

# Trout Journey Game



Grade	4th
Time	35-45 minutes
Overview	This game explores the life stages of trout, emphasizing the obstacles and threats that trout face throughout their lives, the survival rate of trout in each life stage, and the reproductive strategies of trout.
Objectives	<p><u>Understanding:</u> Students develop an understanding of a trout's life cycle, and the potential hazards trout can face at each stage. Students compare the success of a trout in the wild versus in the classroom.</p> <p><u>Skills &amp; Processes:</u> Students develop fraction skills and use critical thinking to assess hazards (including human impacts) on trout habitat and life cycle.</p> <p><u>Values:</u> Through this field activity, students develop stewardship habits related to trout and trout habitats and habitat conservation/restoration. Habitat conservation and Leave No Trace (LNT) practices are important for supporting trout populations.</p>
Essential Question	What happens to all the eggs that one trout lays? How does the life cycle of a trout in the wild compare to a trout raised in the classroom?
Primary VA SOL	Science (2018): 4.3 and 4.8
Related SOL	Math (2016): 4.2



## Materials

- 10 lbs. lentils distributed as follows:
  - Small cups (4-6 ounces), to hold each participant's lentils, one per participant - prefilled
  - remainder of lentils in a large container with a scoop
- one die per participant
- one spoon per participant
- One lentil receptacles at each of the 14 stages (we used aluminum roasting trays)
- Stage labels (provided)

## Special Safety

Explore the outdoor area for any holes, rocks, or branches that may cause a student to trip. Look for any other safety hazards such as a nearby hornet or yellow jacket nests, or poison ivy.

**Set Up**

1. Place stage labels in a numeric loop.
2. For each student: fill a container with lentils and place a die and spoon with each container.
3. Periodically collect lentils from the stages to refill for the next class.

<b>Instructional Strategy</b>	
Recommended Grouping/Instructional style	<ul style="list-style-type: none"> <li>• Pairs, kinesthetic</li> <li>• Split class into two larger groups, Half will start at "Wild," and half will begin at "Classroom" journey.</li> <li>• We recommend smaller groups that stagger their entry into each journey to avoid bottlenecks.</li> <li>• You may find that it is helpful to have an extra adult helping with fractions, explaining unfamiliar words, and otherwise engaging the students.</li> </ul>
Steps	<ol style="list-style-type: none"> <li>1. <b>Explain</b> to students that they will be playing a game to compare the life cycle survival rates (or challenges and successes) of trout raised in the classroom to trout raised in the wild. Ask them to guess which trout may have a better survival rate.             <ol style="list-style-type: none"> <li>a) Show a stage sign and explain that trout go through several life stages. Some trout make it through all the life stages, but at each life stage, there are threats and obstacles that can prevent some trout from surviving. Each stage describes that life stage and presents some obstacles that at least some of their trout will have to avoid.</li> <li>b) Students must go through the stages in order.</li> </ol> </li> <li>2. <b>Engage:</b> Each student receives a prepared small (4 oz.) container of lentils, a spoon and a die. Tell them that this is their trout "nest" or redd. Each lentil represents one trout egg that could eventually grow into an adult trout (A single female trout can lay between 100-600 eggs each fall, depending on her size and health).             <ol style="list-style-type: none"> <li>a) At each stage students roll the die and then read the corresponding trout journey event that matches the number they rolled and follow those instructions.</li> <li>a) When finished, ask them to count or estimate how many "trout" they have left. Inquire: What happened? How many trout do you have left? How many trout are needed to build a new nest and lay a whole new batch of eggs?</li> </ol> </li> <li>3. <b>Repeat</b> with the other scenario.</li> </ol>

	<p><b>4. Discussion:</b></p> <ul style="list-style-type: none"> <li>a) What happened to your trout as you moved through the stages? Where did you lose the most trout?</li> <li>b) What kinds of predators did your trout encounter? Was there anything that humans did that caused harm to the trout?</li> <li>c) How did the survival of the trout raised in the classroom compared to the trout raised in the wild?</li> <li>d) Which trout faced fewer life obstacles and which trout had a better chance at surviving to lay more eggs?</li> </ul> <p><b>5. Conclusion:</b> Use the data they collected and the discussion to fill out the Venn diagram and compare the trout journeys.</p>
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Extensions

- Weigh the quantity of lentils at each stage to estimate the fraction to be removed more accurately.
- Record the event(s) at each stage – include both what happened and what fraction was removed (and if weighed, the weight removed – then at the end, reverse calculate to get the approximate number of eggs started with.

Acknowledgments

This lesson is adapted from the [Trout Unlimited Salmon Survival Game lesson plan](#)

The following acknowledgements are from them

Original Salmon Survival Game Activity by Rochelle Gandour-Rood, TU’s Headwaters Youth Program Coordinator.

- Many thanks to TU Chapter 383, North Kitsap Bainbridge Island, for requesting this activity in the first place, and for piloting it at a spring fly fishing expo on Bainbridge Island.
- Gratitude to TU Chapter 146, Tacoma, for continuing to work with the activity, and to Friends of the Issaquah Trout Hatchery and Pierce County Conservation District for their interest in the game.
- Thanks, also, to Long Live the Kings for their illustrations, scientific consultation, and other assistance in creating this final version of the game.

## Trout Journey Game Datasheet

### Wild Trout Journey

Stage	What Happened?
Stage 1	
Stage 2	
Stage 3	
Stage 4	
Stage 5	
Stage 6	
Stage 7	

### Classroom Trout Journey

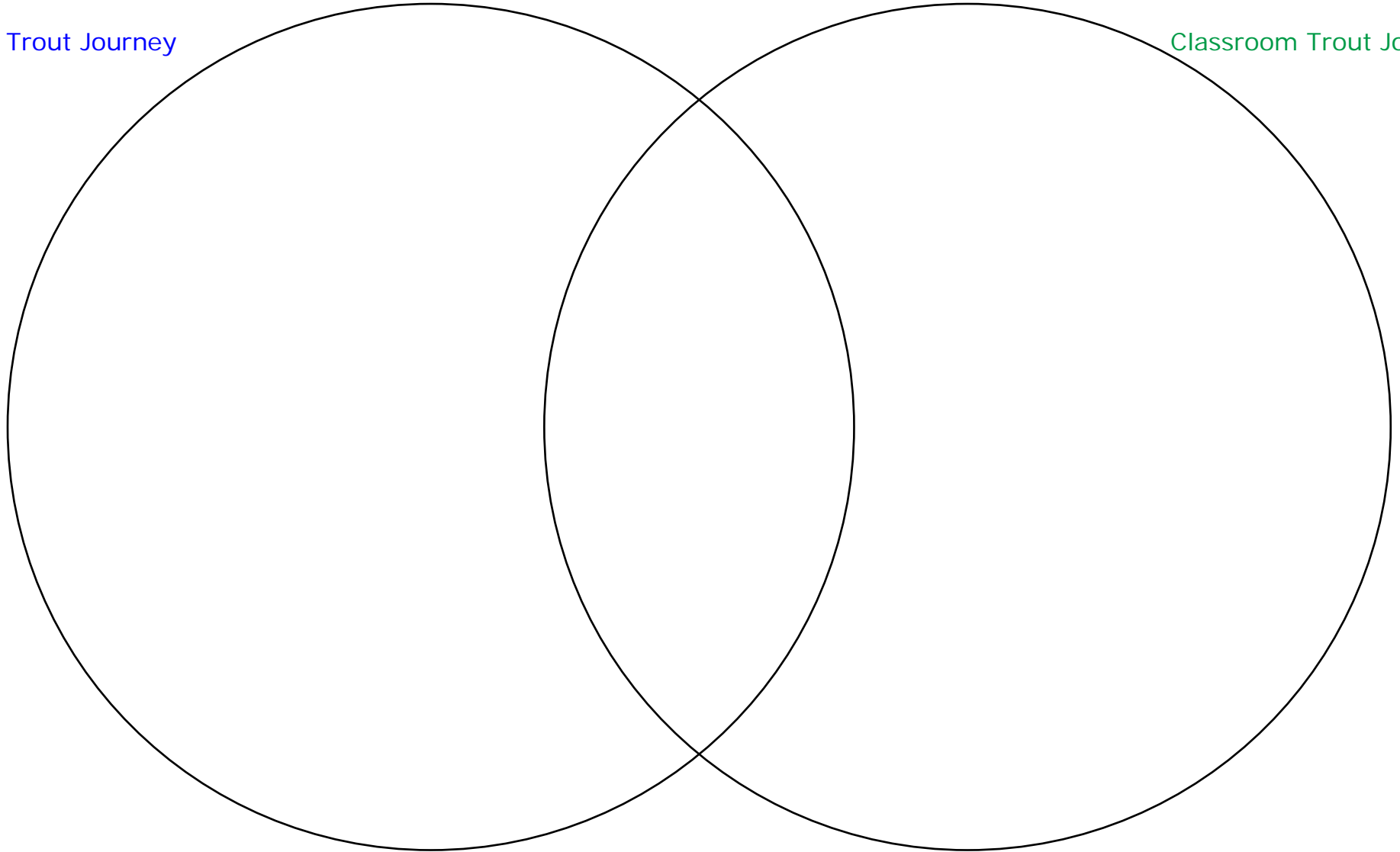
Stage	What Happened?
Stage 1	
Stage 2	
Stage 3	
Stage 4	
Stage 5	
Stage 6	
Stage 7	

# Trout Journey Comparison

How did your imaginary trout do in their journeys? What was the same? What was different?

Wild Trout Journey

Classroom Trout Journey



The following pages are the steps in the trout life journey. These were designed to be used both in person and as a slide deck online for remote learning.



**Classroom Trout**



**Wild Trout**

# Trout Survival Game

1. This game helps to understand what threats can happen to trout at each of their life stages, both in the classroom AND in the wild.
2. You have a container of lentils (a type of bean). These are your trout eggs in their “nest” (called a redd). Each lentil represents one trout egg that could eventually grow into an adult trout.
3. Read each slide. Then roll your die and read the event that matches the number you rolled, and follow the directions to pour out the amount of lentils listed.
  - a. When pouring out  $\frac{1}{2}$ , estimate and pour out half of what is still in your container. Not half of a full nest.
4. Place a circle around the number that you rolled to keep track of what happened to your eggs.
5. Good luck!

# Wild Trout Stage 1:



You are a trout egg, freshly laid in a redd (nest) of gravel (small rocks).

Everything goes well!  
Move to Stage 2.



Eggs are stepped on  
by a person playing in the  
stream. Remove 1/2.



Many eggs are eaten by a  
big fish. Remove 1/2.



Some eggs are covered  
with soil from a building  
site.



Remove 3 spoonfuls.

Some eggs are eaten by  
a big fish.



Remove 1 spoonful.

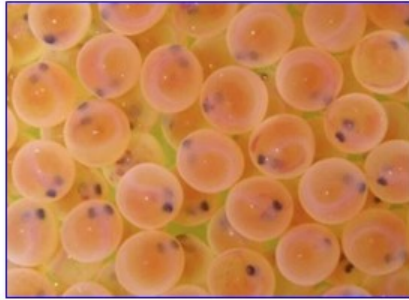
Some eggs are covered by  
soil from a clear-cut forest.



Remove 1/2.




# Wild Trout Stage 2:




You have developed (grown) into an eyed egg. Your eye can be seen through your egg shell.


Some are stepped on by a fisherman.  
Remove 1/2.



Some are eaten by a big fish. Remove 1/2.



Some are washed away during heavy rains. Remove 1/2.



Most survive! Move to Stage 3.



Some are smothered by soil from the road.  
Remove 1 spoonful.



Some are washed out by a flood.  
Remove 3 spoonfuls.



# Wild Trout Stage 3:



**You've hatched into an alevin with a big yolk sac (belly full of food).**

Some are eaten by crawfish.  
Remove 3 spoonfuls.



They get too warm and can't breathe.  
Remove 1/2.



Some are caught up in a flood. Remove 1 spoonful.



Some are covered by soil from a clear-cut. Remove 1/2.



Some are eaten by big fish.  
Remove a spoonful.



Some are stepped on by someone swimming.  
Remove 1/2.



# Wild Trout Stage 4:



**Now you are a little fry with good camouflage. You eat little insects and hide a lot.**

Some are eaten by bigger fish. Remove 1/2.



Some are eaten by a bird. Remove 1 spoonful.



Some are eaten by a raccoon.

Remove 2 spoonfuls.



Some are eaten by a bird. Remove 1 spoonful.



Some are eaten by bigger fish.

Remove 4 spoonfuls.



Some can't find enough food and starve.

Remove 1/2.



# Wild Trout Stage 5:



**When you become a juvenile (young fish), you start hunting aquatic insects and tiny fish.**

Some are eaten by brown river snakes.



Remove 1 spoonful.

Some die from fertilizer & herbicide runoff. Remove  $\frac{1}{2}$ .



Some are eaten by an otter. Remove  $\frac{1}{2}$ .



Some are eaten by great blue herons. Remove 3 spoonfuls.



Some are eaten by bigger fish. Remove  $\frac{1}{2}$ .



Everything goes well! Move to stage 6.



# Wild Trout Stage 6:



**As an adult, you claim territory with good hiding spaces, a gravelly bottom, and plenty of food.**

Some are eaten by bears.  
Remove a spoonful.



Some are caught by  
people fishing.  
Remove 1/2.



Some are eaten by eagles.  
Remove 1/2.



Some can't find enough food  
and starve.  
Remove 1/2.



Trees are cut down and  
the water gets too hot.  
Remove 1/2.



Everything goes well! Move  
to Stage 7.



# Wild Trout Stage 7:



**Females search for the perfect gravel on which to lay their eggs. Males fight for the right to fertilize the eggs.**

Some are eaten by eagles.  
Remove  $\frac{1}{2}$ .



Some are eaten by a snapping turtle. Remove  $\frac{1}{2}$ .



Some are caught by bear.  
Remove  $\frac{1}{2}$ .



Some cannot find a mate.  
Remove  $\frac{1}{2}$ .



Some cannot find good gravel for eggs. Remove  $\frac{1}{2}$ .



Some are caught by people fishing. Remove  $\frac{1}{2}$ .



# **Congratulations remaining trout!**

The number of trout (lentils) still in your cup represents the number of trout that would have made it living in the wild.

In the wild, about 95% of trout die before reaching their first birthday. That means if you have 100 trout eggs to start, only 5 survive to adult fish!!

# Classroom Trout Stage 1:




**You are a trout egg, freshly laid in a redd (nest) of gravel (small rocks).**


The tank gets too warm.  
Remove ½.




Everything is great! Move on to Stage 2.




Everything is great! Move on to Stage 2.




Everything is great! Move on to Stage 2.



Everything is great! Move on to Stage 2.

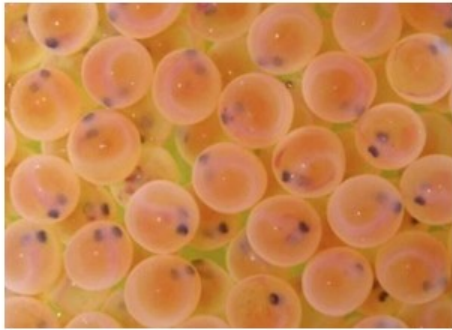


The eggs were cracked when moved into fish tank.  
Remove ½.





# Classroom Trout Stage 2:



You have developed (grown) into an eyed egg. Your eye can be seen through your egg shell.


Everything goes well!  
Move to Stage 3.



Everything goes well!  
Move to Stage 3.




Everything goes well!  
Move to Stage 3.




Everything goes well!  
Move to Stage 3.



The fish tank water became too warm.  
Remove 1/2.



The fish tank water became too warm.  
Remove 1/2.



# Classroom Trout Stage 3:



**You've hatched into an alevin with a big yolk sac (belly full of food).**

Everything goes well!

Move to Stage 4.



The fish tank water became too warm.

Remove 1/2.



Some alevin don't survive. This is normal. Remove a spoonful.



Some alevin don't survive. This is normal. Remove a spoonful.



Everything goes well!

Move to Stage 4.



The fish tank water became too warm.







Remove 1/2.



# Classroom Trout Stage 4:



**Now you are a little fry with good camouflage. You are ready to eat little insects and hide a lot.**

 <p>Everything goes well! Move to Stage 5.</p>	 <p>Chemical levels in the fish tank aren't what they should be. Remove ½.</p>	 <p>The fish tank becomes too warm. Remove ½.</p>
 <p>Some fry didn't get enough food. Remove a spoonful.</p>	 <p>Some fry do not survive. This is normal. Remove a spoonful.</p>	 <p>Some fry get pulled into the filter. Remove a spoonful.</p>

# Classroom Trout Stage 5:



**When you become a juvenile (young fish), you are released into the WILD! You start hunting aquatic insects and tiny fish.**

Fish are eaten by brown river snakes.

Remove ½.



Fish die from fertilizer & herbicide runoff. Remove ½.



Fish are eaten by bigger fish. Remove ½.



Fish are eaten by birds. Remove a spoonful.



Fish are eaten by bigger fish. Remove a spoonful.



Fish are eaten by turtles. Remove ½.



# Classroom Trout Stage 6:



**As an adult, you claim territory with good hiding spaces, a gravelly bottom, and plenty of food.**

Some are eaten by bears.  
Remove a spoonful.



Some are caught by  
people fishing.  
Remove 1/2.



Some are eaten by birds.  
Remove 1/2.



Some can't find enough food  
and starve.  
Remove 1/2.



Trees are cut down and  
the water gets too hot.  
Remove 1/2.



Everything goes well! Move  
to Stage 7.



# Classroom Trout Stage 7:



**Females search for the perfect gravel on which to lay their eggs. Males fight for the right to fertilize the eggs.**

Some are eaten by eagles.  
Remove  $\frac{1}{2}$ .



Some are eaten by a snapping turtle. Remove a spoonful.



Some are caught by bear.  
Remove a spoonful.



Some cannot find a mate.  
Remove  $\frac{1}{2}$ .



Some cannot find good gravel for eggs. Remove  $\frac{1}{2}$ .



Some are caught by people fishing. Remove  $\frac{1}{2}$ .



# **Congratulations remaining trout!**

The number of trout (lentils) still in your cup represents the number of trout that would have made it living in the wild.

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