



Assignment Discovery Lesson Plan Electricity's Attraction

Subject

Physical Science

Grade level:

6-8

Duration:

Three class periods

Objectives:

Students will

- share words, phrases, and images that describe the latest thrill rides;
- explore Web sites about roller coasters; and
- write a creative piece about a roller coaster or other thrill ride.

Materials:

- Computer with Internet access

Procedures:

1. As students are watching the video, ask them to write words, phrases, images, or sounds that reflect the experience of riding a roller coaster or thrill ride. Answers may include "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 following Web sites. They can learn about roller coasters through history, build their own roller, and see videos of rides. Encourage students to explore and address physical science issues of the rides, such as forces and motion, thrust, weightlessness, and zero g. As students explore these sites, have them continue to add to their list of words or phrases describing a roller-coaster ride.

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 construct a poem, short story, song, rap, or other creative piece describing the experience of a roller coaster or other thrill ride or related scientific issues. They can describe a specific ride, the experience of riding a roller coaster, an imaginary ride of the future.

Extensions for other video segments:

- **Magnetic Earth:** Have students explore the role of magnetism in items such as a floppy disk, compass, generator, electric motor, the Magna Doodle, electromagnet, maglev trains, anti-shoplifting devices, and Magnetic Resonance Imaging (MRI). Each student should create a detailed, labeled diagram to explain how that item works. A good place to start is the Web site "How Stuff Works" at <http://www.howstuffworks.com/>.
- **Electric Earth:** Write the following terms on the board: electrons, electricity, voltage, amps, watts, current, Hoover Dam, Ben Franklin, lightning, electromagnetism, aurora borealis, aurora australis, insulator, and conductor, rubber, copper. Have students work in small groups to define the terms. Then have each team design a game that uses at least ten terms. (*Examples may be a board game, card game, crossword puzzle, or mock game show.*) Have teams switch games with other teams and challenge other teams to play their games.
- **Electronics at Work:** As a class, discuss how the Utah Arm (or artificial myoelectric arm) works. (*It uses the electrical impulses in the body to operate and control the arm.*) How did the artificial arm help Bob Goodman, the man featured in the video? Do you think he could have done his job as a custom builder without the arm? Brainstorm other electronic devices that help people with health problems or disabilities. (*Examples include pacemakers, hearing aids, and electronic wheelchairs.*) How does each of these items help people live productive lives?

Evaluation:

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, and 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, and wrote an 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

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 national standards:

- Physical science: Motions and forces; Transfer of energy

The National Council of Teachers of English (NCTE) has developed national standards to provide guidelines for teaching English language arts, with the goal of promoting literacy. To become a member of the NCTE, or to view the standards online, go to <http://www.ncte.org/standards/standards.shtml>.

This lesson plan addresses the following standards:

- 4. Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.

Credit

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