

ENERGY AND WAVES PHYSICS LAB 201

Designed for Students

Grades 6th-12th
Ages 11-18

Program Length

3 hours

Park Location

Disney California Adventure® Park

SYNOPSIS

The storytelling effects and technologies of *Disney California Adventure*® Park come alive in this study of sound, light, and magnetism.

The adventure begins as students design a Disney attraction that uses show effects to tell a story. The link between these effects is revealed: they all use energy and waves. Students learn how energy can travel in waves and demonstrate concepts like wavelength and frequency.

A select attraction provides a case study for the use of sound in a theme park setting. Hands-on activities help students explore how compression waves pass through a medium. Students study the inner ear and the influence of acoustics on sound design.

The importance of electromagnetic radiation becomes clear as students use lenses and prisms to affect light's behavior. Students discuss projection, black light, reflection, and refraction, followed by up-close study of these concepts' high-tech applications in immersive environments.

Students then act out the motion of electrons in both permanent magnets and electromagnets. A select attraction showcases the way magnetism can be harnessed to create powerful motors that make theme park thrills a reality.

Students apply their newfound mastery of energy to rework their initial attraction designs. An inspirational conversation about how this applies to students' lives culminates in a challenge for further fun and further study.

LEARNING OUTCOMES

After completing Energy and Waves Physics Lab 201, participants will be able to:

- ✓ Design a Disney attraction concept
- ✓ Define and demonstrate wavelengths, frequency, and speed
- ✓ Articulate what binaural hearing is
- ✓ Describe a compression wave and its medium
- ✓ Discuss acoustics
- ✓ Describe different applications of magnetism
- ✓ Articulate the relationship between color and wavelength
- ✓ Demonstrate how light can be affected by objects like mirrors, prisms, and lenses
- ✓ Articulate the relationship between electricity and magnetism
- ✓ Distinguish the difference between permanent magnets and electromagnets