

It's A Trout's Life

This activity is part of the **Water Protection** theme

What's the purpose of this station?

This activity centre will help familiarize students with different developmental stages of rainbow trout and the associated habitats. This station will increase the students' understanding of some of the challenges fish face as they grow and the difficulties which they must endure as adults.

Key Messages

- Fish undergo various stages of development and use a diversity of habitats throughout their life cycle to overcome specific survival challenges
- Fish are complex species that have specific habitat requirements at various stages of their development
- Understanding of why all habitats have limits to the number of plants and animals they can support.

Materials

Permanent:

- Large game board
- Laminated Condition cards, 2 sets of 20 cards
- Fish Tokens – 200 Poker chips
- Big die
- Props for children to put on when they change stages
 - Egg → Alevin, birthday Hat or a "yolk sac" that they can tie around their waist
 - Alevin → Fry, fish tail
 - Fry → Fingerling, Fins (children's flippers)
 - Fingerling → Smolt, fish head hat

What will I be doing?

Your role will be to explain, supervise and monitor the game. Throughout the game you will explain the different life stages as students reach them. When all children have made it through the game, or there is only a few minutes left you will initiate a discussion about the life of an adult trout. Use the bolded questions to initiate

discussion.

- 1- Explain to the students that the object of the game is to move downstream to the lake, going through each stage in the trout's life to become an adult.
- 2- Explain the game and it's rules:
 - The students will act as life size pieces of the game board. They move through the game by rolling the dice and moving themselves the number of spaces as indicated on the dice.
 - If a student rolls a five or a two, the student moves that number of squares on the game board, then chooses a condition card from the volunteer.
 - If a student rolls a six or a one, it means that one of their fish has been eaten by a predator. The student will stay on the square where they are and put a fish token in the Mortality Zone.
 - Every time a student changes into a new development stage (egg into alevin, alevin into fry, fry into fingerling, fingerling into smolt), they take an appropriate prop from the prop table and wear it for the rest of the game
 - If a student loses all of their Fish Tokens before finishing the game, they hand in props, and have to start the game again with 5 new fish tokens.
- 3- Ask the students to move to the egg symbol to start the game. Give each student 5 Fish Tokens (poker chips).
- 4- Have each student roll the die. The highest roll goes first.
- 5- If a student rolls a five or a two, the student moves that number of squares on the game board, and then chooses a condition card from the volunteer. The Volunteer reads the condition card to the student and the student follows the instructions or answers the question. If the student gets a question card and answers it correctly, they move ahead one space. If the student gets a question card and answers it incorrectly, they move back one space.
- 6- Once the first student finishes the game and becomes an Adult Trout, they take on the predator role. Explain their role to the whole group:
 - They hand in all of their props and sit in The Deep zone

- Explain to the students that as adults they spend most of their time in deep water, but their food, the smaller fish are in the shallower water. To get their food they must pay attention to the other students as they roll the die and move along the game board
- When one of the players rolls the die, the adult fish has that many seconds to stand up and run to the square where the other player needs to move to. If the adult fish gets there before the player, you have eaten the smaller fish and you take one of their Fish Tokens

- 7- Play the game until all students have made it to the lake and become Adult Trout **OR** time runs out
- 8- If there is some time left, initiate a discussion with the following questions:

What are some of the main challenges in your journey to adulthood?

From the very start trout is dependent on its habitat for survival, as they require cold fresh water streams to hatch and grow. Small trout are also faced with the continued threat of predation (being eaten) from other fish or birds.

What do adults have to deal with to survive?

Adults have challenges, which they need to face from day to day. Finding food, disease, spawning, finding appropriate habitat, predators while they are in the shallows, Changes in water quality, temperature and pollution.

What can people do to help trout's chances of survival?

By helping to maintain a healthy environment for the fish. Trout eggs need a good oxygen rich flow of fresh water to develop and different healthy habitats are also essential for trout to successfully reach adulthood. We can all help by not polluting, conserve water and by respecting the trout's natural environment.

What is carry capacity? Can you apply it to trout populations?

The ability of species such as trout to increase their population is dependant on food and habitat availability. The carrying capacity is the ability of any habitat to support a certain amount of individuals. When the population size (ie trout populations) is smaller than the carrying capacity, the populations will increase, however when the population is to big to be support by the carrying capacity then the population will decrease in size. Eventually these fluctuations in population size will

balance when the population equals the carrying capacity.

Additional Background Information

Fishes often change their appearance, behaviour and habitat as they go through the stages of maturing. The rainbow trout is a good example of a quick-change artist fish.

Rainbow trout begin life as tiny orange-coloured **eggs** in fine gravel nests in cold-water streams. The cold flowing water keeps the eggs supplied with oxygen and removes waste gases. In four to seven weeks, the eggs hatch. The little rainbow trout are on their own from the beginning because the adults leave after the eggs are laid. Each tiny rainbow trout at this stage is called an **alevin** and has a little sacs of egg yolk still attached to its body. The alevins feed on this yolk for about a week while remaining inactive in the bottom gravel.

When their yolk is used up, the little rainbow trout alevins become **fry**, and leave the bottom gravel to actively feed in the stream above. The fry seek the shelter of rocks and logs quickly, and only move into the open stream waters to capture small insects and plankton that are carried along by the current.

Near the end of the first year of life fry become **fingerlings**. The first year of life is a very dangerous time for the young rainbow trout as they risk being eaten by larger fishes, birds (such as herons and kingfishers) and mammals (such as otters).

As the rainbow trout continue to grow, they are called **smolts**. In some streams, very young smolts swim downstream to the Great Lakes as soon as they are able. Many rainbow trout, however, stay in their home stream for one to three years until they are 10 to 20 cm long, before moving downstream into the lake environment.

Once in the lake, the rainbow trout feed on a wide range of plankton, insects, snails, leeches and (as rainbow trout get bigger) other fishes and their eggs. They may grow up to 10 kg in weight.

In the spring, after the ice has thawed and the water has warmed up, the mature rainbow trout leave the lake and begin their journey back into the stream or river to **spawn** (lay their eggs). Often they choose the same river where they were hatched. These muscular fish need all their strength to fight against the strong current and sometimes can be seen leaping over small waterfalls and dams that block their way. The rainbow trout search for a place where the water is cold and flows quickly and the bottom is covered with small stones or gravel.

Once the right spot is chosen, the female rainbow trout lies on her side and flips her tail quickly to dig a small hole or nest in the gravel called a **redd**. A male joins her and the two stay side by side over the nest. She then releases up to one thousand eggs into the water and the male releases a milky cloud of **sperm** or **milt** over the eggs. The fertilized eggs settle into the redd and the female moves her tail again to cover the eggs with a layer of small stones to keep them from being carried away by predators or current. The adult rainbow trout then leave the stream and return to the lake, leaving the next generation of rainbow trout to begin their lives.

Clean Up procedures

Gather and count condition cards to ensure a full set
Gather and count Fish Tokens (poker chips) and put them in container provided
Wipe down game board.

