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## **Lesson Plans: Simple Machines, Odd Machine**

### **Wacky Inventions (Using Simple Machines)**

Submitted by Melissa Bell, Etna Elementary, Southwest Licking School District, Ohio

**Grades** 4-8

**Time Required:** 6 class periods, 45 minutes long

Engagement Activity: 25 minutes

Introduction: 20 minutes

Art Activity: 45 minutes

Research / Invention Activity: 2 periods, complete at home in 1 week.

Research / Invention Presentations: 2-3 min. per student (2 periods)

#### **Materials needed:**

For engagement activity: unfamiliar kitchen utensils/tools (1 per group of 3-4 students)

For Introduction to Rube Goldberg: Examples of Rube Goldberg inventions found at [www.rubegoldberg.com](http://www.rubegoldberg.com)

For Rube Goldberg Drawing Activity: crayons, colored pencils, rulers, pencils  
12 X 18" tag board (for final drawing of Rube Goldberg invention)

**Teacher Preparation:** Teachers should already have covered topics such as simple machines, economics, and research techniques. This project could be used as the end of a unit assessment on simple machines, sequencing, researching, or economics. It could be an introduction to studying inventions as well.

#### **Overview of Unit:**

The class will first be engaged with an activity involving unfamiliar tools used to complete a task. The teacher will provide enough utensils to provide each group of 3 to 4 students with one object to decide on its use and come up with two other uses for it. The groups will present their hypothesis of their object's use and its two other uses to the class after 10 minutes of brainstorming/collaborating.

After this engagement activity, the class can discuss other weird inventions, which will introduce the next art activity. The teacher will introduce Rube

Goldberg and his wacky inventions that made a simple task tedious. Then the students will make a Rube Goldberg type cartoon invention. Their task could be to turn on a light switch or any other task they want to accomplish. Their inventions will be an illustrated cartoon, much like Goldberg created with labels and captions. But students must have 3 simple machines, and 5 detailed steps for their invention.

After the art activity, the students will pick an invention to research that is interesting to them, make a real working model of their Rube Goldberg Invention, or make a new invention themselves. For the research project they will answer questions about the invention on the worksheet provided. Finally, after they work on their project for a week, they will present their invention/findings to the class in a 2-3 minute presentation.

Another option would be to make an advertisement for their Rube Goldberg invention. It could be a newspaper ad, a billboard sign, a television commercial, or a radio announcement. This project would teach about economic topics.

### **Learning Objectives and Educational Goals**

In this Wacky Inventions Unit students will:

- Work in groups to hypothesize, collaborate, and present their ideas on uses of and simple machines in an unfamiliar tool.
- Be introduced to wacky inventions by Rube Goldberg, an inventor, cartoon artist, sculptor, and author.
- Make a wacky invention cartoon to perform a task with 3 simple machines and 5 steps. Use labels to describe the sequence of activities in their picture.
- Research an invention, make a working model of their cartoon, or invent a new tool to perform a task.
- Present their findings or present their inventions they have made.

By constructing their own hypothesis about utensil uses, being exposed to the history of Rube Goldberg's work and making their own humorous cartoon inventions the students will learn:

- Critical thinking skills
- Collaboration
- The history of inventions in the art world
- The practical use of simple machines in everyday life
- Sequencing steps in a process
- Researching skills

## Procedure:

- I. *Engagement Activity:* Groups of 3-4 students will be given an unfamiliar tool/utensil to hypothesize its use, decide what simple machines are in the tool, and come up with two other uses for it. Each group will present their ideas to the class. Inventing will be discussed by touching on why we invent these tools.
- II. *Introduction to Art Activity:* Wacky cartoon inventions will be introduced by presenting Rube Goldberg's biography and works of art. The idea of making an invention perform a simple task will also be one of the topics discussed.
- III. *Art Activity:* Students will illustrate and label a cartoon description of an invention that will perform a simple task in 5 steps. Including and labeling 3 simple machines.
- IV. *Research/Invention Activity:* Students will either pick an invention to research, make a working model of their cartoon invention, or build a new invention.
- V. *Presentation:* Students will present their findings/ invention a week from the date it was assigned. Presentations will only be 2-3 minutes long. The researchers have specific questions to answer on the following worksheet.

## Extensions and Other Ties to Curriculum:

### Environmental Science Extension:

After the presentation of a variety of cartoon inventions, the teacher can talk about the significance and history of Rube Goldberg's inventions and how the inventions of today are technology based. Emphasize the differences in using natural things or tools around the house with manufacturing new technology. Use the book *Nature Got There First* by Phil Gates to discuss inventions that were based on the science of natural objects.

### Language Arts Extension:

Have students write out the directions to make a wacky invention. Then have them give these directions to another student to read and try to put together the invention.

### Multicultural Extension:

Introduce the book The Real McCoy: The Life of an African-American Inventor by Wendy Towle to relate inventions to other cultures. Make the reading of the book into a discovery/scavenger hunt.

To incorporate yet another viewpoint, the students may be introduced to the book From Indian Corn to Outer Space: Women Invent in America by Ellen H. Showell and Fred M. B. Arman. This book will give the girls in the class a role model and standard for achievement.

**Technology Extension:**

Since Rube Goldberg was skeptical of the technology being invented around him, he built these inventions that made a simple task difficult as a paradox for how he saw technology. Students could study the paradox of complexity and simplicity that Goldberg used in his inventions. They could research the history of technology and computers. It would be interesting for them to find out how computers evolved.

**Science Extension:**

Use the concepts related to inventions to create simple machines with levers, pulleys and ramps.

The following website provides a sample lesson plan:

<http://viking.stark.k12.oh.us/~greentown/simpmach.htm>

The following website provides interactive lesson plans/activities for students

<http://www.mos.org/sln/Leonardo/InventorsWorkshop.html>

**Art Extension:**

Students can study a different artist/inventor, Leonardo da Vinci. His renaissance work deals with a different component of art, perspective. A helpful website that involves interactive components is:

<http://www.mos.org/sln/Leonardo/LeoHomePage.html>

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