

LESSON 11

Introducing Rube

Goal 2. Simple Machines - The student will use scientific skills and processes to explain that simple machines such as levers, pulleys, and inclined planes reduce the amount of effort required to do work.

Essential Objectives: The student will be able to use science knowledge to make decisions and/or devise a plan to solve them. (MLO)

The student will use the following skills and processes of science:

- Access and process information from readings, investigations, and/or oral communication. (MLO)
- Provide supporting evidence when forming conclusions, devising a plan, or solving a practical problem. (MLO)
- Apply scientific concepts to make decisions. (MLO)

Teacher Background:

Rube Goldberg was a cartoonist that designed “invention” cartoons. The cartoons incorporated imagination, creativity, and problem solving. Goldberg’s drawings actually poked fun at technology and modern machines. His satirical cartoons included simple machines and ordinary household items to show his readers the progression of a task. The fascination with the drawings led to the “Rube Goldberg Machine Contest.” Individuals are challenged to design a machine using as many gadgets as possible to complete a task as simple as turning off an alarm clock or peeling an apple. Once designed, individuals explain the steps to complete the task.

Teacher Preparation:

- Make a transparency of TRG p. 68, “An Automatic Back Scratcher.”

Materials Provided in the Kit:

For Teacher Demonstration – None

For Each Group of Four Students – None

For Each Student - None

Materials Provided by Your School:

For Teacher Demonstration:

- Chart paper, markers
- Transparency of TRG p. 68, “An Automatic Back Scratcher”

Engagement:

1. Ask students if they are familiar with the board game, "Mouse Trap." Discuss responses. Inform students that this game made the simple, everyday mousetrap into a much more complex gadget that uses several everyday materials (e.g., ball, shoe, pipe) that work together to eventually catch the mouse.
2. Tell students that this idea was derived from a cartoonist named Rube Goldberg. Use the teacher background to inform students about who he was and what he did.
3. Show the transparency of "An Automatic Back Scratcher" to students and review the steps needed to scratch the man's back.
4. Encourage students to identify the simple machines they can find in the diagram.
5. Tell the students that they will use what they have learned about simple machines to create their own Rube Goldberg invention.

Exploration:

1. Students must decide upon a task that their invention could be used to complete.
2. Work with students to create a list of about 8-10 tasks the inventions could do.
3. Explain that they may select an idea from the list or choose a different idea.
4. Distribute Student Resource Packets and have students read the criteria for the Rube Goldberg Machine on SRB p.30, "Rube Goldberg Machine Criteria.
5. Clarify students' understanding of the criteria.
6. Have students select ideas for their machines and draw rough drafts of their machines on plain paper.
7. Students should use SRB p. 30 as a checklist before drawing final designs on SRB p. 31, "My Goldberg Machine."

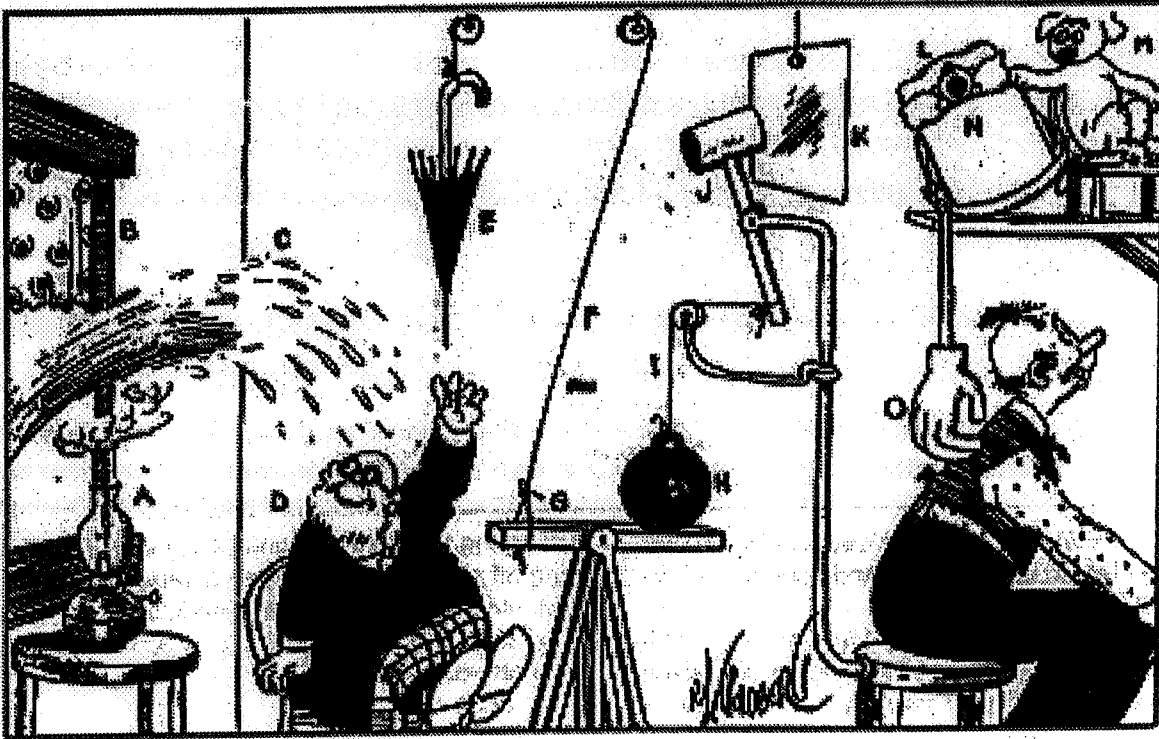
Explanation:

1. After students have completed their drawings and procedures, gather them in the discussion area and say:

Simple machines are a part of everyday life and are used to reduce the effort needed to do work. They usually make work easier, but today we tried to use them to make work more complex. Simple machines can be used alone or can be combined in a larger machine. For example, a car is a complicated machine that includes many simple machines such as a wheel and axle and levers. But, the wheels and axles alone cannot make the car move. It is the combination of all the simple machines and mechanical systems within the car that give it the ability to move.

2. Have students share their Goldberg machines and encourage them to highlight the use of the various simple machines.
3. Ask students to think of actual simple machines or tools that people use in everyday life to accomplish the same task.

An Automatic Back Scratcher



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Flame from lamp (A) catches on curtain (B) and fire department sends stream of water (C) through window. Man (D) thinks it is raining and reaches for umbrella (E), pulling string (F) and lifting end of platform (G). Iron ball (H) falls and pulls string (I), causing hammer (J) to hit plate of glass (K). Crash of glass wakes up pup (L) and mother dog (M) rocks him to sleep in cradle (N), causing attached wooden hand (O) to move up and down along your back.

RUBE GOLDBERG



Keep the Boss from Knowing You're Late

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