

**Kalmar Nyckel: Using a 17th century  
Dutch Pinnacle to Teach Physics and More**

Unit Abstract and Synopsis

This physics unit is designed to help middle school students develop an understanding that an object's motion depends on the sum of the forces acting on it. Through the use of engineering, people have found ways to develop machines, simple and complex, that allow us to use natural forces, such as wind and water, for our benefit. By focusing on the Kalmar Nyckel, students develop a deeper understanding of the interrelationship between exploration and science. In addition to learning history, they use the levers, pulleys and sails on the modern recreation. This unit aligns with both the Next Generation Science Standards and Common Core Standards for Mathematics and ELA. In investigating Newton's Laws of Motion, the mechanical and directional advantages offered by simple machines, and the concept of buoyancy, they use six of the key science practices of the Next Generation Science Standards as they ask questions, develop and use models, plan and carry out investigations, analyze and interpret data, use mathematics and computational thinking, and engage in argument from evidence.