long beach unified school district

SCIENCE & ENGINEERING FAIR

Rube Goldberg Device (6th - 8th Grade)

Rubric for School Site Fair

	Attempted 1	Proficient 3	Advanced Proficient 5
Task	The device performs a simple task that has no practical value.	The device performs a simple task some people would find practical.	The device performs a task that is moderately complicated, or that many people would find practical.
Research	Cites two or fewer sources of information about energy, or uses the wrong format, or uses only one type of information resource. Makes little or no connection to the actual energy transformations of the device.	Cites three or more sources of information about energy in the correct format, using at least two types of information resources. Makes a general connection to the types of energy transformations of the device in the student's own words.	Cites four or more sources of information about energy, in the correct format, using at least three types of information resources. Makes clear and well-elaborated connections to each energy transformations of the device in the student's own words.
Preliminary Design	Diagram and notes show limited progress toward making a working device, or have fewer than eight energy transfers, or use only two or three types of energy.	Diagram and notes show a proposed device with at least eight energy transfers using four types of energy.	Diagram and notes show a proposed device with at least ten energy transfers using five or more types of energy.
Obstacles x2 *(double points)*	Fails to analyze obstacles related to the practical design, construction, and stable function of the invention (i.e., may list obstacles that refer only to shopping for materials or cosmetic issues).	Provides adequate analysis of the obstacles related to the practical design, construction, and stable function of the device.	Demonstrates in-depth analysis of the obstacles related to the practical design, construction, and stable function of the device.
Final Design with Key x2 *(double points)*	Drawing is not rendered in ink, or is unclear or incomplete in showing the operating pieces and structural supports. Or, the labels and explanations for the energy transfers are significantly flawed.	Drawing is made in ink. It reasonably represents the operating pieces and the necessary structural supports. Energy transfers are labeled and explained with minor omissions or mistakes.	Drawing is made in ink. It clearly shows each operating piece and the necessary structural supports. All energy transfers are well labeled and explained.
Reflection	Student fails to describe both challenges and rewards of the project, or omits or makes unclear applications to personal strengths and possible career goals.	Student describes some challenges and rewards of the project, making applications to personal strengths and possible career goals.	Student clearly describes challenges and rewards of the project, making numerous applications to personal strengths and possible career goals.
Device Operation x2 *(double points)*	Live device (or video recording) does not demonstrate complete operation without a break and without assistance after starting the device. Student narrates, from start to finish, the transfers of energy from object to object, but has significant omissions or inaccuracies.	Live device (or video recording) shows complete operation without a break and without assistance after starting the device. Student narrates, from start to finish, the transfers of energy from object to object with minor omissions or inaccuracies.	Live device (or video recording) proves complete and reproducible operation without a break and without assistance after starting the device. Student narrates, from start to finish, the transfers of energy from object to object without omissions or inaccuracies.

(Projects will receive between 10 and 50 points when all rubric criteria have been addressed.)

Task												
Research												
Preliminary Design												
Obstacles *(double points)* **x2**												
Final Design (with key) *(double points)* **x2**												
Reflection												
Device Operation *(double points)* **x2**												
Total Score												

Rube Goldberg Device
(6th – 8th Grade)
Judge's Score Sheet for School Site Fairs

Period:																							
Teacher:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:	Student(s):	Project:

NOTES TO TEACHER: For grading purposes, 5-10 pts = Not Proficient (1), 11-24 pts = Partially Proficient (2), 25-39 pts = Proficient (3), 40-50 pts = Advanced Proficient (4).
Complete grading should also include other details not included here as Judging Criteria: for instance, written evidence of drafts, completion of deadline tasks, display guidelines, model quality, etc.

Energy Forms to Use in Rube Goldberg Device Projects:

Potential Energy (Stored) Forms

- Gravitational ..... in height
- Chemical ..... in the bonds of fuels/foods
- Elastic..... in stretched or compressed objects
- Electrostatic..... in charged objects
- Magnetic ..... in magnetized objects
- Nuclear..... in the nucleus of atoms

Active Energy Forms

- Mechanical (Kinetic) ..... moving objects
- Electrical ..... moving charges
- Thermal ..... moving atoms/molecules
- Electromagnetic ..... moving photons