

Moving through the Trout Life Cycle

Description:

Using physical movement students will explore the life cycle of trout. This activity will introduce students to the interconnectedness of our environment and demonstrate how stream health and water quality directly impacts a trout's life cycle and ability to thrive.

Objectives:

- Connect the cyclical nature of a trout's lifespan to watershed health and water quality
- Learn the order of the stages of a trout's physical development and reproduction
- Understand how factors such as temperature and dissolved oxygen impact the phases of a trout's life cycle

Vocabulary:

Alevin, benthic macroinvertebrates, dissolved oxygen, eyed egg, fingerling, life cycle, macroinvertebrates, parr marks, plankton, redd, spawn, trout, water quality, yolk sac

Materials:

- Writing utensil and paper
- [Trout Yoga Instructional Video](#) by DEP
- Trout Life Cycle Yoga Script

Background Information:

Throughout their approximately 6-year lifespan, trout live a unique but consistent life cycle that demonstrates the need for healthy water systems. To complete a life cycle, trout require

clean, clear, and cold water with high dissolved oxygen (DO) levels to support their various life stages. From egg to adult, the trout life cycle helps us understand the impact water quality has on wildlife.

In the fall, mature female trout use their tails to dig out a nest in the gravel, called a redd. Once the redd is complete, the mature female typically lays between 500 – 1,000 eggs above the redd as a mature male trout fertilizes them. After fertilization, the eggs remain in the redd for the extent of their development, using the flowing water to supply DO.

After two weeks of development, the eggs develop eyes which are visible through the walls of the egg. The embryo develops, getting nutrients from the yolk and a supply of oxygen by the movement of the river. After eight weeks, a small fish emerges from the egg, with the yolk still partially attached. The little fish relies on the yolk for nutrition and at this stage is referred to as an alevin or sac-fry. As the yolk sac dissolves, the alevin moves and explores more and more, until the sac is completely absorbed.

The little trout then begins to feed on plankton and benthic macroinvertebrates. At this new stage, they are now called fry or fingerlings. Fingerlings have stripes called parr marks on their sides, which help them camouflage themselves to escape predators. Because of these parr marks, older fingerlings are also called parr. After two to three years, the trout reaches maturity with factors such as temperature, DO, and water quality all impacting the rate at which it grows.

Method:

- Introduce students to the trout life cycle through A Trout's Life Cycle presentation and/or the Connecting the Trout Life Cycle lesson. As you move through the presentation, write vocabulary words on a whiteboard (or ask students to identify potential vocabulary words and write them down in notebooks).
- After using the presentation to share vocabulary words with students and the overarching cycle of a trout's lifespan and reproduction, begin the trout lifecycle yoga activity. You can reference or use the [Trout Life Cycle Yoga Video](#).
- **Note:** Students should begin the activity standing. They can make sure they have enough space by reaching their arms forward and to the sides to make sure they aren't touching classmates or objects. Ideally this activity can be done outside or in a large open room such as a gym or cafeteria, or outdoors.
- Refer to the script and follow along with the video, leading students through the trout life cycle through physical movement.
- As students go through the movements make sure to highlight vocabulary words or key points in the trout life cycle.
- After completing the video, ask students to complete a creative reflection activity.
 - For example, students can write a story or poem following a particular trout's journey through the life cycle.
 - Other reflective activities could include drawing a picture, creating an interpretive dance, or another form of creative expression.

Discussion:

- Why do you think trout reproduce in specific seasons?
- Looking at our trout, what phase of the life cycle are they in right now? What phase will they be in next?
- Can you think of other species that may have a similar life cycle to trout?
- How do you think dissolved oxygen or temperature can impact a trout's ability to grow?
- How might a trout's life cycle differ in their natural environments compared to in fish hatcheries or TIC tanks?

Extension:

- Break students up into small groups to design a skit from the perspective of a trout moving through the life cycle.
- Have students research and compare a trout's life cycle to another freshwater fish found in NY waterways, or to macroinvertebrates.
- Ask students to complete a KWL (What I Know, Want to Know, Learned) chart for vocabulary words. Students can research terms they are not familiar with.
- Share these GIS resources with students and encourage them to explore the range and conservation status of trout:
 - [Brook Trout Conservation Portfolio and Range-wide Assessment \(arcgis.com\)](#)
 - [Brook Trout Atlas - Stream Temperature - Overview \(arcgis.com\)](#)

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For more information visit www.nyc.gov/dep

Trout Life Cycle Yoga Script:

(Refer to [video](#) for a guide)

"The river begins in the mountains. It starts as snow and rain and springs bubbling up out of the ground." - Mountain pose (standing with arms reaching up toward the sky).

"The river comes down from the mountain." - Sway arms back and forth.

"We've reached a faster part of the river, a riffle!" - Bring arms up while swaying, begin patting up one arm.

"As we pass over rocks in the river, oxygen from the air get incorporated into the water. We can breathe oxygen into our riffle. Breathe oxygen into your riffle with me." - Pat up other arm, saying puh puh.

"Now we come to a calm point in the river." - Begin swaying arms again.

"We're going to flow all the way down the mountain." - Bring swaying arms down into forward fold.

"Oh look! There's a place in the gravel that looks swept clean! We've found a redd. The female trout's tail swept the gravel clean to make a nest for her eggs." - Sweep ground with hands.

"If we look even closer we can see some eggs in the redd. Let's turn ourselves into one of these eggs." - Roll into a ball and put head between knees.

"We start to develop. We can rock to show we are growing inside our egg." - Begin rocking.

"Our eyes come out and we become eyed eggs! We look up and start looking at the world from inside our egg. We see hundreds of our sibling eggs." - Frog pose (kneeling with knees outside elbows) and look around. If this is difficult, you can sit criss cross applesauce and look around.

"Now we hatch!" - Throw arms to sides.

"We can breathe the oxygen in the water with our new gills." - Bring hands to cheeks and breathe in and out while moving hands like gills.

"But we still have our yolk sac attached! We are alevin now." - Move hands up and down to denote yolk sac.

"As we grow and develop into fry, we absorb our yolk sac." - Stand up and run hands up body to show yolk sac absorption and bring hands together at chest.

"We're swimming and exploring the river." - Sway back and forth with hands clasped.

"We start to get hungry without our yolk sac! We swim up to the surface looking for food." - Move hands to face level and continue swaying.

"We grow bigger and bigger, and gain stripes on our side called parr marks. We are now called a parr." - Sway side to side and swipe hands on sides. Return hands to face level and sway.

"We eat so much we grow and grow until we become a grown-up trout!" - Move hands up and up while swaying to show growth.

"Now we are an adult trout, and we want to reproduce and have trout babies of our own! Se we are going to make a nest." - Forward fold and sway.

"We sweep the gravel to make our redd, the nest where we lay our eggs." - Sweep ground with hands.

"A male trout fertilizes our eggs with his milt." - Wiggle fingers.

"And so the life cycle of a trout begins again! And the river keeps flowing through all the life cycles." - Sway arms and unfold.