

# Physics of Shark Movement Part 1 – Forces and Energy

## Lesson Overview

Grade Level: 6 – 8

Time Estimation: 3 – 5 days

### Objectives

The students will:

- learn the four main forces involved in movement – lift, weight, force, and drag;
- use fundamental physics to explore the mechanics of sharks in motion;
- learn the basics of shark anatomy and how it affects locomotion;
- learn the difference between potential and kinetic energy;
- calculate both potential and kinetic energy using respective formulas.

### Part 1. Hydrodynamic Adaptations of Sharks (20 – 30 minutes)

- Define “hydrodynamic” and identify adaptations that allow great white sharks to swim both fast and efficiently through water.

### Part 2. Forces (45 – 75 minutes)

- Learn the different types of physical forces acting on a shark in motion. Learn how these forces affect sharks while swimming and how a shark’s physical features utilize and combat these forces.

### Part 3. Potential and Kinetic Energy (90 – 120 minutes)

- Define “energy” and “work”. Learn how to solve for missing variables using formulas for potential and kinetic energy.

### Part 4. Review (15 – 20 minutes)

### Activity 1. Forces and Movement (30 – 45 minutes or take-home)

Students conduct research on two movement scenarios then compare these scenarios to how a shark swims. Explanations will include how lift and thrust is created, what causes drag and weight, and diagrams showing water/air flow. Materials: Computer with internet access, lined paper for writing, and blank paper for diagrams.

### Activity 2. Adaptation Creation (multiple days or take-home)

Students will create an invention based on their knowledge of shark adaptations and anatomy. Materials: Computer with internet access, lined paper for writing, and blank paper and assorted craft materials visual representation of invention.

### Activity 3. Energy Practice Problems (30 – 45 minutes or take-home)

Assortment of calculation problems. Worksheet and answer key provided.

---

PARTNERS

---