Name: Date:

Population Estimates: Bringing Math and Science Together - Student Handout

Driving Question:

How can we count every individual in a large population or in a population that moves around?

Word Bank	
Population	All the organisms that constitute a specific group or occur in a specified habitat
Population density	A measurement of population per unit area or volume
Error	Difference between a computed or measured values and a true or theoretically correct value
Assumption	Accepted existence of a fact or set of facts based on other facts or knowledge

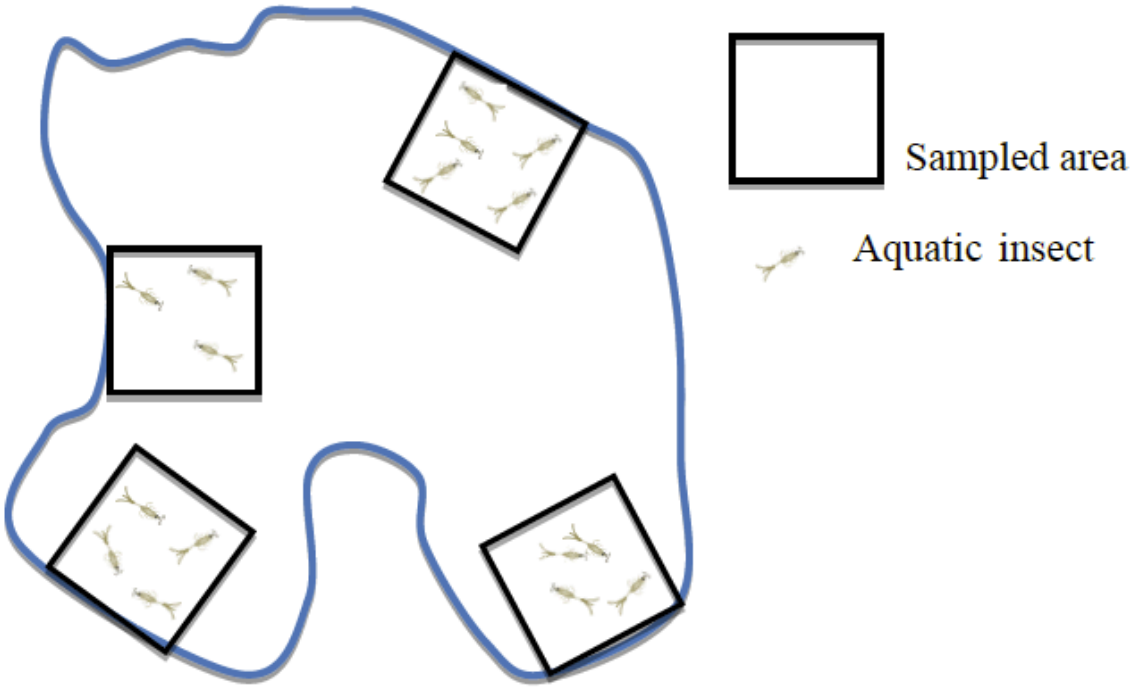
Part 1 (Engage) What is population and why is it important?

1. What is a population? Give an example.

2. Why is knowing population size important?

Part 2 (Explore) Average Population Density

3. Come up with a population estimate of aquatic insects for the lake below based on the knowledge that only ¼ of the lake was sampled. So each sampled area represents 1/16 of the total area.



- Write one example of a system that you think this technique would work well in.

- Write one example of a system that you think this technique would not work well in.

Part 3 (Explore) The Mark-Recapture Method

Sample Time 1:

- Remove two spoonfuls of beans from the container.
- Using a permanent marker, mark each bean with a noticeable mark.
- Count and record the number of beans in each spoonful in the table below.
- Place all the beans back in the bowl.

	Spoonful 1	Spoonful 2	Total
Number of beans captured			

Sample Time 2:

- Mix the beans in the bowl so the marked beans are evenly distributed throughout the container.
- Remove two spoonfuls of beans from the bowl.
- Count and record the number of beans in each spoonful (marked and unmarked).
- Count and record the number of beans that have a mark in each spoonful.
- Return all of the beans to the bowl.

	Spoonful 1	Spoonful 2	Total
Number of beans captured (marked and unmarked)			
Number of marked beans			

Calculate:

Population estimate = $\frac{\text{Total beans captured in Time 1 } \mathbf{x} \text{ Total beans captured in Time 2}}{\text{Total marked beans from Time 2}}$