Module 3 Overview:
Module 3 focuses on the use and manipulation of multi-variable formulas. The content is centered on lionfish derbies being used as a method to estimate population samples.

Focus: Use and rearrange formulas; Make inferences and estimations based on observational data.


Provided Materials: Teacher Guide, Student Handout and Answer Key

Necessary Materials: Calculator

Module 3 Lesson Notes:
In this module, students will be given three formulas to apply to a case study of lionfish population near Cozumel, Mexico. They will be asked to interpret their findings, as well as rearrange formulas.
Module 3 Glossary:

1. **Catchability** is a concept in fishery biology which reflects the efficiency of a particular fishery. Its quantitative magnitude is expressed by the **catchability coefficient**, which relates the biomass abundance to the capture or fishing mortality.

2. **Catchability Quotient** – The comparison of the abundance of fish compared to the number of fish caught. For this investigation, the measure of effort is assumed to be the same.

3. **Estimated population** – The calculated number of fish living in an area at a specified point in time. The estimated population is calculated using a component of change model that incorporates information on population increases and decreases over a specified time.

4. **Lionfish derby** – Fishing tournaments designed with the sole purpose of capturing lionfish as a method to remove fish from the ecosystem. control the population.

5. **Population Density** – Number of fish per unit of area.

6. **Hectare** – Unit of area equal to 10,000 m$^2$ or about 2.5 acres.

Definitions and exercises adapted from the following resources:


[www.census.gov](http://www.census.gov)