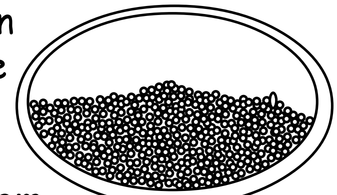
Eggs! Eggs! Eggs!

Where Your Trout Eggs Come From



Hatchery fish have a much better chance of survival than wild eggs and fry do. One of the reasons is that eggs are taken and fry reared under controlled and protected conditions.

In Nevada (see the map page 21), trout eggs come from three sources: Wild streams, hatchery brood stock or other hatcheries. Wild eggs may be taken at places like Marlette Lake, near Lake Tahoe, Big Springs, in Humboldt County and Catnip Reservoir, in northern Washoe County. Brood stock are used in Gallagher hatchery (near Elko) to supply eggs for Gallagher and Spring Creek Rearing Station (near Baker). Eggs used in Lake Mead hatchery are purchased from a hatchery in Montana.

It's necessary to trap the fish if they are wild. Using the natural instinct to swim upstream and spawn, biologists and hatchery workers, "funnel" the fish through chutes into an underwater pen. The trapped fish are sorted, males and females into separate pens, so that they won't spawn in the confinement of the trap or pen. "Green" females become "ripe" when the egg sack breaks loose at the touch and the belly is flaccid. Males are ripe during the entire six-week spawning period.

The fish are anesthetized for ease of handling and to reduce the stress on the fish, by dunking them in water mixed with a mild anesthetic. The fish are rinsed in clean water to keep anesthetic from getting on the eggs. The female is "stripped" of her eggs by squeezing the belly down to her vent and the eggs pop out in a steady stream. A 13-inch female trout will produce about 1,000 eggs. A male (one per female in each batch, to insure genetic diversity) is squeezed down to squirt milt (sperm) onto the eggs and the entire concoction is mixed with clean water for hardening up. Spawning is done in the shade as exposure to direct sunlight will almost immediately kill the eggs.

Green Eggs In Gravel

Green Eggs - No Ham

Freshly laid and fertilized eggs go through a process called water hardening, in the first hour of being laid. During this hardening process, the sticky new eggs absorb water and become firm, until the micropore seals. These green eggs are very sensitive to being jarred and exposure to light. They are generally hauled dry to hatcheries in cheesecloth or egg trays with ice melting down on them. They can last this way for about 24 hours until they reach the hatchery, where they need to be kept in complete darkness with cool, running, well-oxygenated water.

Eggs! Eggs! Eggs!

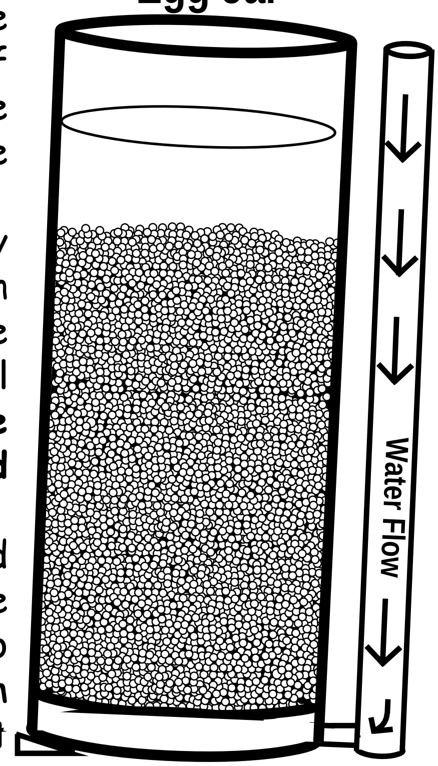
Eyed Eggs In Gravel

We've Got Our Eye on You!

As the eggs develop (about 20 days after being spawned), a recognizable set of eyes begins to develop in the embryo. The eyes are clearly visible through the egg shell. Until this time, the eggs must remain untouched, in complete darkness. Once the eggs have eyed-up, there is a very brief period of time when they can be moved. Eyed eggs are stronger than green eggs, but still very fragile. Even a small bump can kill these new eggs, so gentleness and handling only when necessary is advised.

It's during this time that the eggs will be distributed. Teachers will be notified in advance of the day and time of egg distribution. The dates and times will also be posted on the NDOW website, on the TIC page. Eggs will be delivered from the hatchery to central points of distribution, where the teacher or the tank-buddy can pick them up. There is a "safe time" of approximately 24 hours, from the time the eggs are boxed-up at the hatchery until they need to be in the dark, cold water of your incubator.

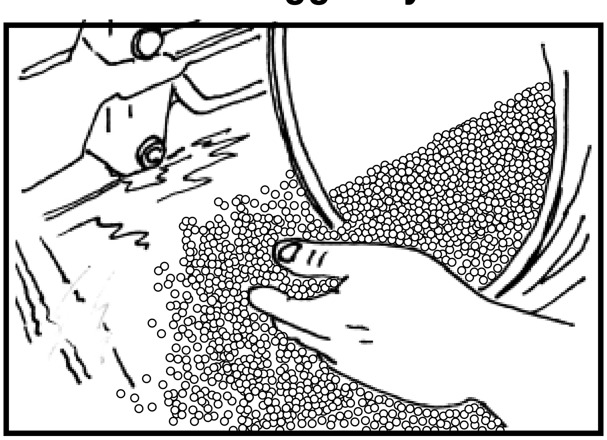
Egg Jar

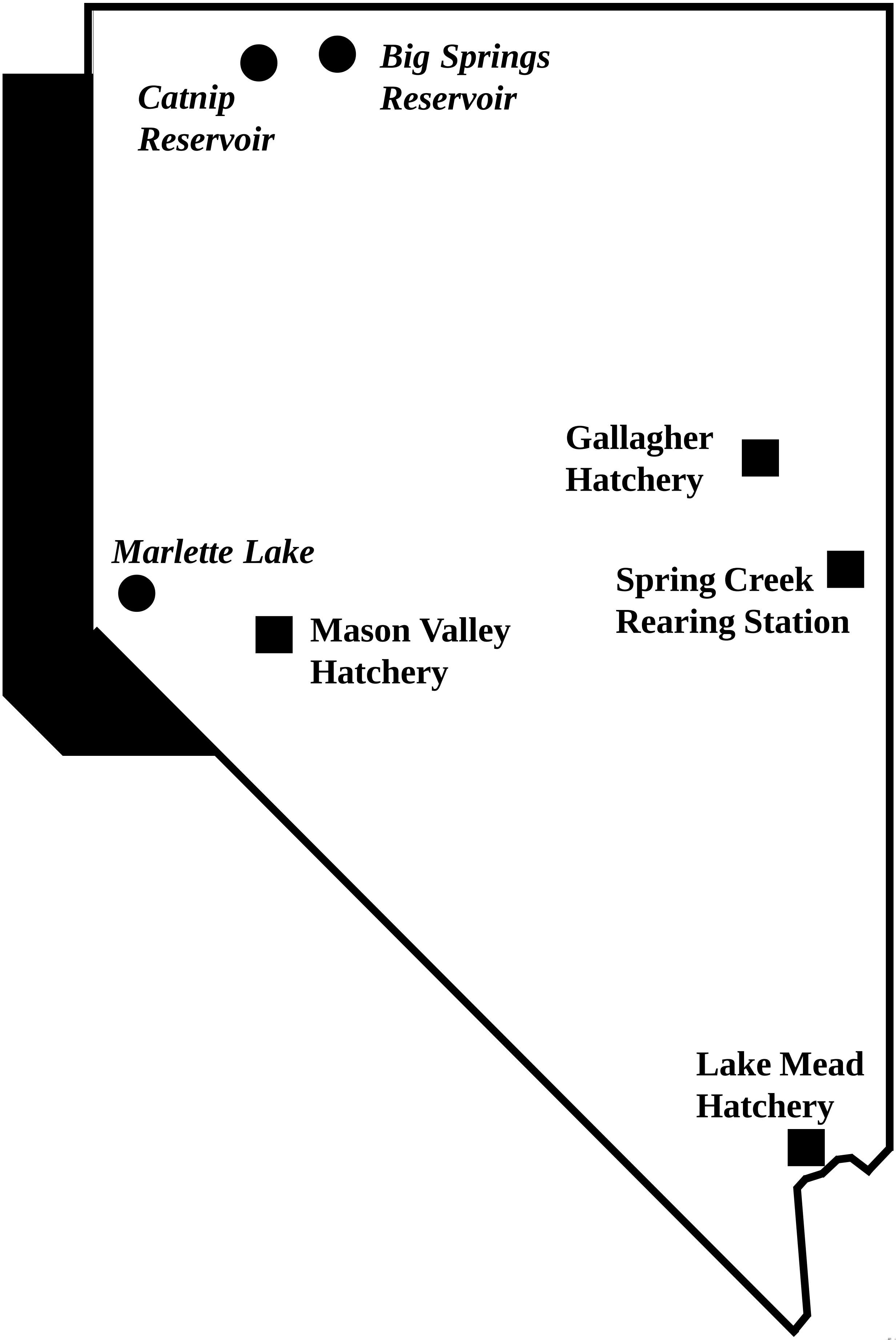


Eggs are not transported in water as they will quickly use all the oxygen. Your eggs will be carried in cheesecloth with ice melting down over the eggs. The eggs must be kept cool and moist, but not in water, until you get them to your classroom. **Please bring the aerated bait bucket, a small cooler or other insulated waterproof carrier to transport your eggs.**

When the eggs arrive, carefully unwrap them and allow them to drift to the bottom near the front of the aquarium. Remember, do not expose them to fluorescent lights or direct sunlight. Fifteen minutes of exposure can kill eggs and fry. In nature, the eggs are not exposed to sunlight while buried in the gravel.

Heath Egg Tray



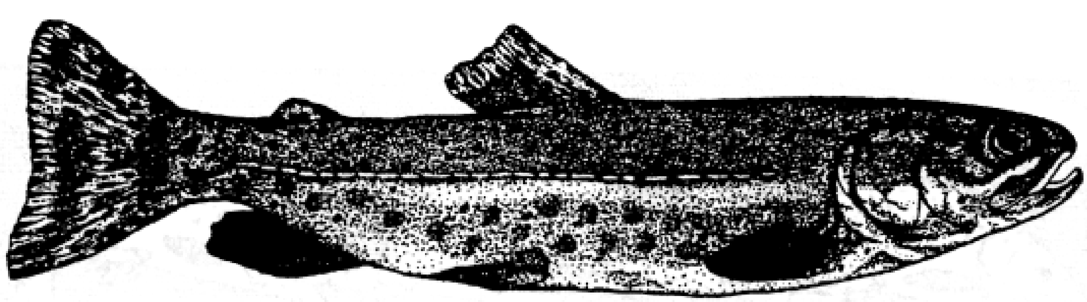

Big Springs Reservoir
Catnip Reservoir
Gallagher Hatchery
Marlette Lake
Spring Creek Rearing Station
Mason Valley Hatchery
Lake Mead Hatchery

APPROXIMATE DEVELOPMENT RATES

Rainbow Trout

	Days	Temperature Units
GREEN EGGS	1 (Date Spawned)	0
EYED EGGS	16	352
ALEVIN	23	506
SAC FRY	41	902
FRY	59	1300

* All date and temperature unit estimations are based on water temperatures at a constant 54° F. Variations may occur with different species or stocks of fish and as a result of temperature fluctuations in your incubator. This information is intended only as a guideline.



When Will They Hatch?

Students predict when their fish will hatch and when the alevin will swim out of the gravel. They monitor temperature daily, calculate actual Thermal Units (TU's) and compare with predictions.

Materials:

- Thermometer
- Calendar
- Student Worksheets
- Transparency of TU Chart
- Calculators

Salmon and trout eggs develop at a rate that is partially determined by water temperature. Water at temperatures preferred by salmon may feel pretty cold to us, but it still contributes thermal energy to the developing embryo. This energy is measured in thermal units. When the embryo has accumulated enough thermal units, it hatches. The number of thermal units it needs depends on average temperature. Eggs in very cold water will take considerably longer to develop because there is less heat energy available and because they must accumulate more heat energy (thermal units) overall to hatch. Note that the temperature range is limited. Optimal temperatures are about 40 - 55 degrees F. Eggs will survive temperatures close to freezing, but develop very slowly. If the water is too warm, the eggs die.

1 TU = 1° F above freezing (32°) for 24 hours

Example at 52°: 52-32 = 20 20 TU's will accumulate each day (24 hours)
Over a 5 day period, 5 x 20 = 100 TU's will accumulate.

For Steelhead and Rainbow Trout

Water Temperature ° F	Approximate Days To Hatch	Thermal Units Accumulated
40°	80	640
45°	48	624
50°	31	558
55°	24	552
60°	19	532

At 45° - 50° F	Chinook Salmon	Coho Salmon
TU's To Hatch	900 - 950	750 - 850
TU's to Emerge	1500 - 1550	1250 - 1300

When Will They Hatch? Sample Calculation

Here is a hypothetical calculation for predicting the hatching date. This is a simple exercise. Don't let the units confuse you, they are an important part of problem solving and can help students check their answers.

Not every calculation is prompted by the worksheet. (You must subtract 32° from water T and you must divide to determine how many days it will take for the required T.U. to accumulate.) Walk students through the logic of the problem and help them determine what operation (i.e. count, add, subtract, multiply, divide) is required at each step.

1 T.U. = 1° F above 32° F for 24 hours
T is the abbreviation for temperature.
T.U. / day means thermal (temperature) units per day. It equals average T− 32°

Hatchery Data:

Spawned on	January 3
Arrived in your room	January 24
Total days at hatchery	21 (**Count** or **subtract**)
Average hatchery water temperature	52 (Ask hatchery manager)

T.U./day = 52° − 32° = 20 (**Subtract** to find T.U. per day.)

20 T.U./day **x** 21 days = 420 T.U. (**Multiply** to find T.U. accumulated at hatchery)

In The Classroom:

Total T.U. required for hatching	558 (Refer to chart, page 24.)
T.U. at hatchery	− <u>420</u> (**Subtract**)
T.U. still needed	138

Average daily temperature has been 51° (Monitor T in your aquarium before eggs arrive.)

This means that 19 T.U.'s will accumulate each day. (51° − 32° = 19 T.U.)

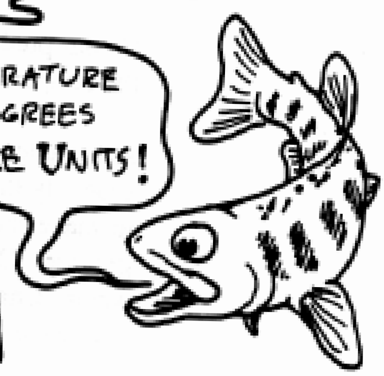
Our fish will hatch in: 138 T.U. ÷ 19 T.U./day = 7.26 days
(**Divide** the number of T.U. still needed by the number of T.U. per day that will accumulate in your aquarium.)

Challenges: What if the eggs were moved from one hatchery to another and were kept at different temperatures at each hatchery? How would you adjust your calculations?
How would you convert .26 days to hours?
What factors might be at play if your prediction proves to be a little off?

When will they hatch?

__________ need __________ T.U. to hatch.

Hatchery Data:



Date eggs were fertilized: __________

Date eggs arrived in your room: __________

TOTAL DAYS spent at hatchery [ ]

Average hatchery water temperature [ ] °

[ ] T.U./day × [ ] days = [ ] T.U.

In The Classroom:

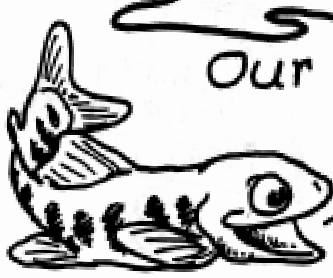
Total T.U. required for hatching: __________

Temperature units at hatchery: __________

Temperature units still needed: [ ]

→ Average daily temperature has been: [ ] °

This means that [ ] T.U. will accumulate each day.



Our fish will hatch in [ ] days!

The date will be: [ ] !

Procedure:

You will need to know when the eggs were spawned and what the average water temperature was at the hatchery. Be sure to ask the hatchery manager, or the program coordinator who delivers your eggs, for this information. Also, ask the hatchery manager how many TU's are usually required for eggs to hatch and to swim up. The numbers in the charts above are close approximations; there can be slight differences among stocks of fish. The number of TU's required for hatching depends on temperature. At very cold temperatures, more TU's are required than at warmer temperatures.

If your predictions indicate that the eggs will hatch on a weekend, you can reduce the temperature by a couple degrees to delay hatching until a weekday.

Ask students what factors might influence when the eggs will hatch. They will probably think of temperature. Students may be aware that birds sit on their eggs to make them hatch. Body heat is a form of energy and energy is needed for growth. Discuss how fish get energy from their immediate surroundings - the water. Challenge students to think of how they could predict when their fish eggs will hatch.

Students will probably offer comments like, "When they get enough heat they will hatch". Discuss the temperature of your aquarium. You have probably been monitoring this daily during the week prior to getting the eggs. Show students the chart of required thermal units and work as a class or in small groups to determine what information is needed to predict exactly when hatching will occur.

Students should write down all the steps they will take to get their predictions. Help them do this by writing all the relevant information on the chalkboard. Include the date the eggs were spawned, the average water temperature at the hatchery, the average water temperature in your aquarium, the number of TU's required for hatching, and the definition of a T.U.

Students may devise their own way of presenting the information or they may use the worksheet provided.

Each day, record the water temperature. If it changes at all during the day, take two or more readings and find the average daily temperature. Make a chart to show the Thermal Units that accumulate each day.

After hatching, compare your predictions to what actually happened. If the fish did not hatch on the predicted day, discuss the factors that might have been involved.

Watch Us Grow

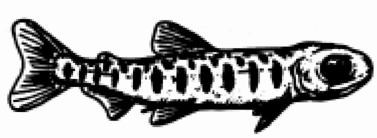
Observe, draw and describe development of eggs, alevin and fry.

Concepts: Growth is a continual process. Salmonids undergo big changes from the time they are embryos until they are adults.

Materials
- magnifying lenses
- petri dishes or other shallow containers (1 per group of 4- 5 students)
- baster
- rulers
- *Eggs to Fry* worksheet - several for each student

The fish you raise will change dramatically during the time they spend with you. Salmon and steelhead eggs go through thirty stages of development, which can be grouped into three phases: cell division, tissue formation and organ formation. Some of the highlights of development at an average water temperature of 51˚ are listed below.

Day 2:	Blastodisc has rounded up and is composed of 3 layers of cells
Day 10:	Eye lenses well developed
Day 11:	Cerebral hemispheres evident, segmentation of hind brain begun, pectoral fins starting to form
Day 15:	Tail becoming symmetrical, eyes becoming pigmented
Day 16:	Four gill buds evident at sides of throat, cerebral hemispheres enlarging, anal fin first noticeable, eggs are past tender period
Day 18:	Dorsal fin begins as faint thickening, nostrils first evident
Day 22:	Ventral fins now evident
Day 28:	Dorsal and anal fin rays visible, hatching begins
Day 30:	Hatching completed



Development of green egg to fry 1. Fertilization 2. Egg swells 3. Cell division starts 4. Eyed stage (cut away view) 5. Hatching 6. Alevin 7. Feeding fry

Unlike eggs, alevin are mobile, since they have fins. However, they are not good swimmers. The fins develop more fully during the alevin stage. Observe the yolk sac shrinking and the alevin taking on a more fish-like appearance as they grow. By the time they emerge from the gravel as fry, they will have obvious parr marks and fully functioning fins.

Swim up may be gradual, and the little fry will frequently dart back into the gravel for security. Gradually, they will spend more time in open water. They will become strong swimmers as they grow larger.

Procedure

To observe fish while they are in the aquarium, students can hold a magnifying glass close to the aquarium wall. This method is the safest for the fish. You may also remove several eggs carefully with your baster. Put one egg into each petri dish, with about an inch of aquarium water. Students should work in groups of 4 or 5. Do this activity quickly, since the small amount of water will warm up quickly, and the eggs could die. Students should not touch the eggs. Keep eggs out for only about 15 minutes.

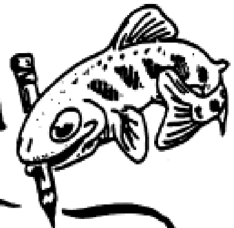
When you replace the eggs, you may put them into an isolated corner of the aquarium, and use the same ones again if you repeat the observation. Watch them closely for signs of injury and remove them at once if they die.

Use extreme care if you remove alevin , since they are very delicate. Again, work quickly, and gently replace the alevin to the bottom of the aquarium. Be sure your hands are clean and free of soap and lotion before putting them into the aquarium. Remove alevin only once. If students observe from outside the tank, be aware that the alevin will move away from light, so be ready with those magnifying glasses. The video, *Miracle of the Scarlet Salmon* has good footage of alevins.

Fry may be removed with a net. They have a higher oxygen demand than eggs and alevin, since they are bigger and more mobile. The water in the petri dish will quickly be depleted of oxygen. The fish are actually easier to observe while inside the aquarium at this stage, so removal may not be necessary.

Students should draw, label and describe what they see during each observation activity. Use the worksheet provided or have students design their own.

Eggs to Fry: A Picture Journal



TODAY'S DATE ________

AGE OF FISH (IN DAYS) ________

DRAW AND LABEL BELOW

DESCRIBE WHAT YOU SEE

____

____

____

____

____

TODAY'S DATE ________

AGE OF FISH (IN DAYS) ________

DRAW AND LABEL BELOW

DESCRIBE WHAT YOU SEE

____

____

____

____

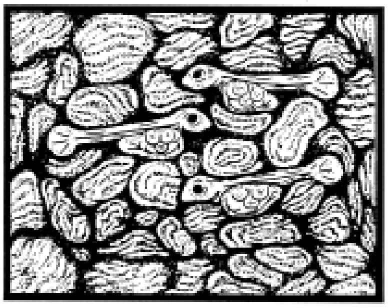
____

BE SURE TO INCLUDE: SIZE, COLOR, SHAPE, BODY PARTS, MOVEMENTS

Early Development

Alevins and Fry

When the eggs hatch, the alevins (sac fry) will swim down into the spaces in the gravel. They will remain there until the yolk sacs are consumed. **Do not feed the fry at this time.** The fry are living off the yolk sac and will not eat what you feed them. Feeding only creates waste which puts the fry in danger of infection and requires unnecessary water changes.

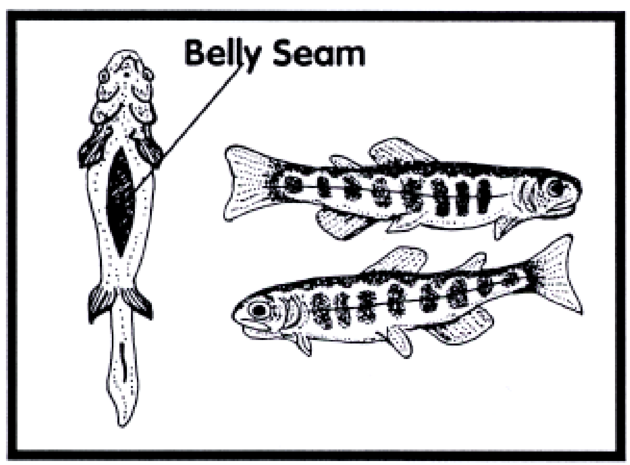


Alevins In Gravel

Alevins are very fragile. Avoid handling them, as the yolk sac is easily damaged. Any dead alevins should be immediately removed and the numbers recorded in the fry column on the daily progress report (see example page 33).

Check alevins frequently to observe the condition of the yolk sac. As the alevin develops, it absorbs nourishment from the yolk sac and the yolk sac shrinks. Watch the seam on the alevin's belly where the yolk sac is attached.

When the belly seam is about one millimeter in width, a small amount of yolk is still present in the body cavity. This amount can sustain the small fish for a short time. place one or two fish in a small jar for a short time to observe the seam width. When the yolk is no longer visible from either the bottom or the sides of the fish, and the seam is less than one millimeter wide, the fish are called **button-up** fry. As the yolk sac is absorbed, fry "swim up" to the surface and begin actively looking for food. This takes five to seven days. At this point, fry are ready for release.



Buttoned-Up Fry

Eggs from different females may be different sizes and mature at different rates, so it might be confusing as to when you should release your fry. Inspecting two or three fry may not give you a representative idea of when the majority of fry are ready for release. You will want at least half to 2/3 of the fry in your incubator to be at the button-up stage and swimming up before you release the fry.

FISH IN ACTION

Observe and describe how fish move, breathe and respond to stimuli

Materials

- Fish in Action Questions
- Magnifying lenses
- Paper, pencils
- Chart of external fish anatomy (from a curriculum, see bibliography)

Fish are well adapted to live in the water. Their shape and fins allow swift, precise movements, they have scales and slime that protect their skin from constantly being in water, they have a lateral line that senses vibrations, and they have protective coloration.

Salmonids use the caudal fin (tail) to propel themselves forward, the dorsal fin on their back to stay upright and the pectorals, pelvic and anal fins for fine tuning the motions. Pectorals have the widest range of motion and are used to stop and turn.

Salmonid eyesight is excellent. These fish can simultaneously see what is in the water and what is on the land. They can see us much better than we humans can see into their world. Migrating salmonids are able to find their home stream because of a highly developed sense of smell. They hear well with their ears. Their sensory perception is enhanced by the lateral line, which can sense very small vibrations and probably magnetic fields. The lateral line helps all salmonids avoid predators, and it helps anadromous salmonids navigate in the ocean.

Fry have dark spots and coloration that help them blend into their stream environment. It can be very difficult to see a fry against a background of gravel. When salmon and steelhead go out to sea, their backs become very dark and their stomachs very light, which helps them escape notice from above and below.

You will most likely observe territorial behaviors and dominance hierarchies among the fry. Some fry may get bigger than the others, because they get more food. This happens in the wild, too.

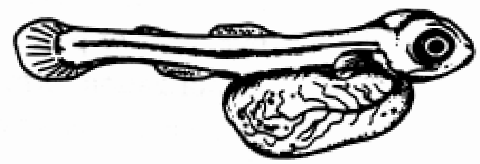
While observing the fish, avoid too much stimuli. Tapping on the glass, quick movements and loud noises may stress the fish and make them more susceptible to illness.

FISH IN ACTION QUESTIONS

Please answer these questions on a separate sheet of paper. Use whole sentences.

ALEVIN

- Describe the alevin. What color are they? Do they have fins? What is most interesting about them?
- How well do alevin swim?
- What do alevin do when light shines on them?
- How might this reaction help them survive in the wild?



FRY

Fins

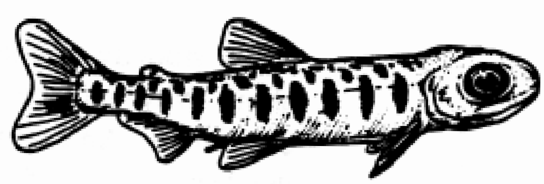
- Observe how the fish move. Try to answer these questions.
- How many fins are there?
- Draw the fish and show the fins.
- Label the fins.
- Describe the motion of each fin. What is the direction and range of movement? Do paired fins move together, in the same way? Are some fins used more than others?
- Fins serve different purposes. They push the fish forward, help the fish stop and turn, and help it stay upright. What is the function of each fin?
- Where are the fish's fins when it is still?

Color

- What colors do you see on the fish?
- Are the back and stomach the same color? Why are they colored like this?
- What markings do you see? What are they for?
- Look at a fish swimming near the top of the tank and one that is near the gravel. Which is easiest to see?

Senses

- Do you think fish have good eyesight? Why?
- Can the fish hear? How do you know?
- Find the lateral line. What do you think it is for?



Behavior

- What do fish do when they are startled? Why?
- Do they move as a group? What is this called?
- Are all the fish the same size?
- Describe how fish interact with each other.
- Do individuals have established areas of the tank they stay in?
- What do fish do at feeding time? Do all the fish get the same amount of foc

Nevada Department of Wildlife

Trout in the Classroom

Eggs - Fry - Release

Daily Progress Record

Project Year ________ School ______________________

Hatchery _________________________ # of Eggs _____

Date Received	H_2O Temp.	TUs	Motality		Comments Page ____ Use additional pages if necessary.
			Eggs	Fry	

Release Date ________ Release Site ________________

Fish, Fish, Fish

Preparing Fry and Students for Release

When most of the fry are actively swimming at or near the surface, prepare to release the fish. Begin acclimating the fry to surface light by opening the lid for longer periods of time each day. Notify your regional Angler Education coordinator of your release date and site, and give him or her a brief update on the status of the fish.

Students often worry about what is going to happen to the fry and their ability to survive when released. Take this opportunity to discuss survival chances and threats to fry in the natural environment (see "Where Wild Fish Come From" page 22 and "Only the Strong (and Lucky) Survive" page 23). Help students understand the percentage of fry that survival depends on many factors: predation (from birds, fish and other animals), pollution, unfavorable water temperatures and conditions, food availability, cover (or lack of cover), living space, drought or flood, physical obstacles and competition with other wild or hatchery fish. You may point out that population surveys have turned up hatchery in the age class of TIC fish in rivers where they have been released. So, some fry will make it. In fact, releasing TIC fish as fry may actually give them a better percentage chance of survival in wild habitat, over hatchery trout released as "catchable" fish.

Help students understand that they will be releasing their fry in a natural environment, but it is not part of a stocking or restoration project. Reiterate that the fish are "loaned" to them as part of an educational program. By the time the fish are released, the goals of the TIC program have been accomplished. **Students should have an understanding of egg-fry development and the habitat needs of fish at all the various stages of growth**. Also, students should realize their project is possible because of approval from the Nevada Department of Wildlife. The species of trout eggs are delivered and release site chosen by NDOW to be consistent with their responsibility for managing fish in the waters of Nevada. It is against the law, and potentially damaging for anyone, without permission from NDOW, to move any fish from one water to another, or release any kind of fish into the wild. Release sites are chosen to provide the best chance of fry survival and protect the fish that are already in the stream, river or pond.

Be sure to visit or have your tank-buddy visit the release site a day or two before the release to make sure that conditions are conducive to a smooth release (good water conditions, no extreme weather, safe and easy access to the release site). Have another approved release site in mind, in case your first choice simply won't work.

Farewell Finny Friends

Students prepare for releasing their fish into the wild by writing a good-bye letter or poem, signing the authorization form , and pledging to be responsible stewards of our fisheries resources.

As you prepare to release your fish into the wild, students may be concerned about how they will survive. This is a good time to discuss potential problems fish might encounter in their new home, and the sources of those problems. Children should not be too pessimistic about the fate of their fish, but they should understand that there are threats.

One of those threats is the introduction of aquatic plant or animal species into environments where they are not native. Planting of hatchery fish must be done so as to cause minimum impacts to wild populations. Be sure to discuss this with the students. They should understand that this project is being done with special permission from the Department of Fish and Game, the governmental caretakers of our natural resources.

Students will release their fry into the wild, but this is not a stocking program. The objective is not to increase fish populations in your watershed with hatchery fish, but rather to understand the fishes' habitat needs and how we all can help them to survive. Because of genetic concerns and the risk of spreading diseases, Fish and Game laws and policies restrict fish planting activities. This is why you may have to release your little fry into a river that is not near your school.

Show students the authorization form and discuss the conditions it lists. Talk about why moving species of plants and animals can be devastating to an ecosystem. An example is the Eel River, where temperatures have increased over the last few decades because of land uses and droughts. In addition, someone released Sacramento Squawfish into the upper basin. They survive well in warm water, and the river now has a large population. These fish, which do not belong in the Eel River, are predators of salmon and trout. This introduced predator, along with degraded habitat, have hurt salmonid populations.

Students may sign the back of the authorization form. Whether you choose to do this or not, make sure students know there are rules governing fish planting. Encourage them to write pledges to be a good stewards of aquatic resources.

Look at the pictures of different types of salmonid habitats, and talk about where your fish will live. Will they ever migrate out to sea? What will they need in their new home? What would the ideal home look like? Students may draw pictures of this place, and write a poem or letter to the fish to express their feelings. They may want to give the fish advice on how to survive.

Pre-trip Preparation

You should visit the release site before your fieldtrip. Check for bus access, safe footing and trails that will minimize impact to the stream area and reduce the risk of accidents. Take the temperature of the stream. Look for a release site in a side channel or backwater area, where the flow is gentle. Look around for some kind of cover, such as roots, logs, and rocks. Check out possibilities for other activities, such as aquatic insect identification, a riparian survey, flow measurements, etc. See if a volunteer from a local fly fishing club can help with the fieldtrip.

The Release

When you first arrive at the release site, place the bucket in the stream. If there is a large difference between stream and bucket water temperatures, you can wait for the bucket water to equalize, or you can slowly and gradually add stream water to the bucket. Do not shock the fish - avoid temperature changes greater than 5° F.

While you are waiting, have students check for all the conditions fish need. Take the temperature of the water. Note how much shade is provided by riparian vegetation or canyon walls. Use a net or pick up rocks to find aquatic insects. Look around for the places where fish will hide. You could even measure the stream's pH and dissolved oxygen content.

To let the fish go, each student may scoop out one or two fry and let them go individually. Or, have several students slowly tip over the bucket and let the fish swim away.

Glossary

alevin	A newly hatched salmonid with a yolk sac attached to its stomach. Lives buried in the gravel stream bed.
bubble curtain	Where you cannot see through the water because there are lots of bubbles.
cascade	Falling water.
chinook	A type of salmon. One of five species of salmon.
cobbles	Stream rocks that are 2 - 10 inches across (from the size of a person's fist to the size of a person's head).
confluence	The place where two streams come together.
estuary	The area where the river meets the ocean and fresh water mixes with salt water.
eyed eggs	Salmon eggs that have developed eyes. The eyes are big dark spots.
fry	A young fish. A young salmonid that lives in fresh water.
gill covers	The skin that covers a fish's gills.
gills	Organs on both sides of a fish's head that take oxygen from the water so fish can breathe.
gravel	Rocks that are between 1/10 inch and 2 inches across.
hatchery	A place where fish are spawned and eggs are hatched. The fry are raised and then put into lakes, rivers, reservoirs, lagoons and streams.
homing	When salmon return to their home stream after spending years in the ocean. Homing is an instinct.
imprinting	When the smells of a river and watershed are "stamped" into a salmon's brain, making a scent memory.
lateral lines	A special line of cells on each side of a fish's body. Used to sense motion and magnetic fields.
migration	To move from one place to another, usually in a group. Salmon & steelhead migrate out to sea and then back to the river of their birth.

mucous	A slippery liquid usually in places of a body where the inside meets the outside, like in the mouth.
ocean	Very large bodies of salty water that make up most of Earth's surface. Also called the sea.
parr marks	Marks on the sides of a salmonid fry that are almost round. Help fish hide from predators by making it look like its surroundings.
plunge pools	Pools that are made when water falls over a rock or log and scours out a hole.
pool	A place in the stream where the water flows very slowly and the surface is smooth. Pools are usually deeper than other areas.
predator	An animal that kills other animals for food.
redd	A salmonid nest. Made in gravel in the stream bed.
riffle	A place in a stream where the water flows quickly. The surface of the water is choppy.
run	A group of salmon that come back to a river together to spawn.
salmonid (sal-'mon-id)	Any fish belonging to the family Salmonidae. This includes salmon, trout and char. All are cold water fish.
scales	Small, plate-like things that overlap and cover a fish's body. Made of material like fingernails.
school	A group of fish that swim together for protection.
scour	To dig a hole or depression.
sediment	Very small pieces of rock that wash into streams. Too much sediment is not good for fish.
silt	Very fine particles of rock, like sand.
smolt	A salmon that has lost its parr marks and is ready to go out to sea.
spawn	Making new life. A female fish lays eggs and a male fish fertilizes them.
yolk sac	A "bag" of food that is connected to the stomach of very young salmon and trout.