

Module 4: Energy

Module 4 Assessment

Rube Goldberg was an engineer and cartoonist known for his illustrations of complicated contraptions for doing simple tasks. His legacy lives on through annual contests as well as recent advertisements and music videos.

Your task is to design a device in the manner of Rube Goldberg that will take at least eight steps, utilizing at least four different forms of energy, to turn on a light switch.

For your invention, you must include:

1. A diagram of the device.
2. A description of each component in the device and how it works.
3. A descriptive analysis of each energy transformation.
4. A mathematical analysis of at least two of the energy transformations, using reasonable values.

Remember, you are not to simply copy something you've seen, but instead must come up with an original contraption in the spirit of Rube Goldberg.

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Rubric

Points	5	4	3	2	1
Overall originality of concept	A device that demonstrates both originality and creativity	A device which is mildly creative or engaging.	A device which is not overly creative or engaging.	A device that lacks creativity	Device clearly copied and lacking originality.
Diagrams and illustrations	Diagrams and illustrations are neat, effectively present the device and its functions, and includes relevant dimensions and measurements. Could be directly converted into a working machine	Diagrams and illustrations present the device and its functions, and include most relevant dimensions, but would need additional development before handing over to a builder.	Diagrams and illustrations are mostly complete, but contain some confusion and/or are missing some relevant dimensions. Not ready for build team.	Diagrams and illustrations are somewhat unorganized and are missing key dimensions and are not effective in representing the device and its functions.	Diagrams and illustrations missing or completely failing to present the device and its functions.
Descriptive analysis of energy transformations	Each energy transformation is correctly and completely described, including discussion of efficiency of energy transformations.	Energy transformations generally correctly described with some mention of efficiency.	Descriptions lacking one or more key aspects of energy transformations and efficiency.	Descriptions demonstrate an incomplete understanding of energy concepts.	Descriptions not included or demonstrate lack of understanding of energy concepts.
Mathematical analysis of energy transformations	Analysis clearly presented and includes detailed calculations of energy transformations	Analysis presented mostly clearly with acceptable calculations of energy transformations of somewhat reasonable magnitudes	Analysis contains one or more minor errors, yet mostly presents energy transformations of reasonable magnitude	Analysis not clearly presented, and energy transformations represent unreasonable magnitudes	Analysis missing or resulting in unreasonable energy calculations