Lesson Title	Introduction to Simple Machines
Length of Lesson	One (50 minute) class period
Created By	Bo Cherry
Subject	General Science
Grade Level	7th grade
State Standards	7th: 1 b (Inquiry); 2 c (Physical Science)
DOK Level	DOK 2
DOK Application	Distinguish, Compare, Classify
National Standards	5-8: A (Inquiry); B (Physical Science)
Graduate Research Element	Simple machines are found everywhere in scientific research. The use of levers in rain gauges and drill bits for environmental drilling are two examples used in my research.

Student Learning Goal:
MS 7th Grade:
(Inquiry) 1 (b) Discriminate among observations, inferences, and predictions. (DOK 1).; (Physical Science) 2 (c) Compare the force (effort) required to do the same amount of work with and without simple machines (e.g., levers, pulleys, wheel and axle, inclined planes). (DOK 2)

National Science Education Standards of Content 5-8:
(Inquiry - A) Develop descriptions, explanations, predictions, and models using evidence; Think critically and logically to make the relationships between evidence and explanations; (Physical Science - B) Forces and Motion; Transfer of Energy.

Materials Needed (supplies, hand-outs, resources)
Computer, Projecter, Powerpoint (INSPIRE_Cherry_PP_10.15.11), Handout for note-taking and exercise (INSPIRE_HO_Cherry_10.15.11), ruler, something to act as a fulcrum, eraser to launch

Lesson Performance Task/Assessment:
Day One: This lesson will begin with a short powerpoint presentation on the various simple machines. This presentation will describe seven simple machines: pulley, lever, screw, wheel and axle, wedge, gear, inclined plane. The presentation gives examples of each simple machine, but discussion should be included to have students thinking about other possible examples. Also, students should volunteer to read the function of each simple machine as they appear on the presentation (the function is given on the handout).

Next, students will be asked to participate in an interactive game via the Promethean board on www.edheads.org (activity on Simple Machines). Time permitting, the class will complete two activities. Finally, a brief introduction to compound machines will follow, and students will complete the second page of the handout.
Day Two: Students are asked to get into small groups (3-4 students). Each group will design a compound machine which should consist of more than three simple machines. This machine must be authentic and useful in everyday life in order to accomplish a task. The students must draw the machine and describe all simple machines involved and how each simple machine works with the others to accomplish the task at hand. The groups will then have also create an advertisement for their invention, which they will perform at the end of the period.

Lesson Relevance to Performance Task and Students:
This lesson highlights the importance of simple machines in everyday life. The lesson serves as an introduction to forces, and how these simple machines make difficult tasks easier by decreasing the amount of force required to perform each task. Students are also challenged to think about some of these concepts during the second day by coming up with their authentic compound machine.

Anticipatory Set/Capture Interest:
In order to capture the interest of the students, a make-shift catapult can be designed to launch small objects such as erasers. Students are asked if this catapult is a simple machine, and this will serve as a segue into the lesson.

Guided Practice:
This lesson will be mostly guided the first day as the instructor will go through examples of functions of each simple machine.

Independent Practice:
The handout, to be done on day one, will be done independently. Also, the second day will be almost entirely independent as the students come up with authentic compound machines.

Remediation and/or Enrichment:
Remediation - Individual IEP; work in groups on handout
Enrichment - Have students find examples of simple machines in their own houses and report on how the simple machines make their lives easier

Check(s) for Understanding:
The instructor should be moving around the classroom in order to check the students' tables as each example is discussed. Also, the capstone activity on day two will serve as an opportunity to obtain formative feedback by talking to the groups about their compound machines.

Closure:
Question 1: How does an inclined plane actually lessen the amount of force required to move objects from lower to higher elevations?

Also, have students explain how multiple pulleys also lessen the amount of force required to lift heavy objects.

Possible Alternate Subject Integrations:
Physics, Physical Science

Teacher Notes:
Be sure to check for accessibility to www.edheads.org