

# *Electricity and the Roller Coaster*

## Lesson Plan

**Grade Level:** 6-8

**Curriculum Focus:** Basics of Electricity and Magnetism

**Lesson Duration:** Three class periods

### ***Student Objectives***

- Share words, phrases, and images that describe the latest thrill rides.
- Explore Web sites about roller coasters.
- Write a creative piece about a roller coaster or another thrill ride.

### ***Materials***

- Video on *unitedstreaming: Electricity's Attraction*

Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

- Ultimate Thrill: Electromagnetism at Play
- Computer with Internet access

### ***Procedures***

1. As students are watching the video, ask them to jot down words, phrases, images, or sounds that reflect the experience of riding a roller coaster or thrill ride. (For example, my stomach dropped, sky-ground-sky-ground, like a rocket, intense, weightlessness, a blur, adrenaline rush, boom, flying, thrust, shoot out like a volcano, suspended, screams, zero g, loops, 360-degree view of the park, twists, double barrel.)
2. Give students a class period to explore the roller coaster features at the Web sites below. They can learn about roller coasters through history, build their own, and watch videos of rides. Encourage students to explore and address the physical-science features of the rides, such as forces and motion, thrust, weightlessness, and zero g. As students explore these sites, encourage them to add more words or phrases to their list:
  - Travel Channel: Speed Vision Videos Gallery  
<http://travel.discovery.com/guides/video/coasters/speedvision.html>
  - Discovery: Ride Through Time  
<http://dsc.discovery.com/convergence/coasters/timeline/timeline.html>

- Travel Channel: Build Your Own Coaster

<http://travel.discovery.com/ideas/themeparks/rollercoasters/buildacoaster.html>

3. Finally, have students use their notes to make up a poem, short story, song, rap, or other creative piece describing the experience of a roller coaster or other thrill ride, or related physical scientific issues. They might describe a specific ride, the experience of riding a roller coaster, or an imaginary ride of the future?

## Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- **3 points:** Students were highly engaged in class discussions; recorded many words, phrases, and images from the video; gathered several details from the suggested Web sites; wrote an engaging, thoughtful piece about the experience of riding a roller coaster.
- **2 points:** Students participated in class discussions; recorded some words, phrases, and images from the video; gathered a few details from the suggested Web sites; wrote a satisfactory piece about the experience of riding a roller coaster.
- **1 point:** Students did not participate in class discussions; recorded few or no words, phrases, or images from the video; gathered few or unrelated details from the suggested Web sites; created a simplistic or undeveloped piece about the experience of riding a roller coaster.

## Vocabulary

### electromagnet

*Definition:* An electrically produced magnet that can be turned on and off

*Context:* The roller coaster was launched by electromagnets.

### Linear Induction Motors (LIMs)

*Definition:* Large, flat magnets arranged along a track; used to generate thrust

*Context:* LIMs were first developed to launch spacecraft into orbit

### zero g

*Definition:* Short for "zero gravity"; a state of apparent weightlessness

*Context:* The roller coaster ride made it feel like zero g because the centrifugal force offset the gravitational force.

## Academic Standards

### National Academy of Sciences

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit <http://books.nap.edu>.

This lesson plan addresses the following science standards:

- Physical Science: Motions and forces; Transfer of energy



### **Mid-continent Research for Education and Learning (McREL)**

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit <http://www.mcrel.org/>.

This lesson plan addresses the following national standards:

- Science – Physical Sciences: Understands the sources and properties of energy, Understands forces and motion
  - Language Arts – Viewing: Uses viewing skills and strategies to understand and interpret visual media; Writing: Uses the stylistic and rhetorical aspects of writing
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### **Support Materials**

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>