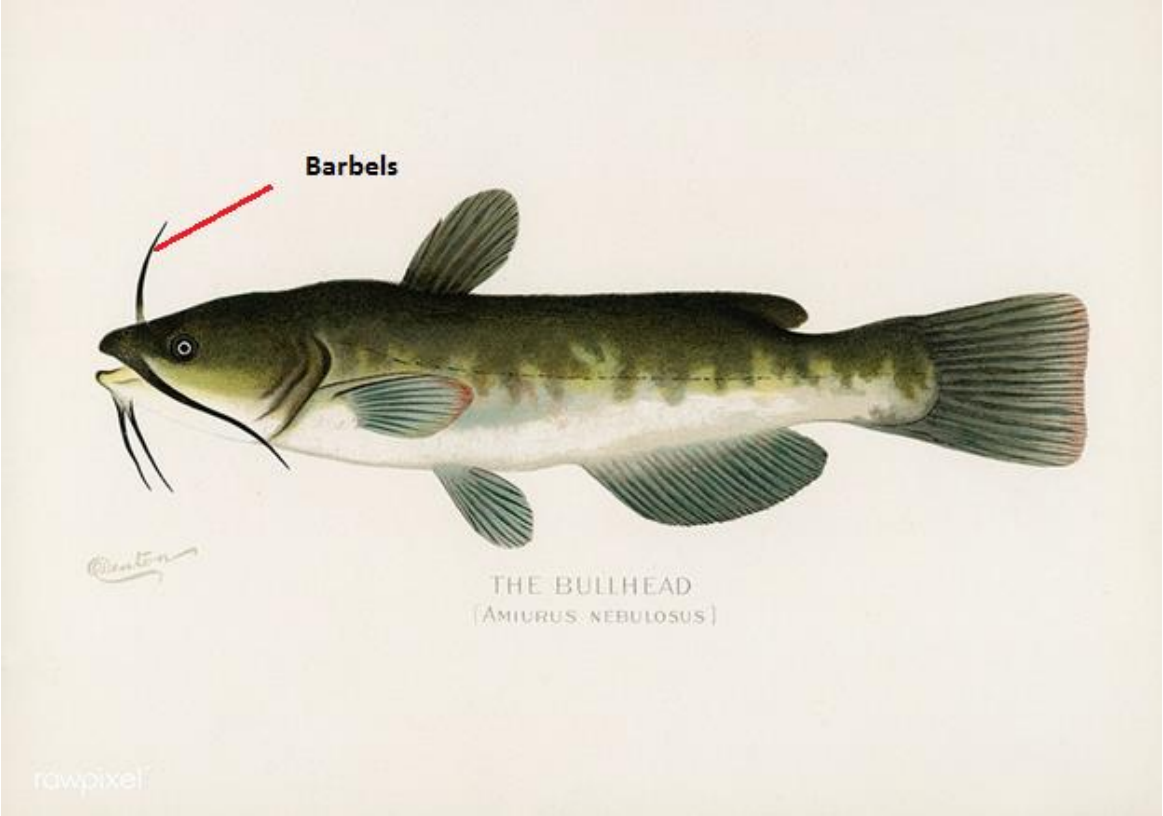
1. Why is the proper identification of fish important?
2. Name some identifying characteristics of an adult Atlantic Salmon.
3. How are Atlantic Salmon and humans different? How are they the same?

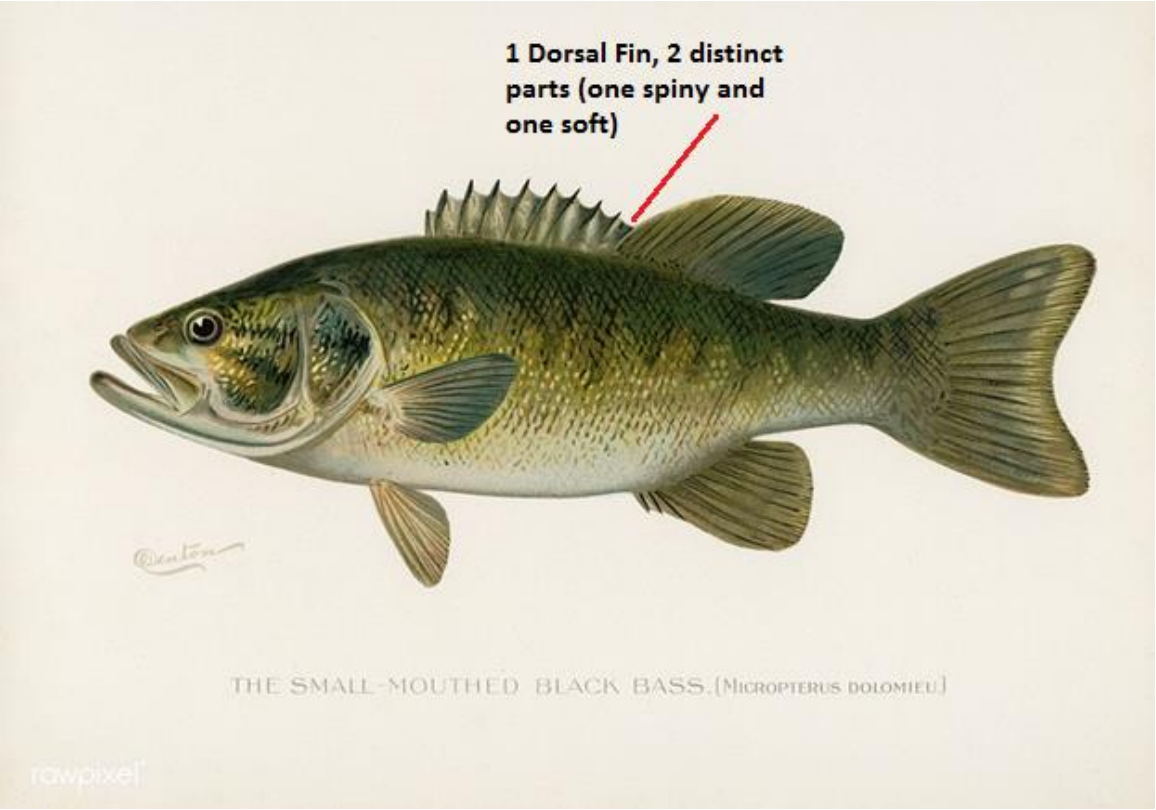
Presentation: Basic Fish Identification

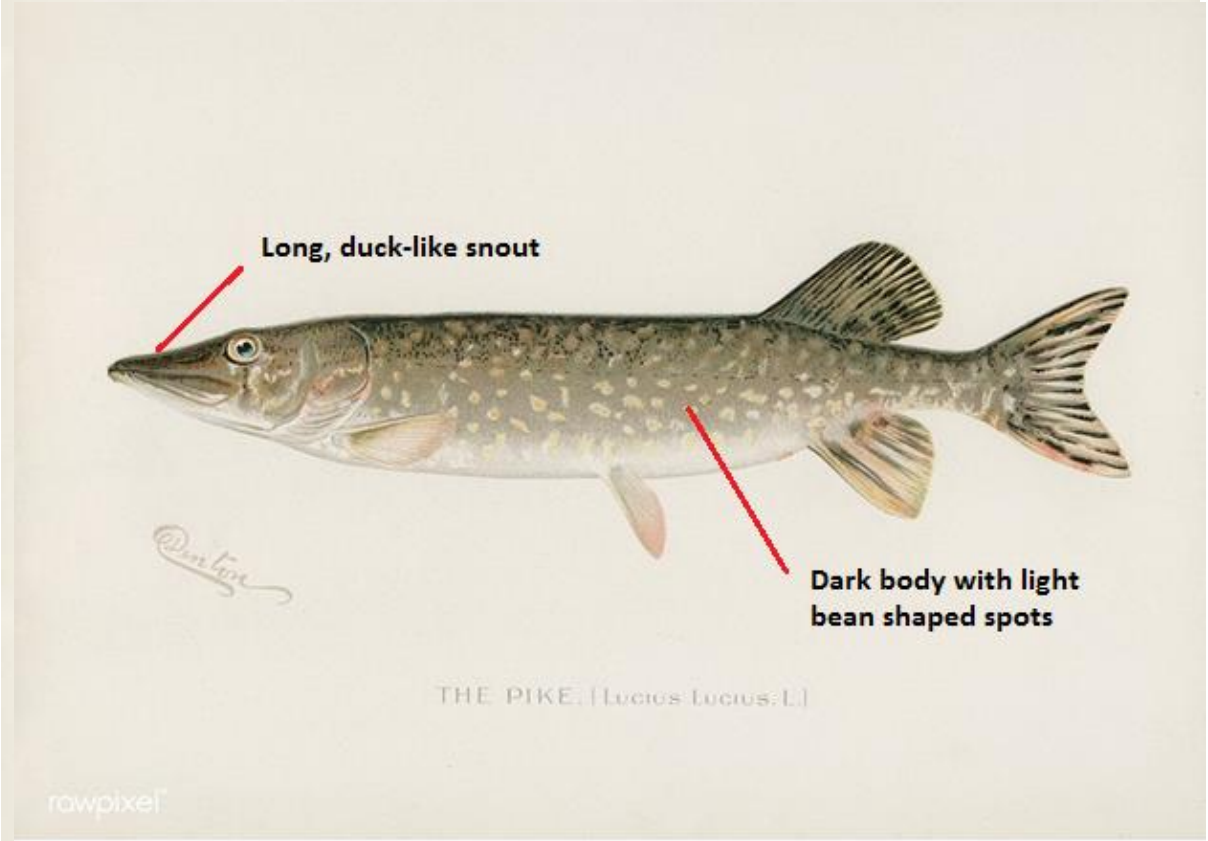
What Differences Do You See?

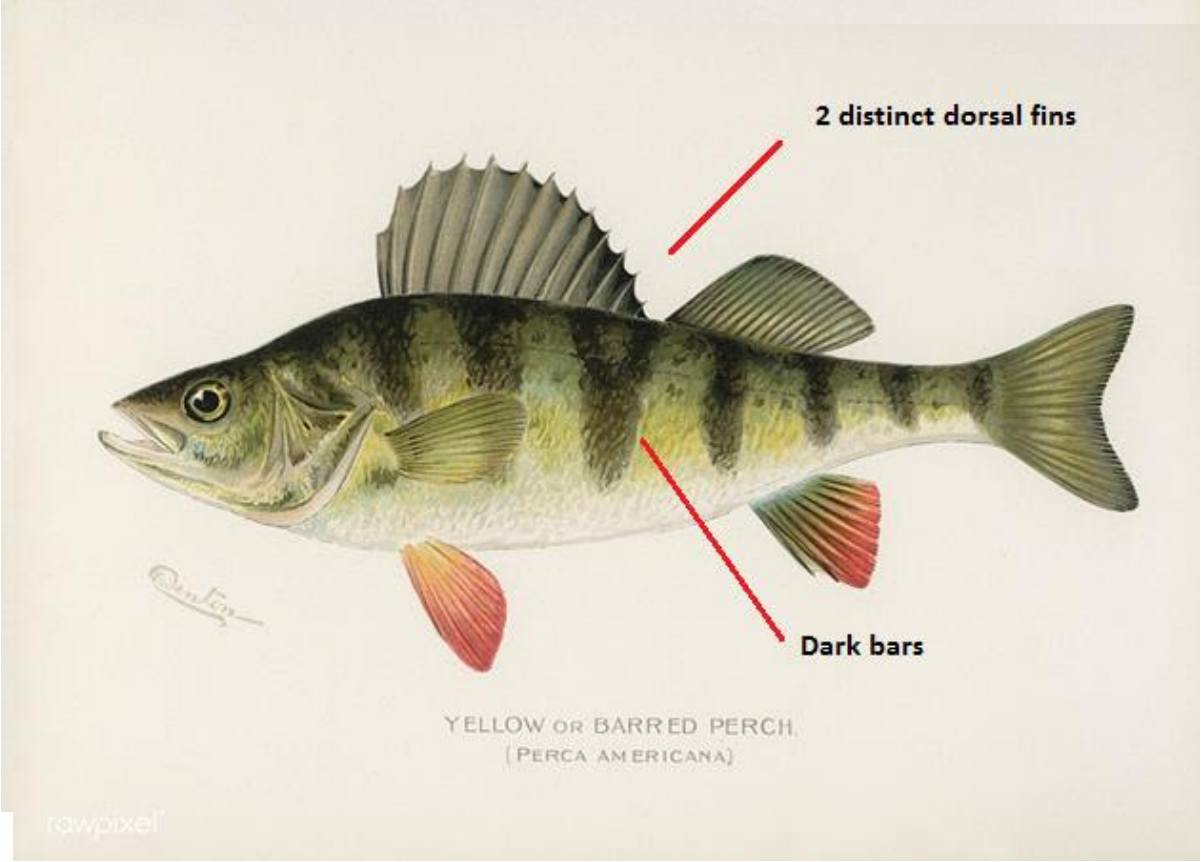


Some Basic Physical Characteristic Differences

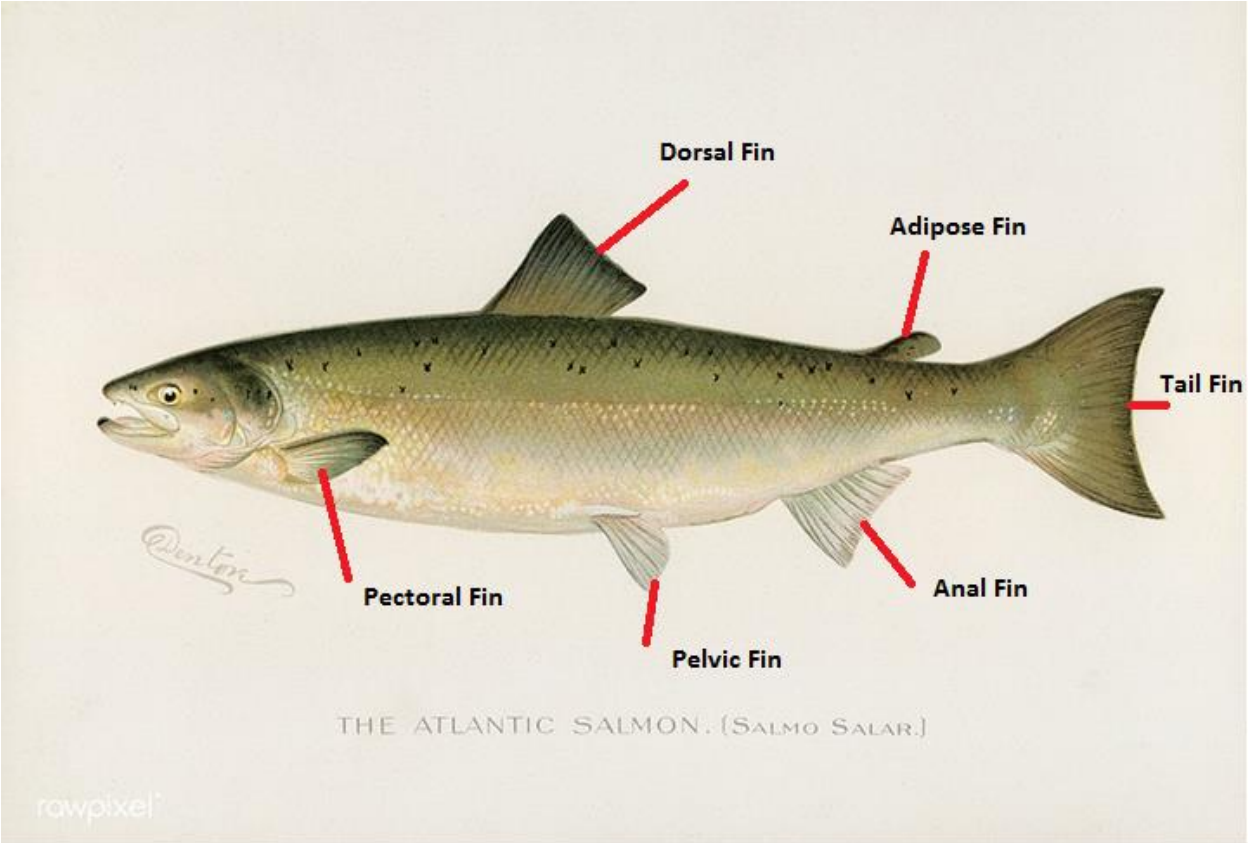





Long, duck-like snout
Dark body with light bean shaped spots
THE PIKE. [Lucios Lucius: L.]
rawpixel


2 distinct dorsal fins
Dark bars
YELLOW OR BARRED PERCH.
[PERCA AMERICANA]
rawpixel

Fins of a Salmon



Fish

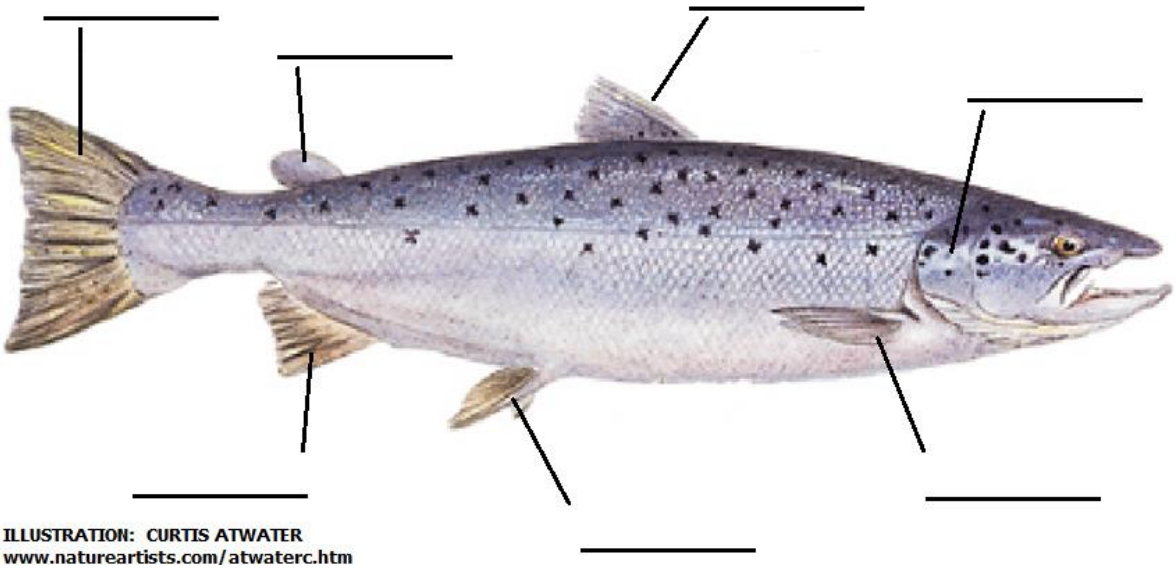
Illustrations from Game Birds and Fishes of North America; illustrated by Sherman F. Denton (1856–1937)

Student Name(s):

COPY ME

Meet an Atlantic Salmon

A.



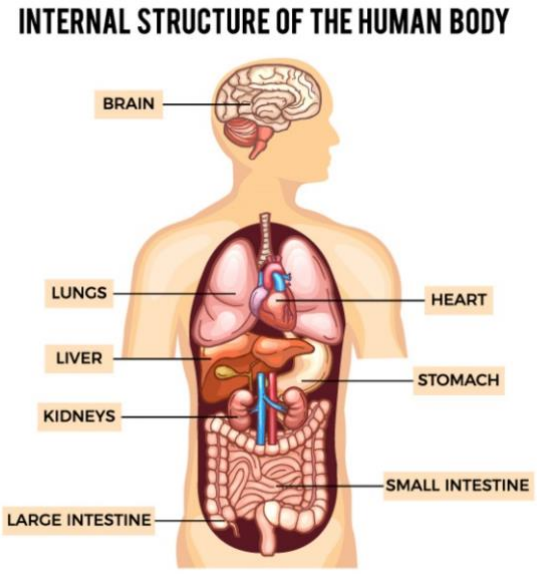
Label the fish above appropriately with the words below:

Anal Fin	Dorsal Fin
Tail Fin	Pelvic Fin
Adipose Fin	Gill Cover
Pectoral Fin	

B.

How is an Atlantic Salmon's organ system like a humans? List 3 organs that humans have that you think a fish also has.

1) _____
2) _____
3) _____



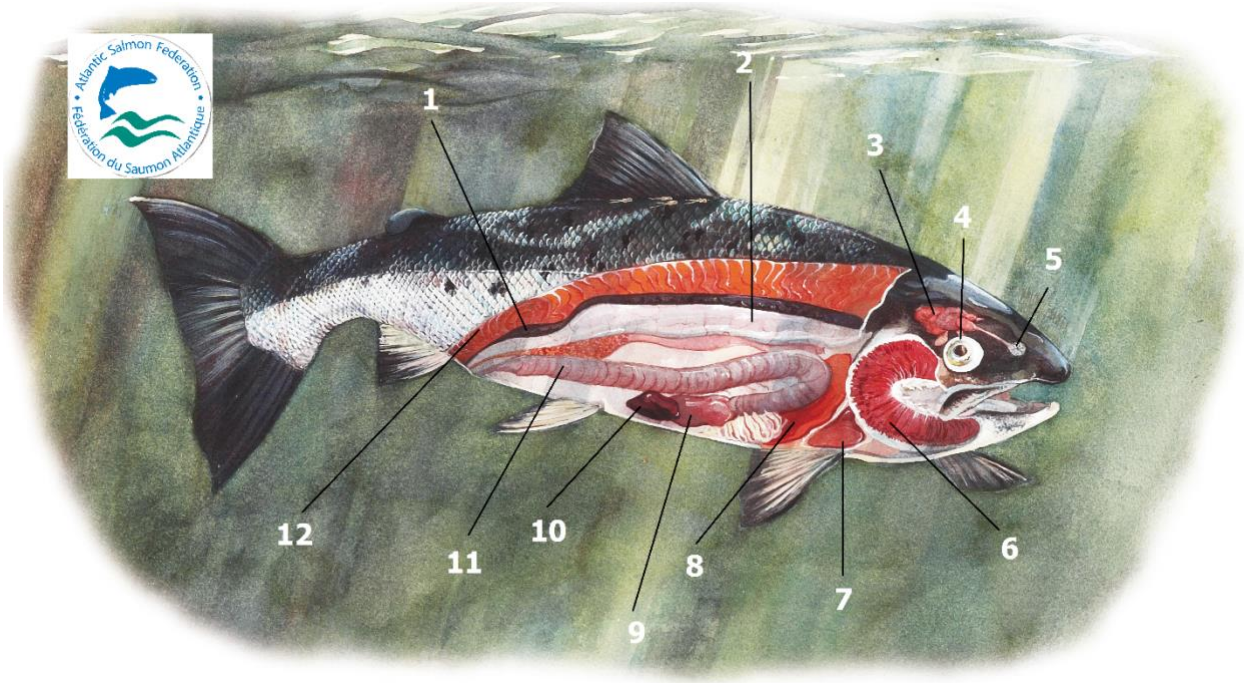
COPY ME

C.			Word Match
A. Heart			*A gas filled sac used to control buoyancy*
B. Gills			*Responsible for part of the digestion*
C. Swim Bladder		K	*Organ responsible for sight*
D. Spleen			*Part of immune system involved in production and removal of blood cells*
E. Olfactory System			*Tissue that enables motion and force*
F. Muscle			*Pump for circulation of blood through the body*
G. Liver			*Centre of the nervous system that controls the body*
H. Kidney			*Tube running from the stomach to the anus where nutrients are absorbed*
I. Stomach			*Organ responsible for the sense of smell*
J. Intestines			*Extracts oxygen from water for respiration*
K. Eye			*Removes waste and regulates water and salt*
L. Brain			*Detoxifies the body and aids in digestion*

Write the letter from each word in front of the correct description.

D. Fish Organs

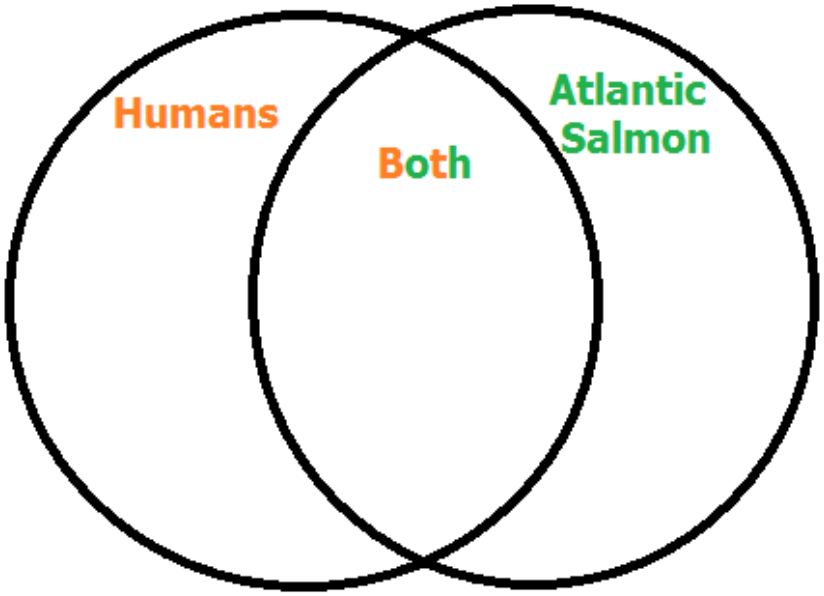
COPY ME



Using the definitions and diagram above try your best to match the numbers in the diagram to the correct organs in this list: Heart; Gills; Swim Bladder; Spleen; Olfactory System; Eye; Muscle; Liver; Kidney; Stomach; Intestines; Brain		
1. _____	5. _____	9. _____
2. _____	6. _____	10. _____
3. _____	7. _____	11. _____
4. _____	8. _____	12. _____

E.

Compare and contrast anatomy including organs of humans and Atlantic Salmon by listing in the circles to the right. Use the diagrams of the Atlantic Salmon and the human in this activity. What other anatomy can you think of?



Grade 5 Classroom Hatchery Activities

Lesson 12: A day in the Life of a Salmon

Lesson Objectives:

- Connect students with the life story of Lake Ontario Atlantic Salmon
- Have the students write a short story from the perspective of an Atlantic Salmon, choosing a life stage from the salmon's life cycle;
- Engage imagination and creativity;
- Have the students share stories.

Materials:

- Lined paper;
- Pens/pencils

Background:

Adult Atlantic Salmon live out in the deep waters of the Atlantic Ocean or in large lakes where they grow big on a diet of fish. Eventually the urge to spawn comes over them and they swim upstream jumping rapids up to 3 metres high! At this time they stop eating and change colour from light and silvery to a deep bronze. Reddish spots appear on the head and body. The head of the male elongates and the lower jaw becomes enlarged and hooked. This hook is called a kype.

The females search for ideal locations for a "redd"; the males search for females. The ideal redd location consists of a gravel bottom where the female can use her tail to dig a 10-30cm deep nest. The female lays between 2,000 and 8,000 ***eggs***. The male fertilizes the eggs and the female covers the redd with gravel. The eggs start to develop and soon they become ***eyed eggs*** (you can see the eyes in the egg). A few months after being deposited in the redd the eggs begin to hatch. When the baby salmon hatch from the egg they bring with them a yolk sac attached to their bellies. For the next few months this will be their food. These baby fish, known as ***alevin,*** are fragile and vulnerable. They hide in the gravel of the redd. The yolk sac is slowly absorbed. Its rate of usage corresponds to water temperature. In warmer temperatures the yolk is absorbed faster. Once the yolk sac is gone these little fish, now known as ***fry,*** need to hunt for their own food. As temperatures warm, small aquatic invertebrates also become abundant which is good for the fry as this is their food. The fry hide in the rocks to avoid predators (like bigger fish, birds, and small mammals) and to catch the aquatic invertebrates.
The fry grow larger throughout the summer and develop dark "parr" marks. At this stage they are called ***parr***. The parr stay in the stream for 1 – 3 years using with the same strategy as the fry – eat and don't get eaten!

When the parr get large enough they will become ***smolts.*** At this stage they lose the parr marks and turn the more silvery colour of the adult fish. The smolts migrate downstream to the lake to eat fish, grow big, and become adults. When they are ready to spawn they will return to the same place that they were born.

Teaching and Learning Sequence

Part A. Ask the students:

1. What would it be like to be an Atlantic Salmon?
2. What hazards and hardships do Atlantic Salmon face?

Part B. Engage their senses

- Encourage the students to imagine themselves as an Atlantic Salmon. Have them close their eyes and imagine the cool water and the pull of the current on their skin; take a deep breath and smell the make-up of the water; see under a log and beside a large rock; watch other fish swim by;
- Describe the life cycle story in the background above;
- Have the students select a life stage and write a short (4 – 6 paragraphs) story about a day in a life of the fish. Elements of the story could include hunting for food, avoiding a predator, getting past an obstacle to migration, or interacting with another fish. They can also choose names for their fish.

Part C. Share

- Ask a few of the students to share their story with the class.

Grade 6 Classroom Hatchery Activities

Lesson 13: Biodiversity Stations

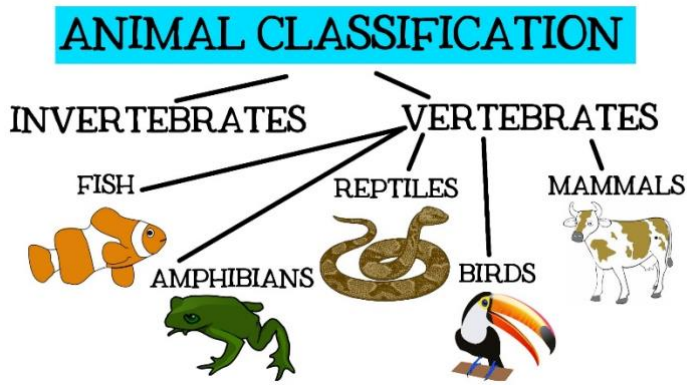
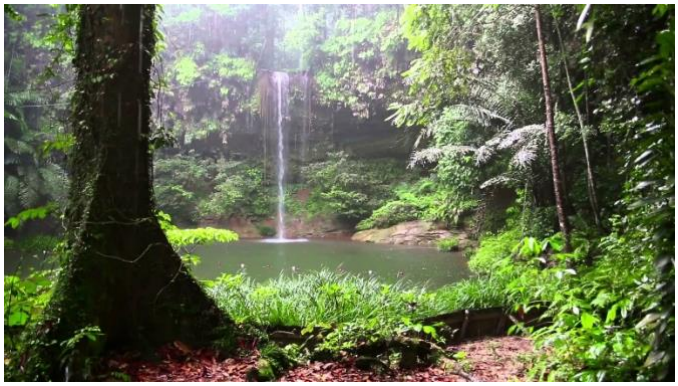
Objectives:
These biodiversity stations will hook students into learning the concept of biodiversity, what it means and how it plays a role within our ecosystem and the animals that surround them.

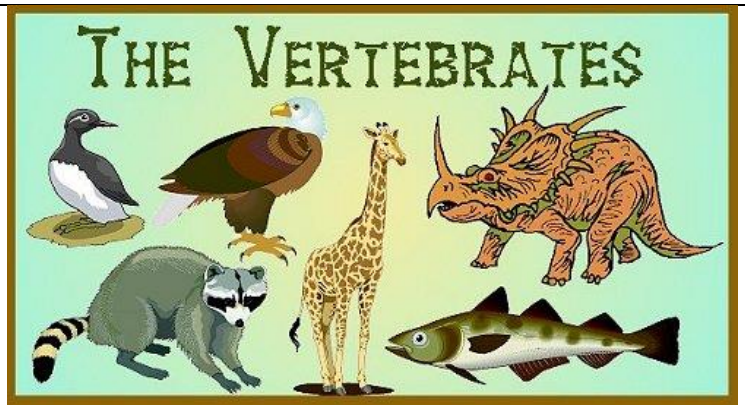
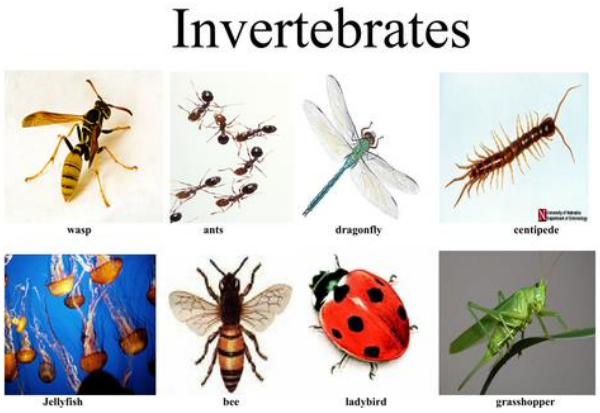
Materials:
- Organize It! Vocabulary Cards: Picture/short sentences and word and definition cards (attached)
- 2 envelopes to keep the vocabulary cards organized separately: one envelope for sorting the picture with the short sentence and the other enveloped for sorting the word and definition
- Explore It! Biodiversity Go Fish! Cards and instructions (attached)
-1 envelope or Ziploc bag to hold the Biodiversity Go Fish Cards
-Research It! Adaptation and Biodiversity: Fish (attached)
-Personal technology that can be used for the Research It! station
-Write It! Identify Invertebrate and Vertebrates sorting and classify activity (attached)
-Read It! Animal adaptations reading comprehension (attached)
- 5 bins with the labels of each station to keep each activity in the bin and to be placed on the tables around the classroom.
-Classroom or digital timer: to be set at 7-8 minute intervals to indicate rotation between stations.

Teacher prep: cut out the instructions and each card. Be sure to cut the illustration card and definition card so they are separate and place them into 1 envelope.

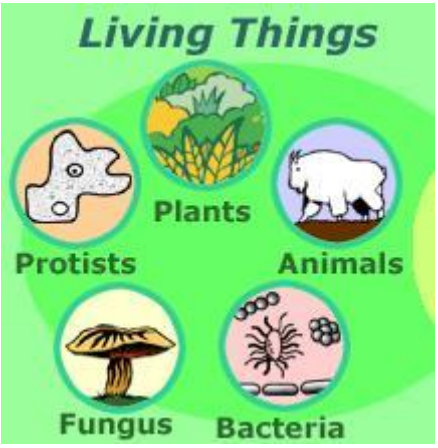
Vocabulary Cards- Instructions

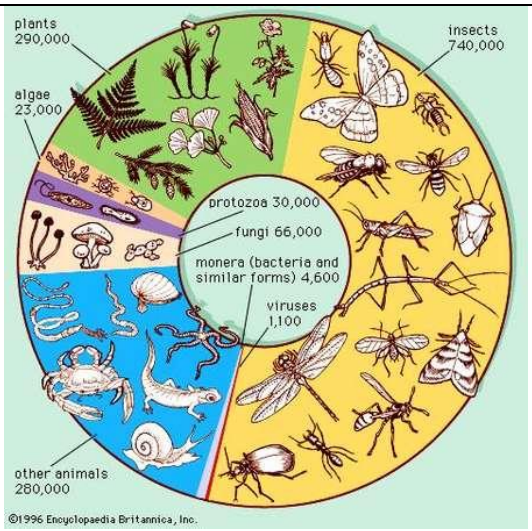
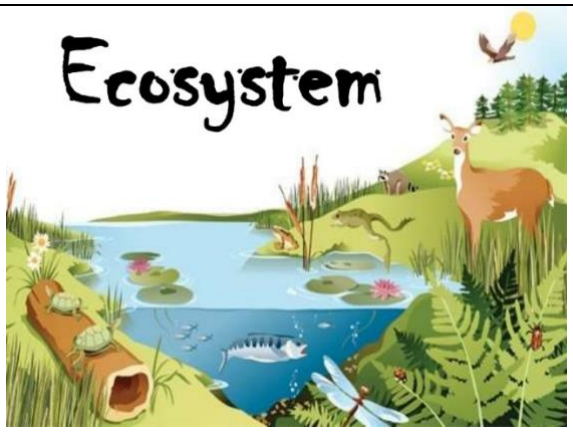
1. With your group, you have to match the picture with the correct short sentence cards.
2. Once you have matched the picture with the short sentence cards, you have to match the word card with the correct definition.

	The act of grouping living things by using a set of rules and similarities
	The variety of plant and animal that exist
	A group of plants and animals and their physical environment. An example of a natural community is a rainforest, the wildlife, the plants and environmental factors such as soil and moisture

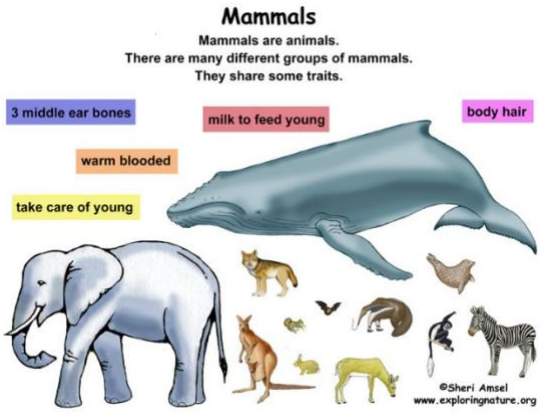
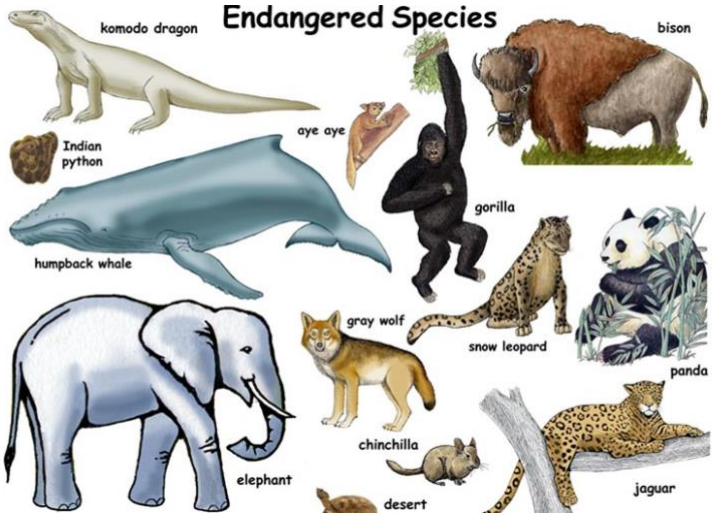
	The way in which each of two or more things is related to others. For example, a Bluegill and a Salmon are two different types of fish but are both from the fish family
	An animal that has a backbone (e.g. mammals, birds, reptiles, amphibians and fish)
	An animal that does not have a backbone (e.g., annelids, insects, crustaceans, arachnids)

	The ability of being stable: such as having the strength to survive or endure
	A special quality or appearance that makes an individual or a group different from others.
	An individual animal or plant.

	The natural home or environment of an animal plant or other organism.
	Means living organism within a specific environment
	Means non-living and include factors in an environment such as sunlight, temperature, winter patterns, rain, snow and sleet

	A group of living organisms
	A group of people or living things living in the same place or having a particular characteristic in common
	All the plants and animals that live in a particular area together that includes both living and nonliving parts such as air, water and soil.

	The study of living things, their environment and their relation between each other
	A particular section, group, or type of animals living in an area or country
	A group of warm blooded animals who have flexible hands and feet, each with five digits (e.g., humans, great apes, monkeys and lemurs)

	A vertebrate, warm-blooded animal that feeds it young with milk produced by the mother and has skin usually covered with hair (e.g., cow, dog, mouse, bear, or human being)
	An invertebrate animal which has specialized stingers in the tentacles surrounding the mouth (e.g. jelly fish, sea anemone, or coral)
	An animal or plant that exists in such small numbers that it is in danger of becoming extinct.

	A type of invertebrate having a segmented body divided into two parts, has four parts of legs but has no antennae (e.g., spiders, scorpions, mites, and ticks)
	An invertebrate animal with tube feet and 5 part symmetrical bodies (e.g., starfish, sea urchin)
	A cold-blooded vertebrate animal that has gills and lives in water in the larvae state but breathes air as adults (e.g., frogs and toads)

Teacher prep: cut out each card. Be sure to cut the word card and definition card so they are separate and place them into 1 envelope.

Vocabulary Cards- Instructions

1. With your group, once you have matched the picture with the short sentence cards, you have to match the word card with the correct definition.

Classification	The act of grouping living things by using a set of rules and similarities
Biodiversity	The variety of plant and animal that exist
Natural community	A group of plants and animals and their physical environment. An example of a natural community is a rainforest, the wildlife, the plants and environmental factors such as soil and moisture
Interrelationships	The way in which each of two or more things is related to others. For example, a Bluegill and a Salmon are two different types of fish but are both from the fish family
Vertebrate	An animal that has a backbone (e.g. mammals, birds, reptiles, amphibians and fish)
Invertebrate	An animal that does not have a backbone (e.g., annelids, insects, crustaceans, arachnids)
Stability	The ability of being stable: such as having the strength to survive or endure

Characteristic	A special quality or appearance that makes an individual or a group different from others.
Organism	An individual animal or plant.
Habitat	The natural home or environment of an animal plant or other organism.
Biotic	Means living organism within a specific environment
Abiotic	Means non-living and include factors in an environment such as sunlight, temperature, winter patterns, rain, snow and sleet
Species	A group of living organisms
Community	A group of people or living things living in the same place or having a particular characteristic in common
Ecosystem	All the plants and animals that live in a particular area together that includes both living and nonliving parts such as air, water and soil.
Ecology	The study of living things, their environment and their relation between each other
Population	A particular section, group, or type of animals living in an area or country
Primate	A group of warm blooded animals who have flexible hands and feet, each with five digits (e.g., humans, great apes, monkeys and lemurs)

Mammal	A vertebrate, warm-blooded animal that feeds it young with milk produced by the mother and has skin usually covered with hair (e.g., cow, dog, mouse, bear, or human being)
Cnidarian	An invertebrate animal which has specialized stingers in the tentacles surrounding the mouth (e.g. jelly fish, sea anemone, or coral)
Endangered Species	An animal or plant that exists in such small numbers that it is in danger of becoming extinct.
Arachnid	A type of invertebrate having a segmented body divided into two parts, has four parts of legs but has no antennae (e.g., spiders, scorpions, mites, and ticks)
Echinoderm	An invertebrate animal with tube feet and 5 part symmetrical bodies (e.g., starfish, sea urchin)
Amphibian	A cold-blooded vertebrate animal that has gills and lives in water in the larvae state but breathes air as adults (e.g., frogs and toads)

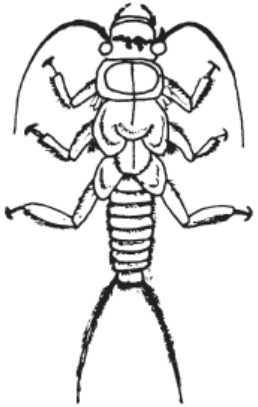
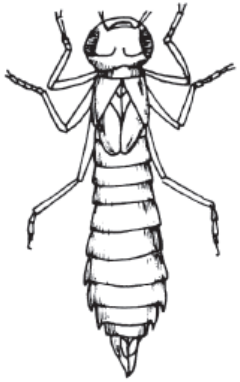
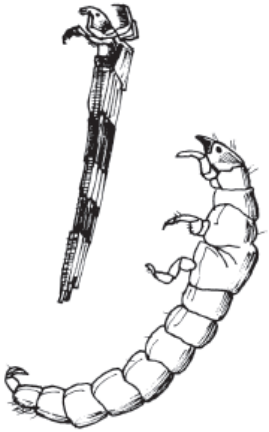
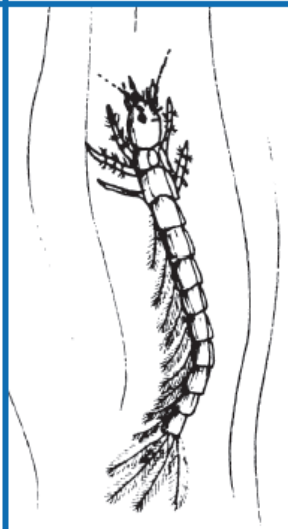
Play/Model: Biodiversity Go Fish!

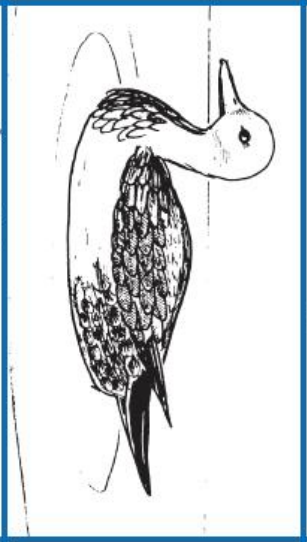
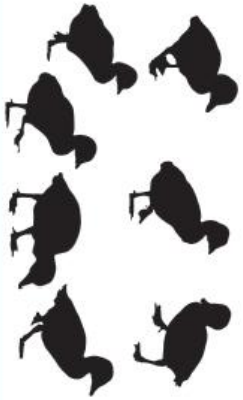
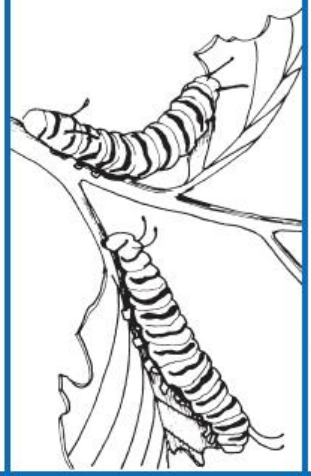
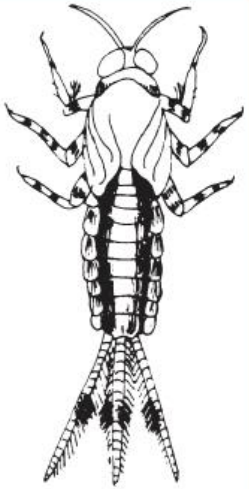
How to play: Each player gets 7 cards. The rest of the deck is placed in the middle of the players face down. Each player gets a turn in clockwise order (to the player's left). During a turn, a player asks another player if they have the juvenile (baby) or adult card of the species card to make a match. For example, a player would ask for the mosquito larva (juvenile/baby of a mosquito) to match to their adult mosquito species card. If the player doesn't have the matching species card, they say "go fish". When players "go fish" they can take a card from the deck in the middle of the group.

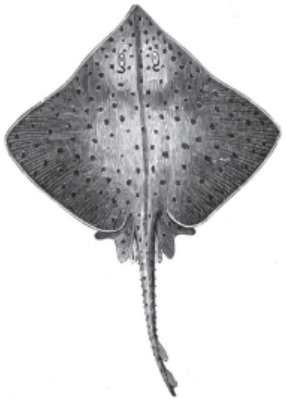
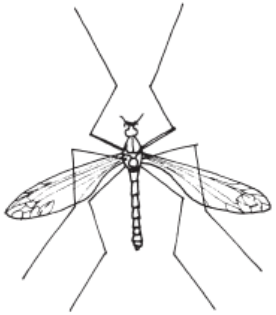
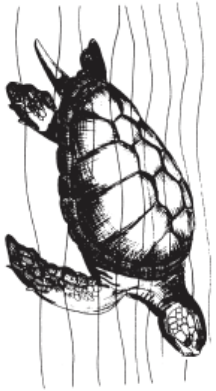
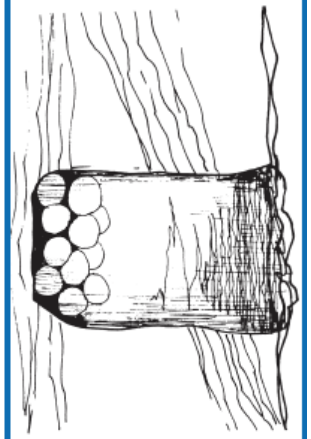
Play continues with players trying to find the match to their species card. Biodiversity Go Fish is over when one player runs out of cards and there are no more cards in the middle to pick up. The winner is the player with the most species cards matched in front of them.

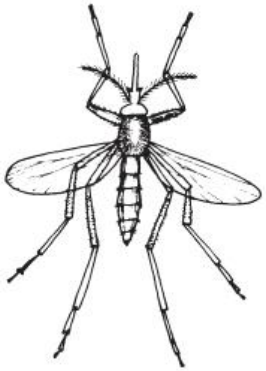
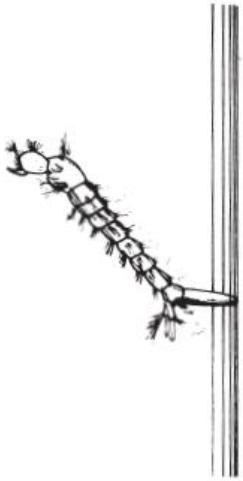
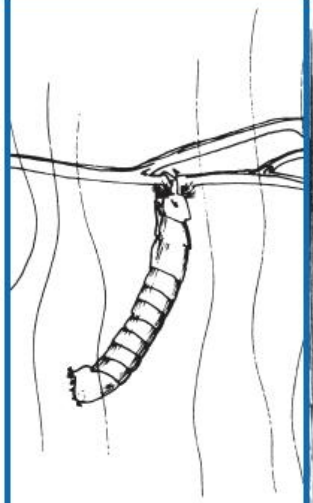
Biodiversity Go Fish! Cards:

Teacher prep: cut out each animal card so that each adult and juvenile species is separate from each other. Place all cards into 1 envelope.

Osprey	Stonefly	Dragonfly	Caddisfly	Whirligig Beetle
				
				
Osprey Chicks	Stonefly Nymph	Dragonfly Nymph	Caddisfly Larva	Whirligig Larva

Frog	Duck	Butterfly	Pelican	Mayfly
				
				
Tadpole	Ducklings	Butterfly Larva	Pelican Eggs	Mayfly Nymph

Skate	Manatee	Cranefly	Sea Otter	Sea Turtle
				
				
Skate Egg Case	Young Manatee	Cranefly Larva	Young Sea Otters	Sea Turtle Eggs

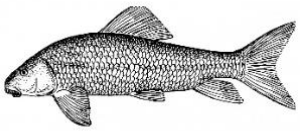
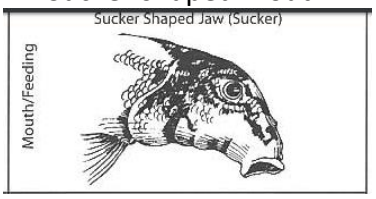
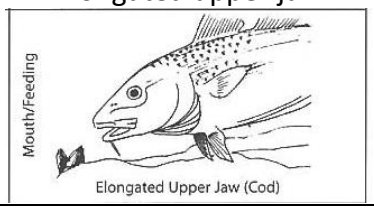
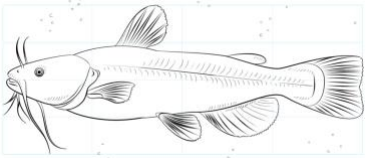
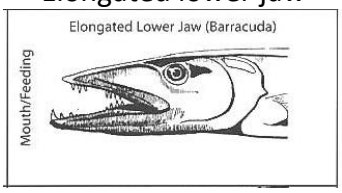
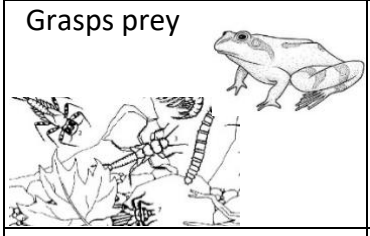
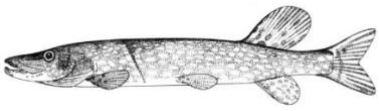
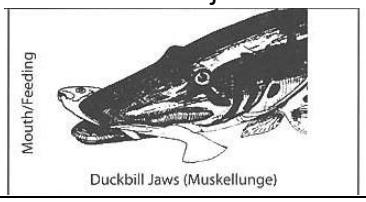
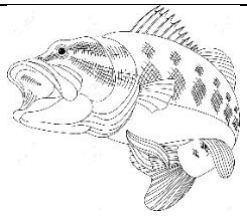
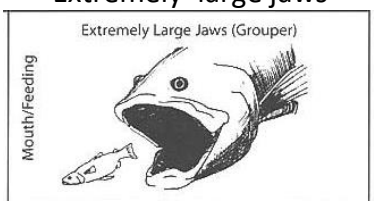
Beaver	Mosquito	Dolphin	Black Fly	Alligator
				
				
Young Beavers	Mosquito Larva	Young Dolphin	Black Fly Larva	Alligator Hatchling

Adaptations and Biodiversity

Fish

Cut out each of the fish food sources and jumble them up.

Next try to rematch the fish and its food source with the correct mouth, discussing with a partner why and how each mouth is suited for its purpose.

What they eat	Fish	Mouth
 Feeds on very small plants and animals	 Sucker, carp	Sucker shaped mouth 
 Feeds on prey it looks down on	 Spoonbill, sturgeon	Elongated upper jaw 
Feeds on prey it sees above 	 Barracuda, flathead catfish	Elongated lower jaw 
Grasps prey 	 Muskellunge, pike	Duckbill jaws 
 Surrounds prey	 Bass, grouper	Extremely large jaws 

Name: _____

Identify Invertebrates and Vertebrates

Many different animals share our planet with us. Many are alike, and many are different. Scientists **classify** animals based on their similarities. One way scientists group animals is whether or not these animals have a backbone.

Some animals like dogs, cats, birds, lizards, fish, and even humans have backbones. Scientists classify backboned animals as **vertebrates.**

Other animals, such as squid, worms, bugs, and clams do not have backbones. Scientists call these animals **invertebrates.**

Choose **five animals** from the list below. Write the animals name, whether it is a vertebrate or invertebrate, and two important traits in the chart below. An example has been provided for you.

Scorpion **Fox** **Octopus** **Snail** **Rabbit** **Wolf**

Deer **T-Rex** **Spider** **Fish** **Jellyfish** **Turtle**

Beetle **Hawk**

Animal	Vertebrate/ Invertebrate	Two important traits
Rabbit	Vertebrate	1. A rabbit has long ears 2. A rabbit is a mammal

Name: _____

Animal Adaptations

Learn about animal adaptations

Read the passage and answer the questions

An adaptation is a change that helps an animal survive in its environment. Animals depend on their physical features to get food, build homes, keep safe, withstand weather and attract mates. These features are called physical characteristics because they allow the animal to live in a certain place. These adaptations don't happen during one animal's life but over generations. Some examples of physical adaptations are the shape of a bird's beak, the number of fingers, colour of fur, and the shape of an ear or nose. These things can help an animal survive. For example, if there are a lot of squirrels in one wooded area and some of them are white and some are tan with brown spots, the white squirrels are very easy for the foxes to spot in the trees. The tan and brown spotted ones blend very easy making it hard for the foxes to spot them in the trees. The tan and brown spotted ones blend (camouflage) in the trees and are harder to see. The foxes would eat a lot more white squirrels. Slowly fewer and fewer white squirrels would be born. This is an example of how adaptations work.

1. Give an example of a physical adaptation. How might this help an animal survive?

_____

_____

_____

2. Can an animal adapt within its lifetime?

_____

_____

3. According to the example, which colour squirrel would you expect to see more of in ten years? Explain how you know.

_____

_____

_____

Grade 6 Classroom Hatchery Activities

Lesson 14: Hanging Atlantic Salmon Habitats

Objectives:
Students will be able to identify the components of a habitat that are essential for the Atlantic salmon to survive. After learning of the habitat requirements of a healthy habitat for an Atlantic salmon, students will create a habitat mobile that contains both specific habitat elements and key features to be included in Atlantic salmon habitat.

Materials:
-Scissors
-Pencil crayons
-Paper plate (1 plate per student)
-Piece of 24-inch string/yarn
-Piece of 12-inch string/yarn
-6 pieces of 6-inch string yarn
-Clear tape
-Glue
-Illustration of Atlantic Salmon (attached) or blank white paper if students choose to illustrate their own Atlantic salmon
-Old fishing or outdoors magazines that include images of habitat features (water, rocky bottom, streams, etc.) and for additional research if desired
-Technology if additional research is required
-Copies of existing art or photography showing the habitat for an Atlantic salmon (attached)
-Key features of Atlantic salmon Habitat (attached)

Background
Basic life-giving conditions of food, shelter, air, water and space in a suitable arrangement for animals to survive seem obvious, however, water is a sensitive part of the habitat and it must serve to do far more than quench thirst. Water in lakes and streams must meet specific requirements for different aquatic life forms, including the Atlantic salmon. Slight changes in salinity, pH (acidity), dissolved oxygen, and the presence of a wide range of pollutants in water can spell disaster for certain aquatic organisms.
To successfully support Atlantic salmon in Ontario waters, careful attention must be paid to the range of conditions that each life form can tolerate. There are also certain physical requirements in terms of the design and conditions that are most compatible for Atlantic salmon to have a healthy habitat. For example, some fish like the Atlantic salmon require moving water or currents. Other fish prefer almost static conditions. Some fish prefer deep water and others shallow rocky bottoms. The variations are remarkable when one considers the wide variety of habitats that can be found in Ontario waters and forests. The major purpose of this activity is for students to recognize and appreciate the complex life requirements of aquatic species like the Atlantic salmon. Learning about the wide variety of habitats but also making the connection that these species still require the same basic needs as humans, students are able to broaden their understanding of living things, relate it personally to themselves as well as create a foundation of knowing what needs have to be met, especially when raising their own Atlantic salmon in the classroom.

Procedure

1. Share with students a general discussion about mobiles- moving works of art that are created by suspending and balancing shapes. Explain that students will be creating “fish habitat” mobiles that incorporate important elements of the Atlantic salmon’s habitat. Review the components of a

habitat- food, water, shelter and space (physical components such as rocks, logs, etc.) Determine whether additional research is necessary. If so, allow students to conduct it (individually or in groups).

Point out that it might be difficult to visualize specific fish habitat and how all the parts fit together, since few of us spend much time looking around it. Provide copies of existing art or photography showing habitat for the Atlantic Salmon, or post it on-screen if computers or Smartboards are available. Look for common components that indicate major or important habitat features.

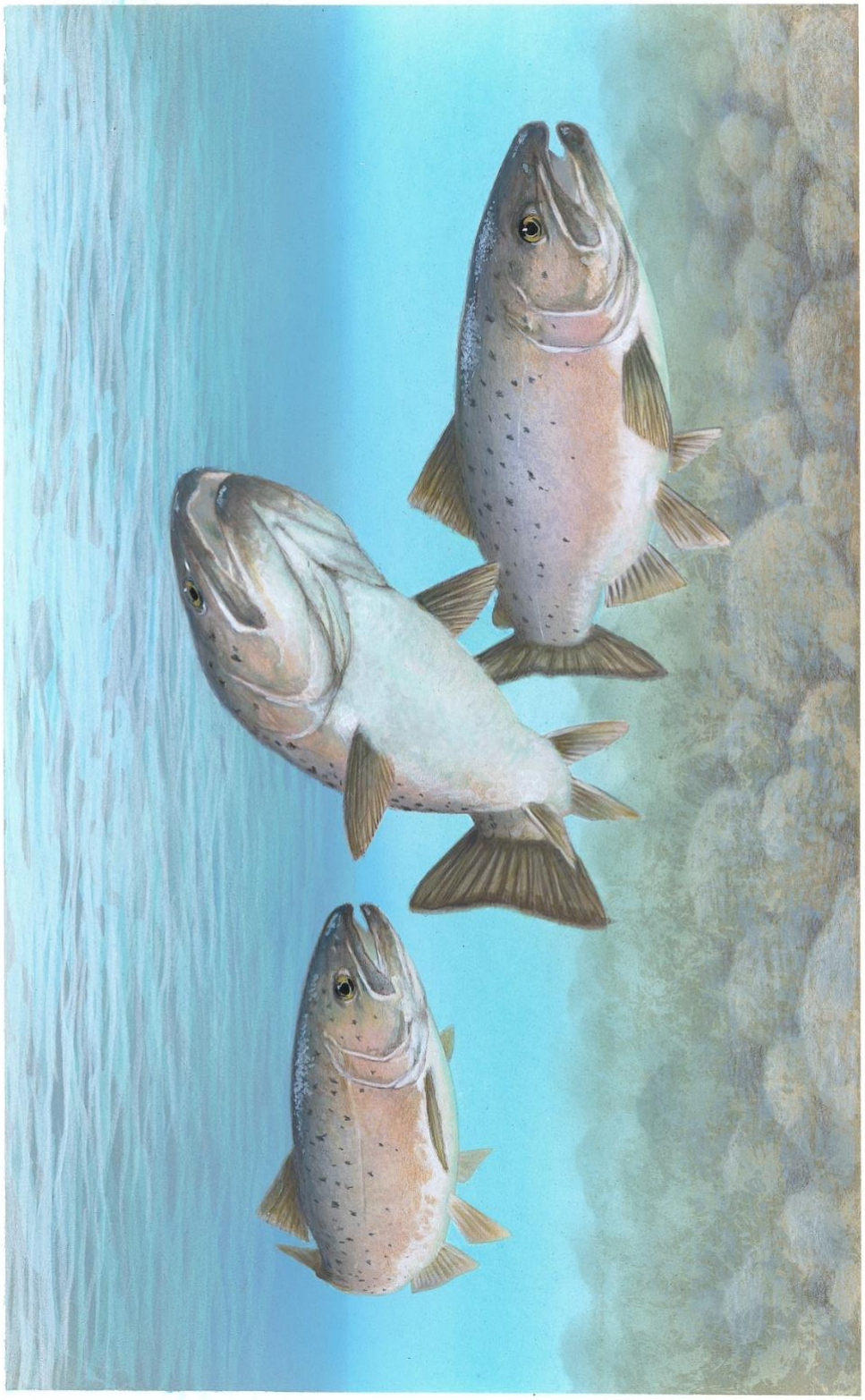
2. Tell students that they will now create a physical well-balanced mobile to depict the specific habitat for the Atlantic salmon. Hand out the following materials to each student: scissors, pencil crayons, glue, paper plate, one 24-inch string, one 12-inch string, six 6-inch strings, tape, and a copy of the Atlantic salmon illustration (or white paper if they want to illustrate their own salmon).
3. Instruct student to cut out the Atlantic salmon illustration or illustrate their own salmon on the white paper and then cut it out to be ready for the mobile. Students may colour their pages either before or after they cut. Included on each student page are two Atlantic salmon illustrations- these images can be shared between students **or** they can make their salmon on the mobile two-sided by cutting out both images and gluing them together prior to attaching them to the string affixed to the plate.
4. Place the paper plate on the table so that the bottom is facing upwards. Tape one end of the 24-inch string to the rim of the paper plate. Tape the other end of the string to the opposite rim of the paper plate. For extra stability, repeat with another string.
5. Glue an end of the 12-inch string on the back of the Atlantic salmon illustration. Next tape the free end of the 12-inch string to the middle of the paper plate on the top side (opposite of the 24-inch string).

Once the Atlantic salmon has been attached to the mobile, students are to continue cutting out the key features of a healthy Atlantic salmon habitat and also illustrate or cut out pictures from old fishing magazines of examples of features that make the habitat successful for salmon. Using the 6-inch string, each key feature is to be attached to a free end of the string, while the opposite end of the string are then taped equidistantly around the perimeter on the top of the plate. This will create a tiered effect between the Atlantic salmon and the habitat features.

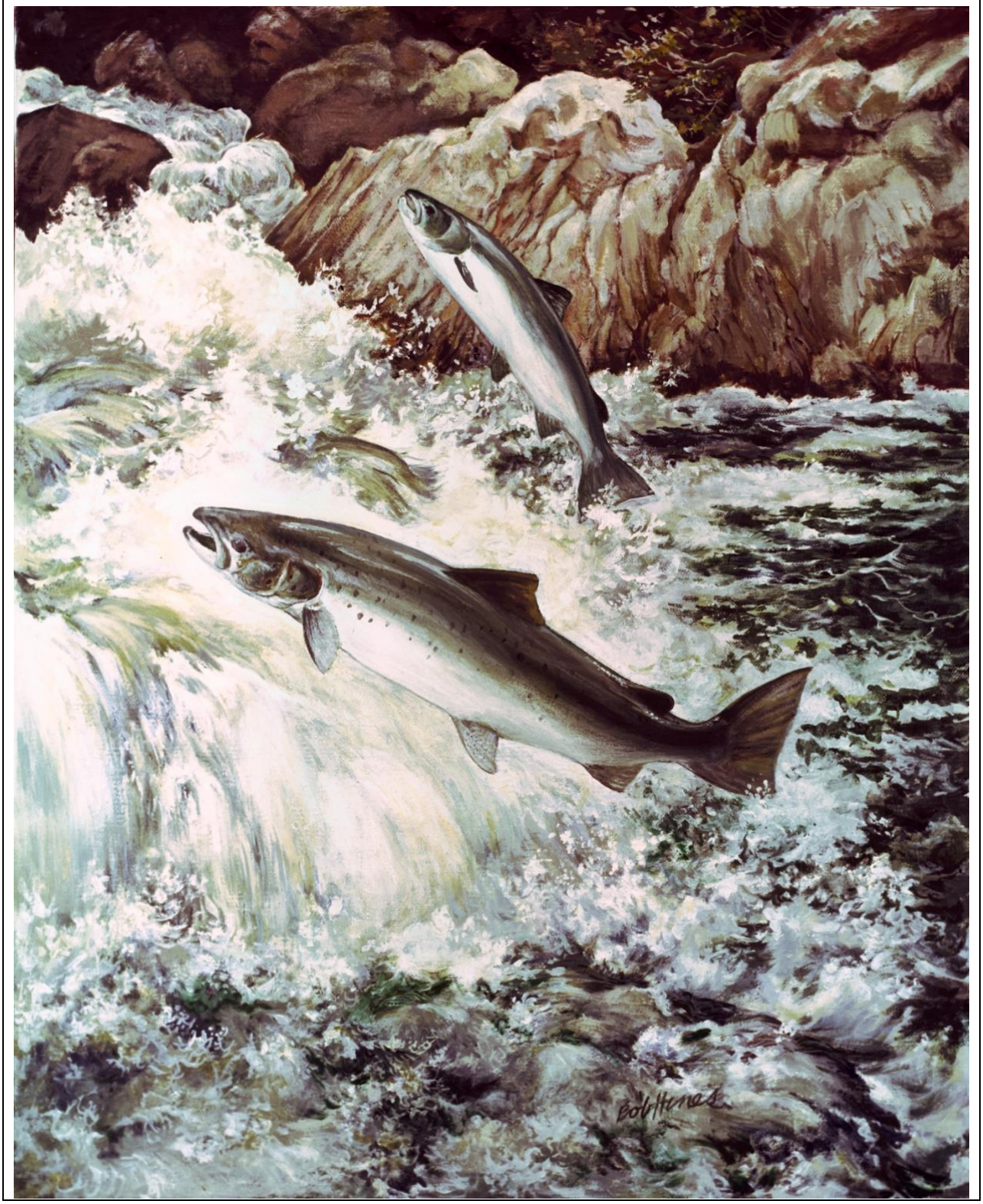
You can suggest to students if they would like to cut their string 6-inch string at varying lengths so that when attached to the plate they can illustrate that features such as aquatic plants would be farther down on the mobile habitat where the water could be close to the top of the mobile to indicate that the water is covering the remaining following items on the mobile habitat.

6. Hang mobiles around the classroom as students can enjoy the concrete examples and see a display of a successful Atlantic salmon habitat and the conditions that make a healthy habitat for this fish they are studying.

Example of Atlantic salmon habitat:



Example of Atlantic salmon habitat:



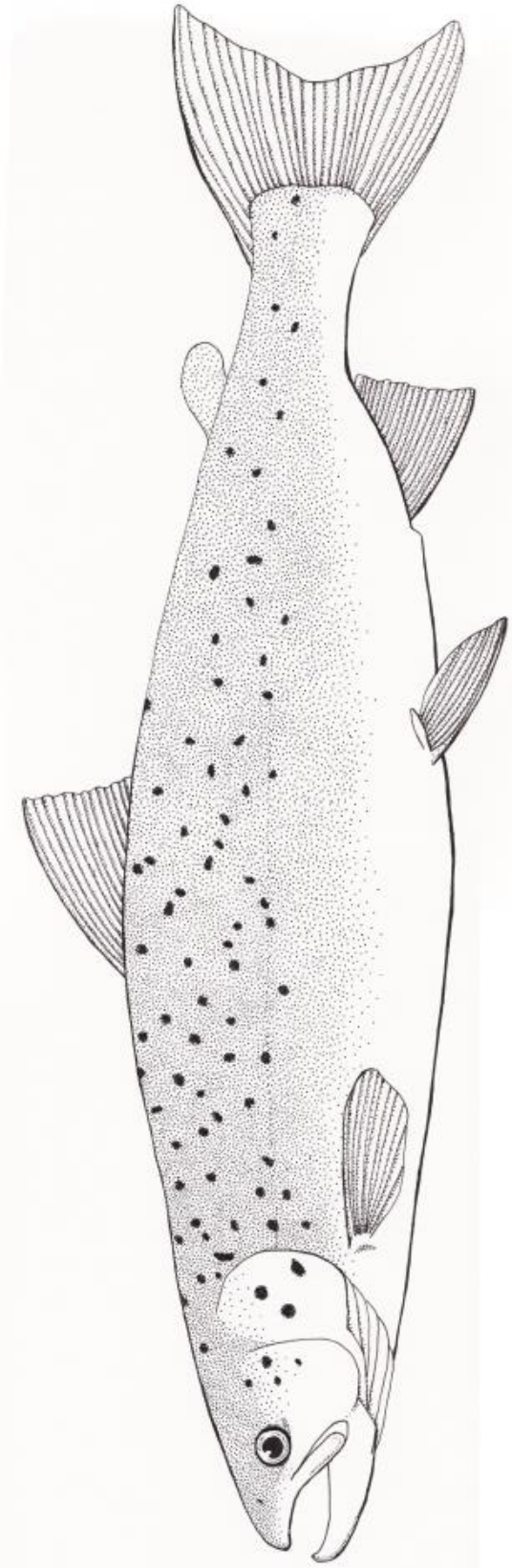
Example of Atlantic salmon habitat:

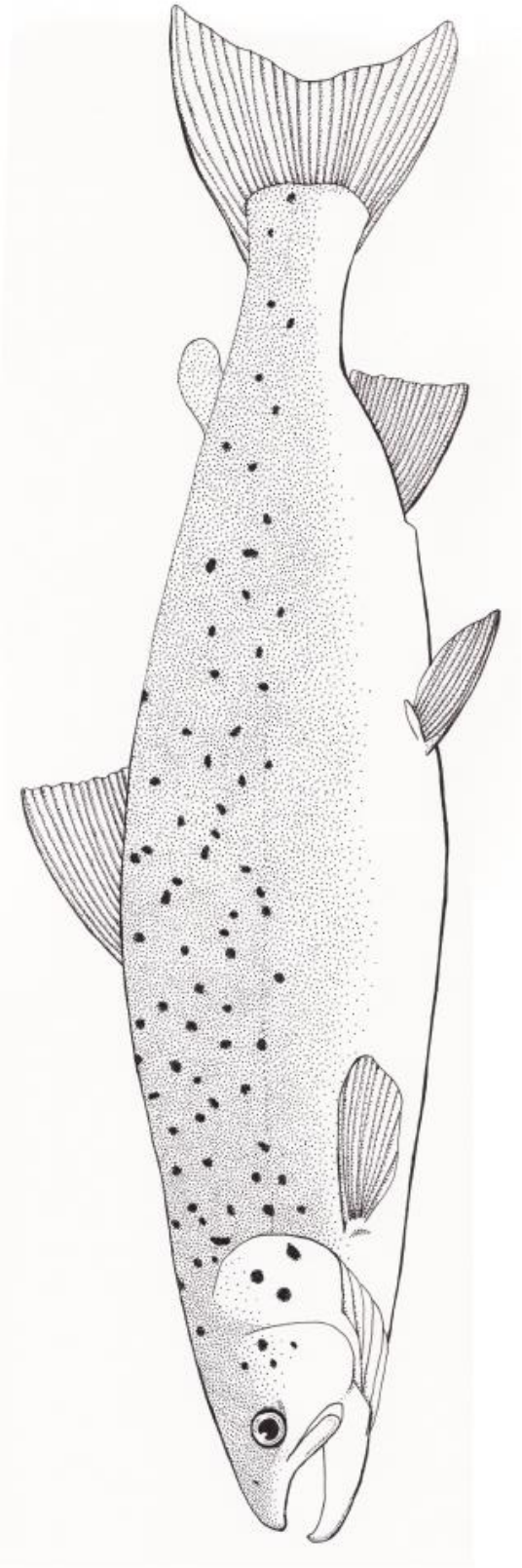
Example of Atlantic salmon habitat:

Key features of Atlantic salmon habitat.

What to do: Cut out each of the key features to be attached to the 6-inch string on your mobile to label your illustrations and images to complete the mobile habitat.

Atlantic Salmon Habitat	Feeds on: stoneflies, mayflies, caddis and some even eat unguarded salmon eggs. In the ocean they eat smaller fish, shrimp, squid and eels
Clean water above 25° C.	The stream bottom is best when it is stony and has course sand and gravel to large boulders
Atlantic salmon return to the stream for spawning	Female Atlantic salmon create a redd or nest in the rocky bottom of the stream to deposit the eggs in a safe spot





Grade 6 Classroom Hatchery Activities

Lesson 15 Atlantic Salmon Life Cycle Puzzle and Mobile

As adapted from Fish Friends curriculum

Setting:
-Classroom (with a large enough area for groups of 2 or 3 students to piece together Life Cycle puzzle)
-Desks or work area to be able to create Life Cycle mobile

Objectives:
Through a hands-on activity, partners or groups of 3 will learn about the different stages of the life cycle of the Atlantic salmon and try to place the stages in the correct order through a puzzle activity. Following the ordering activity, students will create a visual representation of the life cycle that displays the life cycle of the Atlantic salmon as well as create a concrete example that can be displayed in the class demonstrating their learning and understanding.

Materials:
-Salmon Life Cycle puzzle pieces (attached)
-Ziploc bags or envelope (to place Life Cycle puzzle pieces in)
-Laminator (optional)
-Salmon Life Cycle puzzle and envelope (1 envelope per 2 or 3 students)
-Atlantic Salmon Life Cycle visual (a few copies per group of 2 or 3 students) (Attached)
-Paper 8.5`` x 14`` long
-Atlantic Salmon life cycle illustrations (attached)
-Rulers
-String (2 pieces of 30 cm string)
-Glue or tape
-Hole Punch
-Scissors

Preparation:

1. Print 1 copy of the Salmon Life Cycle puzzle (attached) for each pair or group of 3 students. You can laminate each puzzle piece after cutting them out for future reuse.
2. Once all the puzzle pieces have been cut out (and laminated if you choose), place all the pieces into an envelope or Ziploc bag so that each pair or group of 3 students have their own Salmon Life Cycle puzzle

Procedure

1. Provide each pair or group of 3 students with the Salmon Life Cycle puzzle pieces. Students are to find a place that will provide enough space for them to put the pieces of the Life Cycle puzzle in order. Students will read each description carefully and then put each stage in the life cycle in the correct order. Accommodations for this activity can include use of the images for visual cues for low or non-readers, students then can use the images to compare the size difference between each stage. Focusing on the key highlighted words can also provide ease of comprehension: for example “eggs” come before the fish becomes an “adult”.
2. Allot approximately 15-20 minutes for students to solve the life cycle puzzle. Foster the discussion with the students enquiring about what the proper order of the life cycle of the Atlantic salmon. You

can provide partners or groups of 3 with the Atlantic Salmon Life Cycle illustration to allow them confirm they have placed the puzzle pieces in the correct order.

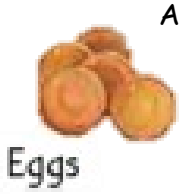
3. Following the completion of the Salmon Life Cycle puzzle students will create a hanging mobile that outlines the stages of the Salmon Life Cycle. Folding the 8.5`` x 14 page in half (lengthwise) and cutting them apart, to create two strips of paper, students will tape one end of the 8.5`` x 14`` strip to the other strips end in order to create one long strip of blank paper.
4. Using the information they have learned during the puzzle activity and referring to the illustrations, students will cut out their own copies of the Life Cycle illustrations and glue them onto the long strip of blank white paper.
5. Once all of the life cycle illustrations have been affixed to the white paper strips, students will tape the ends of the paper length together so it forms a circle to illustrate the never-ending circle of life.
6. Once all of the Life Cycle illustrations have been affixed to the paper, students will punch holes in the top of the picture and attach string so that it can be hung for display in the class.

Salmon Life Cycle

A salmon goes through many changes as it grows and becomes an adult. These changes are part of its life cycle. The stages are described but the order is mixed up. Reading each description carefully, place the pieces together in the right order.

Until the fish become approximately 12-24 centimetres in length, it is called a **parr**. A parr has a dark back with nine to eleven bars, called parr marks, along its sides. A single red dot occurs between each pair of parr marks. These markings help camouflage the parr while it lives among the rocks and weeds of the river.

The small fish, about two centimetres long, is called an **alevin**. It feeds on the yolk of the egg from which it has hatched while it is still in the gravel. The yolk is contained in a yolk sac attached to the belly of the fish.

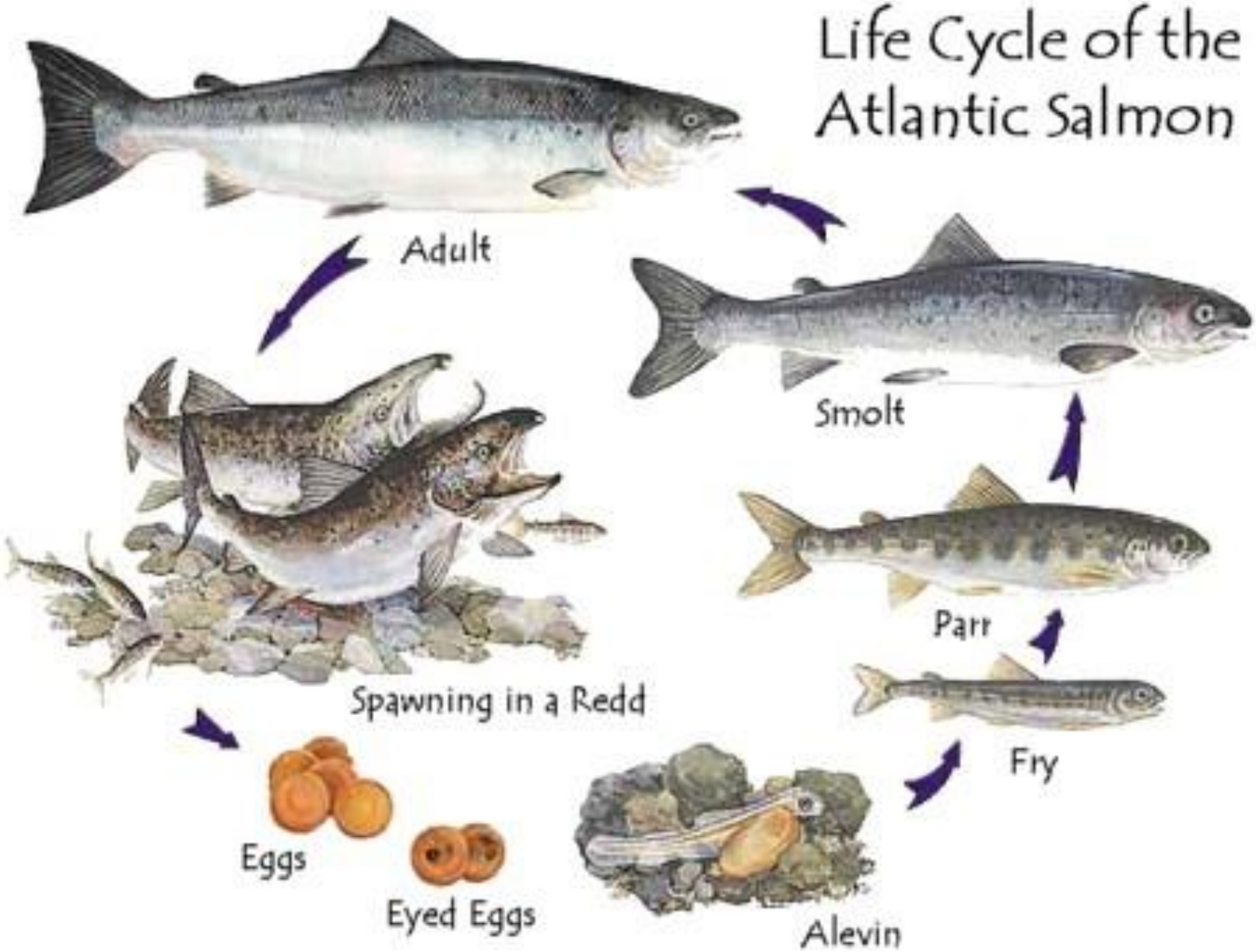


A female salmon lays approximately 1500-1600 **eggs** per kg of her weight. A fish of 5 kg would lay 7,000-8,000 eggs.

As the eggs develop, the eyes of the developing Atlantic Salmon can be seen through the semi-transparent membrane. This stage the eggs are called **eyed eggs**.

 When the yolk sac is nearly gone, the tiny salmon wriggles its way up through the gravel out into the stream. Now it will feed on microscopic materials in the water. It is finally on its own. Until the young fish is five to eight centimetres long, it is called **fry.**	Some salmon spend two,  three or even four years in the ocean. They may weigh from 4 to 20 kg. They return as **adults** to the river where they were born. They then spawn, completing another generation and continuing the life cycle.	An amazing change takes place.  The marks and spots disappear and the fish becomes gleaming and silver. It is now called a **smolt**. It swims swiftly down the river, heading to ocean where its silvery colour will protect it. It is dangerous for the fish to enter the ocean with brightly coloured stripes and spots!

Life Cycle of the Atlantic Salmon



Atlantic salmon life cycle illustrations

What to do:

1. Fold the 8.5`` x 14`` page in half (lengthwise/ longest side to longest side) and cut them apart, to create two strips of paper.
2. Tape one end of the 8.5`` x 14`` strip to the other strips end in order to create one long strip of blank paper.
3. Using the information you have learned during the puzzle activity and using the illustrations, cut out your own copies of the Life Cycle illustrations and glue them onto the long strip of blank white paper in the correct order of the Atlantic salmon Life Cycle. Be sure to leave space in between each illustration. In the blank space between each picture: write down key information about each stage of the life cycle using the information from the puzzle.
4. Once all of the life cycle pictures have been glued to the white paper strips, tape the ends of the paper length together so it forms a circle to illustrate the never-ending circle of life.
5. Once you have created a circle out of the strip of paper with the life cycle pictures attached, use a hole punch to make four holes spread equally apart at the top of the circle on opposite sides of the circle. Attach the two strings to each hole and tie the end of the loose string together so that it can be hung for display in the class.