

PROPERTIES OF MOTION PHYSICS LAB

APPLIED SCIENCES

Designed For Students:

Grades 3rd-12th
Ages 8-18

HELLO EDUCATOR!

Disney Youth Education Series is pleased to be able to provide you with these materials to gauge your students' progress as they prepare for and complete their Disney Y.E.S. experience.

To encourage creative thinking, open-mindedness, and generate excitement, we suggest that you use the Pre-Trip Coursework to help your students prepare for Properties of Motion Physics Lab. Upon your return to school, you might find the Post-Trip Assessment useful to measure student learning.

These tools are sure to get your students moving in the right direction and help ensure a learning experience that is relevant, inspiring, and thought-provoking!

We look forward to hosting you at the Walt Disney World® Resort where iconic settings, imagination, and storytelling come together to create a unique learning environment and life-long memories. See you soon!

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1. Students to research the following people:

- Galileo, Sir Isaac Newton, and Albert Einstein
- Discuss qualities that they had in common
- Discuss challenges that they faced
- Discuss their findings
- Discuss how their findings impact the way people view the world
- Discuss current day skepticism with scientific theory

2. Students to select their favorite thrill ride and, if possible, obtain an image of it.

- Students to note the following:
 - ✓ Why they made their selection
 - ✓ Where is it located and how often they have experienced it
 - What makes it thrilling:
 - Theming
 - Special effects
 - Music
 - Speed
 - Height
 - ✓ How do they feel, emotionally and physically, when they experience it
 - ✓ Would they change anything about it and why

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3. Students to participate in a “Design a Coaster” Activity:

- Students may desire to research the internet or use specific gaming software to generate ideas
 - ✓ Theming
 - ✓ Landscaping
 - ✓ Special effects
 - ✓ Construction details
 - ✓ Ride vehicle design
 - ✓ Audio
 - ✓ Queue design
 - ✓ Restraint system
- Students to use simple paper and writing utensils to create their coaster or a construction kit. However, a presentation board with details should accompany their design.
- Discuss the physics involved in the operation of a roller coaster

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At the conclusion of the Properties of Motion Physics Lab experience, have each student do the following:

1. Define potential and kinetic energy.
2. Articulate one version of the scientific method.
3. Define and demonstrate Newton's First Law of Motion.
4. Identify and define speed, velocity, and acceleration.
5. Define centripetal force.
6. Calculate the centripetal force necessary to keep a car on the road as it goes around a curve.
7. Articulate the effects of vertical and lateral acceleration.
8. Define and illustrate a hydraulic device and a pneumatic device.