Sc. 10 Unit 3: Student Notes Energy - Types and Forms

Name: _____Block: ____ Date Completed: _____

Part 1: Student Notes - Law of Conservation of Energy

Energy

Energy exists in _____

Energy can _____ from one object to another.

Energy can _____ from one form to another.

_____

What is Always Present But Never Visible?

Although energy isn't visible, you can detect _____

ex_____

Law of Conservation of Energy

With every transformation, _____. Energy conversions are not 100% efficient. The energy output for the intended purpose is seldom the same as the energy we put in.

Potential Energy

_____

Examples:

Kinetic Energy

_____

Examples:

Six Forms of Energy

Mechanical Energy

Chemical Energy

Electrical Energy

Heat (Thermal) Energy

Nuclear Energy

Light (Radiant) Energy

Energy Conversion

All forms of energy can be converted into other forms of energy

Energy Forms

Part 2: Assignment - Design and build a Rube Goldberg Machine:

A Rube **Goldberg machine** is a machine intentionally designed to perform a simple task in an indirect and overcomplicated fashion. Often, these machines consist of a series of simple devices that are linked together to produce a domino effect in which each device triggers the next one, and the original goal is achieved only after many steps.

Step 1: Design a Rube Goldberg Machine:

Each transformation of energy will earn you points:

Number of Transformations	1-2	3-4	5-6	7-8
	0-50%	50-68%	68-90%	90%-100%

Be sure to follow the guidelines for your energy transformation project:

Must be able to make a video of your machine and upload it onto your Canvas ePortfolio folder

Must be safe, not harm anyone, and should NOT cost you or your parents any Money

Must be appropriate

Must have a goal and you must be able to state the energy transformations in each step.

Good luck!

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Sc. 10 Unit 3 Energy Transformations

Rube Goldberg machine Rubric

Rube Goldberg Assignment

Learning Target:
I can design, build, and refine a device that converts one form of energy to another (Product).

Introduction:
Every time something in the Universe moves, heats, cools, or explodes, some form of energy is transferred from one piece of matter to another.
There are many different forms of energy, there are also a large number of ways to transfer it.
This project is designed to highlight your understandings of energy transfers by creating some of your own.

FIY:
Rube Goldberg (1883-1970) was a cartoonist who is famous for his drawings of marvelous inventions that did simple things. You are going to create a marvelous invention that uses many transfers of energy to do one simple thing.

Assignment:
Design and construct a Rube Goldberg machine using at least:

- 3 simple machines, which include a pulley, lever, wedge, screw, wheel and axle, and inclined plane) and
- 2 energy transfers to successfully complete an "end task." For example, your machine can:

· Pour water into a cup;
· Shut off an alarm clock;
· Put toothpaste on a toothbrush;
· Hit play on your iPod;

- · Put coins into a bank;
- · Ring a bell; or
- · Any number of things you could think of on your own.

You will be working at home (do your best) to complete this machine.
Machine "Rules":

1. The machine must complete a described task *(as reliably as possible).*
2. Your machine must have a title.

3. The machine must contain at least 3 simple machines and 2 energy transfers.
4. There is a minimum of 5 steps. There is no maximum number of steps.
5. The machine may use no live animals or hazardous materials.
6. The machine must not imply or contain any profanity, indecent or lewd expressions, or any illegal items.
7. Any loose or flying objects must remain within the set boundaries of the machine.

Final Presentation:
You will be presenting your final Rube Goldberg machine to the class by uploading it to your Canvas ePortfolio site.
Each student will be expected to be able to explain the energy transfers that occur in your machine.

You must also complete a written assignment as a conclusion to the project.
Written assignment should include:

- A picture of your machine labeling each step with A, B, C...
- A written explanation of each step.
- A description of the energy transfers.
  Review the "Energy Transformation" notes for specific information about each transformation.

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Grading:

Rube Goldberg Rubric:

	4 Exceeding Expectations	3 Meeting Expectations	2 Developing	1Beginning
Energy Transformations	Includes 2 energy transformations	Includes at least 2 energy transformations.	Includes at least 1 energy transformation.	It does not include any energy transformations.
Machine Types	Includes at least 3 machine types. Each machine is used as a true, different simple machine	Includes at least 3 machine types. Each machine is used as a true simple machine, but some machines may repeat	Includes at least 3 machine types. Some machines are not used as true simple machines.	Less than 3 simple machines.
Machine Process	Includes at least 5 distinct and separate steps to accomplish the task.	Includes at least 5 steps to accomplish the task, but a few steps seem to blend together.	Includes at least 5 steps to accomplish the task, but many steps seem to blend together.	Includes less than 5 steps to accomplish the task.
Reliability	The machine works reliably every time and does not require human intervention.	The machine works reliably but required human intervention at some point.	The machine frequently does not work.	The machine does not really work.
Introduction	Machine has a name and the steps of the machine are explained to the viewer.	Machine has a name and the steps of the machine are not clearly explained to the viewer.	Has inappropriate name or the steps of the machine are not explained to the viewer.	Has inappropriate name and the steps of the machine are not explained to the viewer.
Creativity	Rube Goldberg Master! A novel and amusing idea!	A Rube Goldberg Apprentice! Interesting, but no "wows!"	A straightforward implementation.	A straightforward implementation.
Written Explanation	Picture and written explanation are well written, amusing and follows Rube Goldberg's format.	Picture and written explanation are included and follows Rube Goldberg's format.	Picture and written explanation are included but does not follow Rube Goldberg's format.	Missing written explanation and/or picture.

Comments: