



Mutant Chinook Salmon

Manhattan Project, Hanford, Washington

July 16, 1945

Dr. Laura Donaldson: Hello Dr. _____.

Your Name

I am so glad you are here. We need your help! Dr. Foster and I study and protect the Columbia River's Chinook salmon. General Leslie Groves hired Dr. Frank N. Fish to help us with our work but Dr. Frank N. Fish has gone mad! He created mutant salmon and released them into the Columbia River. If we do not act soon, the mutant salmon will swim upriver and make more mutant fish! General Groves sent you here to help us identify the mutant salmon and fish them out of the Columbia River. Dr. Foster will fill you in on the rest.

Dr. Richard L. Foster: In 1942, the US government created the Manhattan Project. General Groves is the person in charge of the Manhattan Project and our boss. The Manhattan Project is a top-secret program to build the world's first atomic bombs. There are three reactors at Hanford producing plutonium for the Manhattan Project, including the world's first full-scale nuclear reactor, the B Reactor. Hanford's reactors are next to the Columbia River, and we use the river water to cool the reactors down when they get too hot. Plutonium is radioactive, and scientists do not know if the plutonium and the other materials we use at the reactors impact the Chinook salmon living in the Columbia River. General Groves put Dr. Donaldson and I in charge of finding out. Now it is our job to stop Dr. Frank N. Fish and his mutant salmon! General Groves left your orders below. Follow General Groves' orders and good luck!

General Leslie Groves' Orders:

1. Read the Chinook Salmon Vocabulary section below.
2. Read the Chinook Salmon Identification Guide on page 2.
3. Complete the Mutant Chinook Salmon Activity on page 3.
4. Complete the Aquatic Field Notes Activity on page 4.

Chinook Salmon Vocabulary

Anadromous- fish that are born in freshwater (streams and rivers) and spend most of their lives in saltwater (oceans). The fish return to the freshwater to spawn. Pronounced: un-NAD-ruh-muhs.

Habitat- the environment or natural home where an animal or plant lives and grows.

Ichthyologist- a scientist who studies salmon and other fish that are bony or jawless. They study fish history, behavior, spawning, environment, and growth patterns. Pro-nounced: IK-thee-OL-uh-jist.

Redds- gravel nests or hollows in stream bottoms and riverbeds. Salmon lay their eggs in redds.

Spawn- to make or deposit a large number of eggs.

Species- a class of plants or animals who have the same main characteristics. Salmon, dogs, and humans are different type of species.



Chinook Salmon

Other names: King Salmon, Tyee Salmon, Spring Salmon

Appearance:

- In fresh water- they change color to olive brown, red, or purplish.
- In the ocean- they are blue-green on the back and top of the head.
- Black spots on the upper half of their body and on both lobes of the tail fin.
- Black or dark-colored gums.
- Typical length and weight of adult fish are about 3 feet and 30 pounds. They can grow as big as 4.9 feet and 129 pounds. Chinook salmon are the largest of the Pacific salmon.

Facts:

- Chinook salmon are anadromous. They hatch in freshwater streams and rivers then swim out to the saltwater ocean to feed and grow.
- Their habitat is freshwater and saltwater. They use branches and logs for hiding in freshwater habitats.
- They spend a few years feeding in the ocean. Then return to streams or rivers to spawn in the summer and early fall.
- Chinook salmon dig out redds (gravel nests) in stream and river bottoms. The Chinook salmon lay their eggs in the redds.
- Young Chinook salmon eat insects and other crustaceans like crabs and shrimp. Older Chinook salmon eat mostly fish.

Mutant Chinook Salmon Activity Supplies

- | | |
|---------------------------------|--|
| - (3) pipe cleaners | - (1) pencil, wooden dowel, or stick |
| - (3) sheets of cardstock paper | - (1) 16 inch piece of twine, fishing line or thick string |
| - (1) pair of scissors | - Crayons, markers, paint, or color pencils |
| - (1) medium or large paperclip | - Any other materials you would like to use to decorate your fish. |

Mutant Chinook Salmon Activity Directions

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1. Gather supplies and print the Mutant Chinook Salmon Template (3 pages).
2. Use your Chinook Salmon Identification Guide to color the 3 healthy Chinook salmon.
3. Dr. Frank N. Fish left 1 mutant salmon blank. Decorate the mutant salmon using any materials you like.
4. Color the 5 remaining mutant Chinook salmon or leave them blank.
5. Cut out all 9 fish.



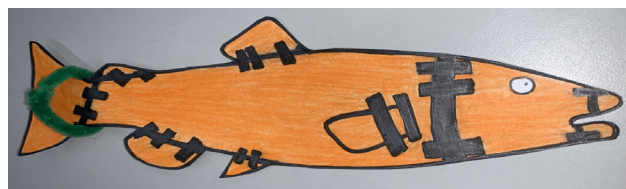
6. Take a pipe cleaner and cut it in to thirds. Do this for all three pipe cleaners.



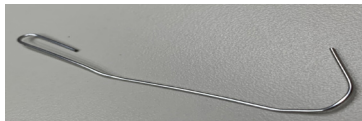
7. Take a fish and turn it so the blank side is facing you. Take a piece of pipe cleaner and place it underneath the fishtail.
8. Bend the pipe cleaner into a U shape.



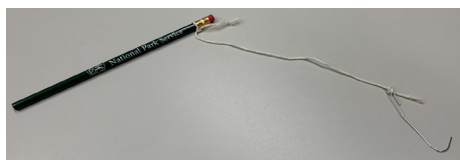
9. Twist the pipe cleaner ends together to form a circle around the tail. Do not make the loop too tight or you will not be able to hook your fish hook through the loop.



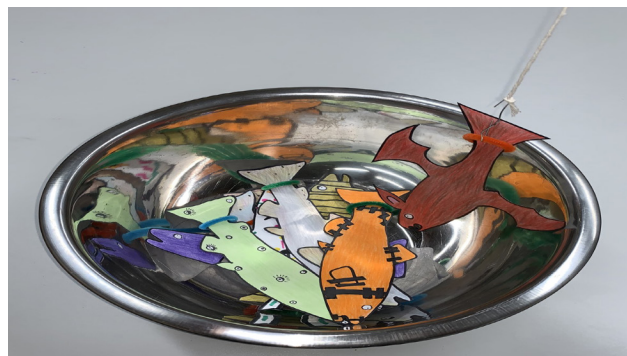
10. Repeats steps 7-9 until each fish has a loop.
11. Bend your paperclip in to a shape of a fish hook.



12. Take your twine and tie a knot around the top of your fish hook.
13. Take the other end of your twine and tie it to the end of your pencil.



14. Put all 9 fish into a large mixing bowl, dry sink or bathtub.
15. Use your fishing pole to fish the six mutant salmon out of the Columbia River (bowl, sink, or bathtub).



Aquatic Field Notes Activity

Directions: Record your findings (the things you observed about the Chinook salmon) for Manhattan Project scientists and General Groves. Follow the steps below to complete your Aquatic Field Notes.

1. Write your name on the line that says Ichthyologist.
2. Write how many healthy Chinook salmon you saw.
3. Write how many mutant Chinook salmon you saw.
4. Choose two mutant Chinook salmon to observe and record.
5. Fill out the Aquatic Field Notes below.

Name: Give the mutant Chinook salmon a name.

Species: Dr. Frank N. Fish mixed different animals and objects with the Chinook salmon to create his mutant salmon. It is your job as a scientist to record what animal or object you think Dr. Frank N. Fish mutated with the Chinook salmon.

Features: Describe what the mutant Chinook salmon looks like.

Habitat: Describe the mutant Chinook salmon's habitat.

Observations: Add anything else you think Manhattan Project scientists and General Groves should know about the mutant Chinook salmon. Hints: What does it eat? How does it behave?

Aquatic Field Notes

Ichthyologist: _____

Date: July 16th, 1945

Location: Manhattan Project, Hanford Unit, Columbia River.

Healthy Chinook Salmon Species Total:

Mutant Chinook Salmon Species Total:

Name:

Observations:

Species:

Features:

Habitat:

Name:

Observations:

Species:

Features:

Habitat:

