PROPERTIES OF MOTION PHYSICS LAB

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

Program Length
3 hours

Park Location
Magic Kingdom® Park

SYNOPSIS

The *Magic Kingdom*® Park comes alive in a whole new way as students experience first-hand scientific principles at work at select park attractions!

Magic Kingdom Park is always on the move! This playground for all ages provides an ideal environment for an exploration of inertia and potential and kinetic energy. An activity challenge and a select attraction showcase how these concepts and the laws of physics contribute to the thrill behind today's "scream" machines.

Science combines with storytelling when students examine the role and application of pneumatics and hydraulics in creating the life-like movements of *Audio-Animatronic*® figures—a hallmark of Disney theme parks!

Students unlock the science of creating those exhilarating storytelling moments of a Disney "mountain" through hands-on activities, a final attraction, and discussion where inertia, gravity, and centripetal force take center stage in the program experience.

The learning adventure concludes with a call to action for students to look beyond state-of-the-art technology, special effects, and other elements to consider the physics behind the magic of Disney storytelling.

Note: Specified days will provide alternate geometric principles content.

LEARNING OUTCOMES

After completing Properties of Motion Physics Lab, participants will be able to:

✔ Summarize and demonstrate Newton's First Law of Motion

✔ Model potential and kinetic energy

✔ Hypothesize and experiment to determine which element of a roller coaster will require the most potential energy

✔ Distinguish between speed, velocity, and acceleration

✔ Determine whether hydraulic or pneumatics are in use on select Audio-Animatronic figures

✔ Demonstrate and calculate centripetal force

✔ Explain how airtime, positive g's, and lateral g's are experienced on a roller coaster

✔ Use a digital level to measure an angle*

✔ Draw an angle on a graph with a protractor*

✔ Calculate the height of an attraction from a distance using indirect measurement*

NOTE: (*) denotes alternate content provided on specified days.