Simple Machine Project

1. MAKE QUICK DRAWINGS OF THESE SIMPLE MACHINES:

* Lever
* Gears
* Pulley
* Wheel & Axle
* Ramp
* Wedge
* Screw

2. Simple machines can have 1 part to make 1 job easier, or many parts that work together to make a complex job easier. In fact, Rube Goldberg’s simple machines have many parts that make a simple job more difficult – and funny!

IMAGINE SIMPLE MACHINES YOU COULD BUILD!

<table>
<thead>
<tr>
<th>1 part to do 1 job, like a skateboard ramp</th>
<th>2 parts to do 2 jobs, like a hand-truck</th>
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<tbody>
<tr>
<td>3 or more parts to make a complex job easy (like an egg-beater)</td>
<td>3 or more parts to make a simple job complex (like a napkin folder)</td>
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3. Simple machines can make our school a better place. They can serve many purposes – to save energy, not pollute, or just to make us laugh or wonder. Look at what one student did!

This is a student-built Rube Goldberg 20-step machine for the home. The objective of this machine was to prepare a bowl of cereal for breakfast. This machine worked so well, that it was used by the student’s family to prepare bowls of Fruit Loops for weeks.

Think of what purpose you want your simple machine to serve for our school. Then, after you learn more about each kind of simple machine, use this sheet to plan your ideas carefully.

PLAN YOUR PROJECT!

Your final architect’s drawing is called a blue print. It can include arrows to show moving parts, and/or words to explain each step. Make sure the final blue print for your simple machine has at least 3 different simple machine parts – see the list on page 1.

Make 3 small, 1 minute sketches of different ideas you could try here:

Now pick 1 idea, and make a bigger, 10 minute drawing of your project on a full sheet of paper. Use a ruler and pencil so you can erase mistakes!
Simple Machine Project: Grade Yourself

<table>
<thead>
<tr>
<th>My Tasks</th>
<th>Exceeds Expectations 80% or more</th>
<th>Meets Expectations 65% or more</th>
<th>Doesn't Meet Expectations 64% or less</th>
<th>Grade I Should Get</th>
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<tbody>
<tr>
<td>Draft Ideas</td>
<td>Completed sheet with 3 or more good ideas</td>
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<tr>
<td>(Brainstorm sheet &amp; drawings)</td>
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<tr>
<td>Blue Print Drawing</td>
<td>Big drawing shows 3 or more parts, details &amp; all steps</td>
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<td>(Final draft of project)</td>
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<tr>
<td>Model of:</td>
<td>Runs without error &amp; achieves purpose</td>
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<td></td>
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<tr>
<td>(What I built)</td>
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<tr>
<td>Presentation to: _______</td>
<td>Showed &amp; explained project clearly</td>
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<tr>
<td>(Class? School? Others?)</td>
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</tbody>
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1. Three things I think I did well are:

   _____________________________________________________________
   _____________________________________________________________

2. Three things I could have done differently are:

   _____________________________________________________________
   _____________________________________________________________

3. Overall, my final grade should be (circle one) A  B  C+  C  C-  D  F

   because:_________________________________________________________________
   ______________________________________________________________________}

Science in Hawai‘i: Nā Hana Ma Ka Ahupua’a – A Culturally Responsive Curriculum Project
Retrieved and adapted 4/4/05 from:
http://www.usoe.k12.ut.us/curr/science/sciber00/8th/machines/sciber/rube.htm
TEACHER’S NOTES: SIMPLE MACHINE PROJECT

Use this sheet to introduce the project, motivate them as they study different kinds of simple machines, then to plan their project.

This project can be done by each student or in pairs. Supplies such as gears, pulleys, string, wheels and axles should be bought in advance. Students can also recycle cardboard, wood or metal parts, and use small hinges or springs, too, but remind students of safety – you may want to insist on nothing sharp, rusty or items that invite trouble, like mouse traps. The projects can be planned to be assembled with ease, or mounted on wood using wire, nails, or carpenter’s glue. Don’t forget you’ll need safe storage places for this option!

Go over the lesson hand-out, allowing students to look for answers in texts or from peers, and discussing answers are you go. Set time limits for drawings to 1 minute each or less (use a stop watch for added fun!). Do items 1-3, stopping before “Plan Your Project”. Collect student sheets for later or continue.

Go over the grading rubric next or after students have had several lessons & practice with various simple machines and they are ready to design their own. (Optional: use blank rubric below to let students plan different tasks &/or how to address expectations. You may want to include a criteria for students to provide a mathematical explanation of the mechanics of 1 or more parts of their project). This rubric does not show points or weight of each criteria – this can be decided as a class or by you, and added on the right of the rubric. Keep evaluation sheets for use after the projects and presentations are complete.

See Dream School Project/Solar Unit for more notes on rubric evaluation

ADDITIONAL TEACHER RESOURCES:
http://edtech.kennesaw.edu/web/simmach.html - links to these below & more

http://www.edheads.org/activities/simple-machines/simple-machines-pre-test.pdf - downloadable student hand-outs to assess understanding of simple machine types and examples

http://weirdrichard.com/inclined.htm - inclined planes by Lego

http://www.usoe.k12.ut.us/curr/science/sciber00/8th/machines/sciber/rube.htm
Rube Goldberg machine making activity and more at http://www.usoe.k12.ut.us/curr/science/sciber00/8th/machines/sciber/intro.htm

http://home.earthlink.net/~kandyhig/sm/ - interactive site with crosswords etc for review
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<th>Points</th>
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