Topic: History of Sailboats

Primary Goal: Students will learn how sailboat designs have evolved and improved over hundreds of years. We want students to understand why certain designs have succeeded and why others have failed.

Lesson Objectives:

- Sailboats have a long history which provides important insights into why boats have evolved to what they are today
- Students should understand the pros and cons to earlier sailboat designs
- After this lesson, students should be able to reference ancient designs and effectively integrate them into their own design later in the course

Lesson Outline:

I. Intro
  a. Without an engine or motor (way to convert a form of energy into mechanical energy) sailing vessels relied upon wind for propulsion
  b. Sailboats are classified by:
    i. The shape of their sails and how many sails they have
    ii. The location and number of masts

II. Early History
  a. Dhow – one of the earliest sailboat designs
    i. Two or more triangular sails called "lateens"
    ii. Explain the significance of a dhow's unweighted shallow keel
    iii. Generally weighted down by cargo or rocks to maintain stability
    iv. Marconi

III. Age of Sail – 16th-19th century period where international trade and naval warfare were both dominated by sailing ships
  a. Square Rig – aerodynamically most efficient running rig
    i. Good for sailing downwind
    ii. Introduce "Sail area" – Square-rigs had an extremely large sail area that allowed it to take advantage of even light winds
  b. Ketch/Yawl
  c. Cutter – traditionally a single-masted, fore-and-aft rig, with at least two headsails
    i. Fore-and-aft rig – sail configuration is set along the line of the keel rather than perpendicular
  d. Sloop – single-masted, fore-and-aft rig, with a single headsail
    i. Bermuda rig most common
    ii. Allows optimal upwind sailing and downwind sailing
      1. Introduce spinnaker and compare to wing-on-wing
  e. Catboat

IV. Modern Designs

   a. Hydrofoil – sailboat with wing-like foils mounted under the hull
      i. As the boat speeds up, the hydrofoils lift the hull up and out of the water
      ii. This decreases the amount of drag, and increases the boat speed
      iii. Monohull vs. Multihull

Supplemental Resources:

Sailboat History Timeline: http://www.dawn.com/news/617729/sailboat-history-timeline

Chapman's p. 30: Diagram

Exercises/Activities:

Put a series of sailboat photos on the board and have students identify each and describe some of the characteristics.