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Resource ID#: 125970

Primary Type: Lesson Plan

## Energy Transformations at Santa's Enchanted Forest

This activity allows students to demonstrate their knowledge and understanding on forms of energy and transformations in a fun way. This lesson is based on an annual carnival in the community during the Christmas season. After learning about different forms of energy, how they transform from one to another, and the Law of Conservation of Energy they apply that to some of their favorite and popular rides at the carnival. This lesson allows for the arts in S.T.E.A.M. to be addressed.

### General Information

**Subject(s):** Science

**Grade Level(s):** 7

**Intended Audience:** [Educators](#)

**Suggested Technology:** Computer for Presenter, Computers for Students, Internet Connection, Interactive Whiteboard, Speakers/Headphones, Smart Phone/Tablet

**Instructional Time:** 4 Hour(s)

**Resource supports reading in content area:** Yes

**Keywords:** energy

**Instructional Component Type(s):** [Lesson Plan](#)

**Resource Collection:** FCR-STEMLearn Physical Sciences

### Lesson Content

**Lesson Plan Template:** General Lesson Plan

**Learning Objectives: What should students know and be able to do as a result of this lesson?**

The student will:

- identify and describe various forms of energy.
- analyze the transformation of one form of energy to another.
- demonstrate energy transformations within a system.
- demonstrate that during energy transfer heat is released.
- analyze and cite examples of the Law of Conservation of Energy.

**Prior Knowledge: What prior knowledge should students have for this lesson?**

Students should have an understanding of kinetic and potential energy and their relationship from sixth grade.

Students should have an understanding of friction as a force that opposes motion.

**Guiding Questions: What are the guiding questions for this lesson?**

- How is energy conserved in an energy transformations?
- Why is food referred to as fuel for your body?
- How can you tell a system has encountered friction?
- Based on the Law of Conservation of Energy what happens to the energy in a system when it encounters friction?

**Teaching Phase: How will the teacher present the concept or skill to students?**

It should be noted that this lesson works best when a fair or carnival is in your area for best student engagement. At the beginning of class the teacher will show a brief one or two minute video of a fair or carnival with rollercoasters, funslides and different rides along with other activity and food. These can be easily found online.

The teacher can select one of their favorites. The teacher will explain that various forms of energy were at work in the video.

At the beginning of whole group instruction the class will begin to create a KWL chart on forms of energy? The teacher will create a master chart of all the things the class currently knows on forms of energy and energy transformations. The teacher will then ask the class to discuss some things they would like to learn about in regards to energy transformations and energy conservation. The teacher will note this on the master chart while students record it in their science journals.

Students will then watch the Study Jams video entitled "Energy and Matter" at

<http://studyjams.scholastic.com/studyjams/jams/science/matter/energy-and-matter.htm>

After viewing video the whole group will verbally answer video quiz questions and teacher will provide feedback as necessary.

### **Guided Practice: What activities or exercises will the students complete with teacher guidance?**

Guided practice for this lesson requires Explorelearning access to Energy Conversions Gizmo

at <http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=651>.

Guided practice will be done in group settings. The teacher will complete the Energy Conversion Gizmo with one group while the second group works in two student teams using peer mentors for ELL, SPED and struggling students in guided reading. When the first group is completed with the teacher the students will rotate centers.

For paired reading the students can utilize the school text that covers forms of energy and transformations. For my class I use Review and Reinforce activity from Chapter 10.1 of Pearsons Grade 7 Science Interactive Text along with the Chapter reading.

Students should be allowed to add sticky notes to the Master KWL chart to update new questions they have or knowledge and understanding they have gained.

All work and notes should be neatly recorded in students science journal to be used as one resource in Independent Practice.

### **Independent Practice: What activities or exercises will students complete to reinforce the concepts and skills developed in the lesson?**

On the second day of lesson students should be provided various science textbooks to use in research. Access to computer and tablets with internet access if available should also be allowed for students. In groups of four students should be provided with sheets of butcher paper to complete their final product. Students will create a drawing of a selected carnival ride. On small slips of paper write Roller Coaster (if there is a famous local roller coaster use its name) or Fun slide. You should have enough for half the class to do one ride and half to do the other. Place in container and allow one student per group to select pull a paper for the group. Each group will create a model of their ride and all the energy transformations that occur. Students will use the internet and books as a resource. Students may use alternative energy sources such as windmills, solar power, nuclear power plant, coal power plant. They must identify as many energy transformations and explain them as possible from information gathered during previous days lesson and their current research. Groups will have to identify the starting point of their energy pathway and the ending point. They must explain how even though the ride ends how the Law of Conservation of Energy has not been violated.

### **Closure: How will the teacher assist students in organizing the knowledge gained in the lesson?**

Class will review KWL chart for new knowledge and understanding gained. Teacher will also look for any unanswered questions that may be unanswered.

### **Summative Assessment**

Students will create a drawing that models the Crazy Mouse Rollercoaster or Funslide. Students will identify the energy pathways of their models and explain all the energy conversions and forms of energy involved in the ride. Students will write an explanation how their model is an example of the Law of Conservation of Energy.

### **Formative Assessment**

Through out lesson the teacher will ask questions to assess student comprehension. After viewing Study Jam Video "Energy and Matter" the class will answer video quiz questions as a whole group.

During small group centers teacher will ask questions during Energy Transformations Gizmo.

Upon completion of Gizmo the individual small groups will answer the Energy Transformation Quiz.

During small group centers students will complete Review and reinforcement for Chapter 10.1 Pearson Florida Grade 7 Interactive Science.

### **Feedback to Students**

Teacher will provide direct verbal feedback and correction during teacher led activities and discussion.

Student individual work will be reviewed by teacher and feedback will be placed in writing on student work and returned for correction.

## **Accommodations & Recommendations**

### **Accommodations:**

Students will work with peer mentors to assist students with special needs. Accommodations will be made per student IEP. Instruction will use a variety of inputs and outputs and adjustments should be made according to individual students. Based on student ability oral presentations of poster and KWL can be presented to class, student made video to explain key concepts can be utilized.

### **Extensions:**

Students can construct a working physical model of a ride and complete a write up on its energy transformations.

With use of Explore learning Roller Coaster Physics Students can gather quantitative data to graph and analyze the law of conservation of energy.

<http://www.explorelearning.com/index.cfm?method=cSearch.actDoSearch&NewSearch=1&uncompiledQuery=roller+coaster&search=SEARCH>

**Suggested Technology:** Computer for Presenter, Computers for Students, Internet Connection, Interactive Whiteboard, Speakers/Headphones, Smart Phone/Tablet

### **Special Materials Needed:**

- Research Library with various text
- Butcher paper 3'x3'
- crayons
- markers
- colored pencil
- Flip Chart for KWL

**Further Recommendations:**

Teacher should analyze students for best grouping. Peer mentorship is imperative.

Additional Information/Instructions

**By Author/Submitter**

This takes 2 block periods

Source and Access Information

**Contributed by:** Adam Mack  
**Name of Author/Source:** Adam Mack  
**District/Organization of Contributor(s):** Miami-Dade  
**Access Privileges:** Public  
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**Aligned Standards**

Name	Description
<a href="#">SC.7.P.11.2:</a>	Investigate and describe the transformation of energy from one form to another.
<a href="#">SC.7.P.11.3:</a>	Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.