

# HISI - LESSON OUTLINE

3Module Title \_\_\_\_\_ LS Team \_\_\_KTJUSD\_\_\_ Grade level: \_\_11\_\_

Lesson #	Title: Scoop This!	Number of Minutes: 50
<p>Mathematical purpose: Calculate the area of the net, the volume of the water, and the volume of the scoop</p>	<p>Scientific Purpose: To model collection techniques used in marine science.</p>	<p>Academic vocabulary: Length, width, height, area, volume, total population, fetch, distance, plankton tow, centimeters, cubic centimeters, brine shrimp, arthropod specific vocabulary</p>
<p>Common Core Standards (copy and paste): Mathematics: MP.2: Reason Abstractly and Quantitatively. MP.4: Model with mathematics HSN.Q.A.1: Use units as a way to understand problems and to guide the solution to multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ELA/Literacy: RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts , attending to important distinctions the author makes and to any gaps or inconsistencies in the account. WHST.9-12.2: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.</p>	<p>Next Generation Science Standards (copy and paste): HS-LS2-1. Use Mathematical Representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.  HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.</p>	<p>When students are finished they will understand: How to calculate area and volume. Methods for sampling populations. Characteristics of arthropods.</p>
	<p>What are teacher questions or prompts? What other arthropod were we shown? What characteristics did that arthropod have?</p>	

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<p>What are questions you anticipate students will have?</p> <p>How do you calculate area, and volume? How does the volume of the net tow compare to the volume of the tank?</p>	<p>What are misconceptions students might have?</p> <p>Only guesses can be made to determine population. Zooplankton are not related to beatles.</p>
<p>General outline of the lesson:</p> <p><b>Introduction:</b> Students will take their seats and copy down the lab title, and an introduction to the subject organism, brine shrimp, <i>Artemia sp.</i> * Experimental goal will be explained. Teacher will read and review introduction with the students. Student hypothesis generation.</p> <p><b>Procedure:</b> Teacher will describe the procedure, and guide students along the calculations and the steps.</p> <ol style="list-style-type: none"> <li>1. Calculate the area of the mouth of the collection net. *</li> <li>2. Calculate the volume of the body of water. *</li> <li>3. Calculate the volume of the collection net tow. *</li> <li>4. Collection technique: Count the number of organisms caught in the tow. *</li> <li>5. Estimate the total number of organisms in the tank. *</li> <li>6. Expand statically, first by finding mean of counts, and using this number to compare. *</li> </ol> <p>Conclusion: Students will explain the accuracy of their collection techniques, accept or reject their hypothesis, and explain the results obtained through individual plankton tows, and larger data sets derived from a group mean, and class mean plankton count.</p> <p>*Accommodations for student with special needs (see end of lesson outline)</p>	

Supplemental files/resources will follow

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\* **Accommodations:** Designed to accommodate for student with Specific Learning Disabilities (SLD) with processing disorders in Auditory and/or Visual processing, SLD with processing disorder in Attention or Cognitive Abilities, and Other Health Impairments (ADD, ADHD).

## Introduction

- ❖ Provide written copy of Introduction/Directions/Procedures

## Step 1

- ❖ Provide calculation template for area of net

## Step 2

- ❖ Provide calculation template for volume of tank

## Step 3

- ❖ Provide calculation template for volume of net tow

## Step 4 and 5

- ❖ Demonstrate tow technique/method
- ❖ Pair students for experiment according to strengths and needs

## Step 6

- ❖ Provide example of finding a mean (visual and auditory)
- ❖ After students find mean in pairs, find mean as a whole class