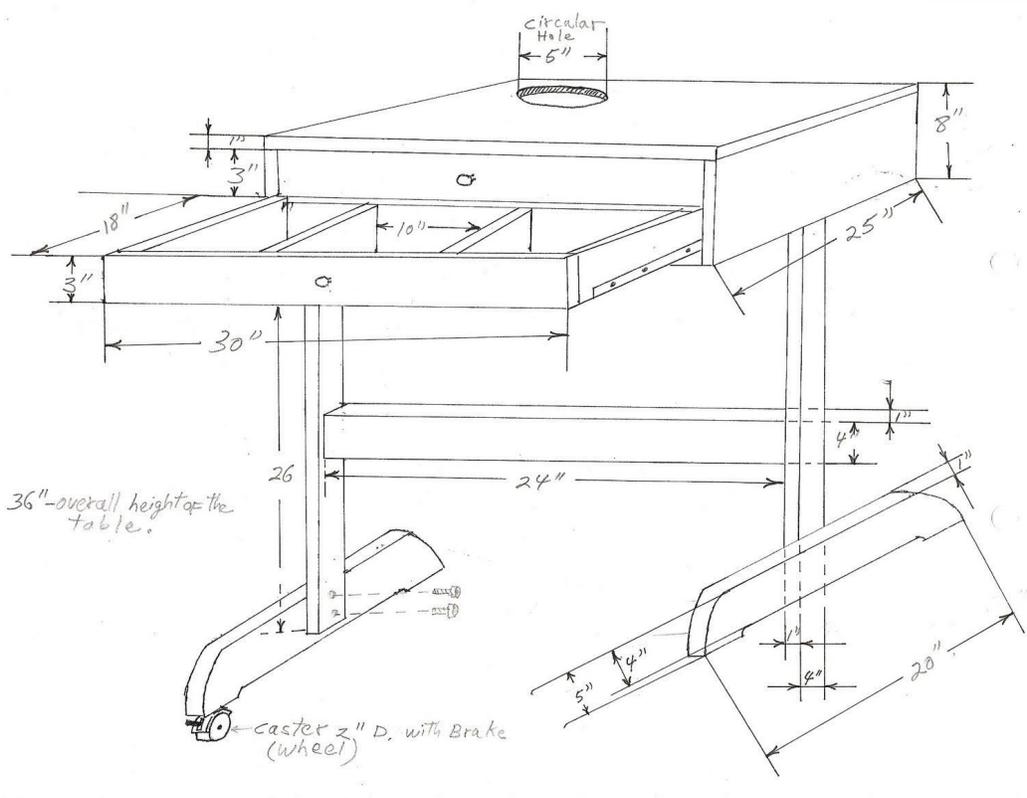
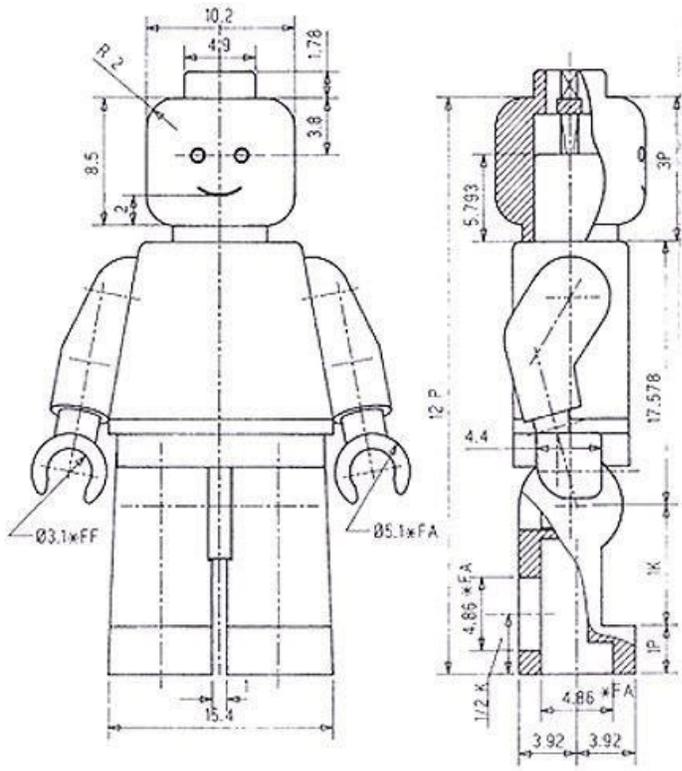


Energy Transfer Machine Design Notebook Check

****do not build anything, this is just a design****

Category	1	2	3	4	5	Score
Titles and Names	Missing 4 + parts.	Missing 3 parts	Missing 2 parts	Missing 1 part.	Team Name, Team Members names, Role of each member and their strengths, Team Leader's science teacher	
Drawing	Missing 4 + parts.	Missing 3 parts	Missing 2 parts	Missing 1 part.	<ul style="list-style-type: none"> - Has a scale drawing of their Machine. - Includes units of scale and units for actual Machine. - Includes type of materials they plan to use. - Includes where they plan to purchase materials or where they will find them. - Drawing is neat and easy to understand. 	
Research Section	Missing 4 + parts.	Missing 3 parts	Missing 2 parts	Missing 1 part.	<ul style="list-style-type: none"> - Research section includes information on Rube-Goldberg Machines or energy transfer devices. - Includes 3 paragraphs. - Includes at least 3 websites. - Has first page of each website printed out and attached into notebook. 	
Machine Planning	Attempted the plan but does not include the required three plans..	Discusses all three points but none are done well.	Missing 2 parts/2 parts not done well.	Missing 1 part/1 part not done well.	<ul style="list-style-type: none"> - Includes an explanation for how each energy transfer will occur in your machine. - Explains what energy transfers will occur in order in your machine. - Clearly identifies what simple task the machine is to perform. - Explains how the use of electricity from a battery is used. 	
Creativity	No theme evident	Missing 3 parts of theme	Missing 2 parts of theme	Missing one part of theme	Has specific theme for project: <ul style="list-style-type: none"> - Paint/décor uniquely themed - Clothing/Costume theme - Set up of machine - Use of unconventional materials. 	
					Total	/25

COMMENTS:





Energy Transfer Machine Rules

The Energy Transfer Machine is an event that provides student teams the opportunity to transform everyday household materials into unusual Rube-Goldberg type machines. This machine should accomplish a team-specified task as close to the one minute mark as possible using a variety of energy transfers including power from a battery.

Competition Structure

Each team of 2 to 4 students is responsible for designing and building a Rube-Goldberg machine or Energy Transfer (ET) machine using household objects. The machine should accomplish ONE simple task of the team's choice. The challenge is to construct the machine such that it completes this simple task as close to the one minute mark as possible.

Eligibility requirements:

1. Each competing team consists of 2 - 5 students in grades 6 , 7 or 8
2. The competition is divided into separate divisions for each grade level.

Construction requirements: The machine shall...

1. Perform a team-specified task at the one minute mark as the final step of the machine.
2. Have a minimum of FIVE steps in completing it's team-specified task with at least one step powered by electricity provided by a battery (Not to exceed 9 volts).
3. Demonstrate a series of energy transfers. Identical transfers of energy in succession (such as a row of dominoes falling into each other) is counted as one energy transfer.
4. **The team's Energy Transfer Machine is not to be transported to the competition.** Therefore the size, shape, and dimensions of the machine are not limited. However, it must be designed so that it is possible to videotape the performance of the machine from start to finish with a single video camera without using cuts or editing.
5. Not use any actual timing devices manufactured for that purpose.
6. Be constructed solely of parts provided by the team. Individual components can be purchased, but the entire timing apparatus must be designed by the students. All component and fabrication choices must be made by the student team members.
7. Not use animals, hazardous materials, explosives, or flames.
8. Not imply or convey indecent, lewd or profane expressions.
9. Be safe and not harm team members, spectators, or equipment.
10. All teams will be required to submit a Design Notebook AND Data notebook to be able to compete.

Projects that are deemed unsafe will be disqualified.

Video Requirements

1. At least one team member is required to narrate and be on-screen in the introductory segment.
2. In the introductory statement the narrator must state the following:
 - a. School Name
 - b. Project Name
 - c. How Electricity is used in their machine.
 - d. Describe the Energy Transfer that occur in their machine.
 - e. What it will do as its final, team-specified task at the one minute mark.
3. As the steps of energy transfer are described by the narrator, those areas of the machine pertaining to that step should be pointed out by the narrator and shown in camera view. This portion of the video should not exceed 3 minutes. At the beginning of the machine sequence, the narrator must say "Ready, set, go!" for official timing process to begin.
4. No edits are allowed to the machine portion of the video from the point where the narrator says "Ready, set, go!" to the completion of the Energy Transfer Machine's final task. A complete run must be documented in this fashion. **Any edits to this portion of the video will be grounds for disqualification.**
5. **If any team member interacts with, interferes, or assists their machines once time has started, the machine timing (for precision) will stop at that point.**
6. The clock will be stopped and time recorded when the team designated, one-minute, final task occurs.
7. It is expected that the video of your most successful run (from start to finish - no edits) will be submitted for judging on competition day. Take advantage of the opportunity to videotape your machine multiple times to get the best run documented.

Data Notebook

The team is required to keep a data notebook that must be turned in prior to the competition in order for them to compete the day of the Sun Games. Below is the items that should be included in the data notebook.

1. Title page with company design, name of the Energy Transfer Machine, student names and teacher name(s).
2. What adults helped you create this and how did they help?
3. You must have multiple dated entries that give the dates when you worked on the project and what you did each time.
4. Provide time measurements from trials performed while perfecting the machine.
5. You need to have scaled drawings with measurements of your machine as well as the supplies you used.
6. You must include a section that explains where you got your ideas from. This could include pictures, websites, or people. Be specific.
7. Identify the energy transfer that occur in your machine.
8. You must discuss what your greatest challenge was and how you overcame it.

Competition Day

Display spaces will be outdoors. Teams are encouraged to bring umbrellas or canopies for shade. Each team will have a 'booth' space ten feet wide, in which to showcase their machine. The teams will be judged on their designs, as well as how close to the one minute mark their team-specified task is performed. Judges will be looking for knowledge of energy transfer design. In addition, the team should have an understanding of their choice of materials and how those materials affect the energy transfers that occur in their machine.

Judging Criteria: Design and Energy Transfers

- *Energy Transfers- Does the machine have at least 5 energy transfers, one of which are powered by electricity provided by a battery (9 volts or less)?*
- *Does the machine demonstrate complexity and technical sophistication?*
- *Does the machine demonstrate creativity, originality and unconventional material use and design aesthetic?*
- *Design Function--How well does the design function according to team specified energy transfer goals?*

Judging Criteria: Precision

1. *How close does the machine accomplish the team-specified task to the one minute mark?*

Energy Transfer Machine Awards

The awards will be as follows:

- 1st Place - Design
- 2nd Place - Design
- 3rd Place - Design
- 1st Place - Precision
 - o This award will be given to the one team that achieves the closest time to the one minute mark.