Be a Fisheries Biologist: Hypothesis Worksheet



Name: _____ **Date:** _____



Fisheries Biologist Note: A hypothesis is an educated guess or testable prediction about how something in nature works. Write your hypotheses below using 'If... then... because...' to explain your scientific predictions!

Question 1 Nest Size & Number of Species



Research Question: Is there a relationship between the size of the nest and the number of other species that use the nest?

- **My Hypothesis:** If a Bluehead Chub builds a larger nest, then the number of other fish species using the nest will **[INCREASE / DECREASE / STAY THE SAME]** (circle one).
- **Because:** _____

_____

Question 2 Nest Size & Total Eggs Laid



Research Question: Is there a relationship between the size of the nest and the total number of eggs laid on the nest?

- **My Hypothesis:** If a Bluehead Chub builds a larger nest, then the total number of eggs laid on the nest will **[INCREASE / DECREASE / STAY THE SAME]** (circle one).
- **Because:** _____

_____

Question 3 Why Do Bluehead Chubs Do This? (Ecological Advantage)



Research Question: Why would the Bluehead Chub spend so much energy carrying tens of thousands of pebbles to build nests for other fish species? What is the ecological advantage?

- **My Hypothesis:** I think that the Bluehead Chub shares its nest with other fish species because...

_____

_____

_____

Be a Fisheries Biologist: Nest Data Collection

Name: _____ Date: _____

PART 1 Nest Measurements

Measure your nest carefully with a ruler before taking it apart!

Nest Measurement Variable	My Measurement / Count	How to Measure
Nest Height	_____ inches	Measure straight up from desk to top of mound.
Nest Width	_____ inches	Measure across the widest part of the mound.
Total Pebble Count	_____ pompoms	Count total pompoms used to build nest.

PART 2 What Did Your Nest Support?

Use your Total Pebble Count from Part 1 to look up your nest's ecological results in the scientific reference chart below:

Number of Pebbles per Nest	Number of Fish on Nest	Number of Eggs Laid on Nest	Number of Species Supported
1 – 10 pebbles	5 fish	2,000 eggs	4 species
11 – 20 pebbles	23 fish	9,200 eggs	10 species
21 – 30 pebbles	46 fish	18,400 eggs	25 species
30+ pebbles	60 fish	24,000 eggs	40 species

My Nest Results: Based on my pebble count, my nest supported _____ species of fish and _____ total eggs laid!

PART 3 Stormwater Challenge!

A flash flood from town stormwater runoff washes away 7 pebbles from your nest.

- **New Pebble Total:** _____ pebbles – 7 = _____ pebbles.
- Looking at the reference chart above, how many species can your nest support now? _____ species.
- How many total eggs laid? _____ eggs.

Pattern Check: As nest size decreases (less pebbles), the number of fish species supported [INCREASES / DECREASES] and the total number of eggs laid [INCREASES / DECREASES].

Scientist Spotlight

Dr. Emmanuel Frimpong



Dr. Emmanuel Frimpong has been studying Bluehead Chubs for 14 years. As he began to understand the critical role they play in North American stream ecosystems, he also began to rethink how to approach conservation within these environments.

"Because bluehead chubs are relatively common, we don't think of them as a species that needs protection. Yet the protection of other species that are rare and dependent on the chub will depend on understanding the role of the chub in the lives of these rare species and, ultimately, conservation of the chub."

Seeking to understand more about the role and behaviors of the chubs led Frimpong to ask more complicated questions about what these minnows were doing and why, questions involving factors like water flow and oxygen levels within their nests. Because he realized that "what these chubs do is literally engineering," the next step for his research became apparent: "Chubs are ecosystem engineers, so to study their nests, you need engineering tools." Luckily, one of Dr. Frimpong's colleagues is an expert in environmental and geophysical fluid dynamics. They are combining biology and engineering to answer these complicated questions.

