

# ENERGY AND WAVES PHYSICS LAB

Designed for Students  
Grades 3rd-12th  
Ages 8-18

Program Length  
3 hours

Park Location  
Magic Kingdom® Park

## SYNOPSIS

The unique attractions of the *Magic Kingdom*® Park form the basis of this examination of light and sound energy and its relationship to creating one-of-a-kind Disney experiences.

The learning adventure begins with students identifying how artistic details establish the story and setting of Main St. U.S.A. The stories told by the attractions in Magic Kingdom Park are made possible by applications of science, technology, engineering, art, and math (S.T.E.A.M.). Students engage in discussion and hands-on activities that form the foundation of their exploration of sound, light and storytelling at work at the *Magic Kingdom*® Park.

Sound is a familiar part of our lives and provides information about the world around us. Guided by a Disney Y.E.S. facilitator, students investigate sound and how it is produced and how it travels. A select attraction showcases how sound can alter our sense of reality and transports us from one world to another, Disney-style!

The students' journey continues into the amazing world of light and a look at the Electromagnetic Spectrum. A trip to Liberty Square® provides an illuminating understanding of the power of light in creating some delightfully "haunting" special effects!

We put it all together at a select *Fantasyland*® attraction and discover how Walt Disney Imagineers applied the principles of light and sound to create an immersive story experience. This final destination brings into sharp focus how light and sound energy are integral to the way we experience the world around us.

## LEARNING OUTCOMES

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

- ✓ Demonstrate how a compression wave travels
- ✓ Explain how sound waves are affected by traveling through different mediums
- ✓ Define and illustrate frequency
- ✓ Solve a math problem relating the frequency, wavelength, and velocity of a sound wave
- ✓ Explain how scrim, black light, and other lighting technologies are used to create special effects
- ✓ Relate the effect of Pepper's Ghost to how light is reflected in glass
- ✓ Compare and contrast the science of light and sound waves
- ✓ Articulate how acoustical engineering applies to the design of a theatrical space