INTRODUCTION TO VECTORS
/LESSON OVERVIEW

Objectives

The students will:
• learn the difference between a vector quantity and a scalar quantity;
• draw vector diagrams;
• add and subtract vectors;
• calculate resultant vectors;
• calculate vectors using real life shark data.

Lesson Summary

Part 1. Vector and Scalar Basics (30 – 45 minutes)
Define vectors, magnitude, displacement, and scalar. Explain how vectors are drawn and written.

Part 2. Vector Equality (10 minutes)
Learn why/how if two vectors have the same magnitude and direction, they are said to be equal.

Part 3. Vector Diagrams (30 – 45 minutes)
Explain how vectors can be used to navigate and explain direction. Calculation examples provided.

Part 4. Adding and Subtracting Vectors (30 – 45 minutes)
Introduce vector diagrams and how to add and subtract vectors using head to tail method and matrix method. Calculation examples using shark movement is provided. Then learn how to plot vectors on a graph.

Part 5. Adding Force Vectors (30 – 45 minutes)
Introduce force vectors. Explain how vectors can be used to describe thrust, gravity, velocity, and acceleration. Worksheets provided.

Activity 1. Shark Travel Vectors (60 minutes or take-home)
Students will create vector diagrams using data collected from the OCEARCH Global Shark Tracker™. Each student will choose three sharks, observe their migration patterns, and record three consecutive vectors from any point in time for each shark. The students will then calculate the resultant vector for each shark using the "head to tail method".
Materials: Computer with internet access, paper, pencils, rulers, colored pencils, and protractors. Worksheets provided.