THE 4th ANNUAL

Ruby AWARDS

"Honoring the best in nonsensical energy transforming chain-reaction contraptions"

Who was Rube Goldberg?

(1883-1970), a Pulitzer Prize winning cartoonist, sculptor, author, and engineer. Rube Goldberg created machines in his cartoons that would certainly be a challenge to construct in real life. While most machines work to make difficult tasks simple, his inventions made simple tasks amazingly complex.

What is the Rube Goldberg Project all about?

For this project you will form a group of 2-4 FHMS 6th graders and demonstrate your knowledge of CHEMNRS energy transformations and the six simple machines by:

1) **building a working chain reaction contraption containing at least eight unique (non-repeating) steps of energy transformation.**
2) **recording its performance in a well-lit, non-shaky video. The energy transformations need to continue for 15- 60 seconds.**
3) **producing a poster visual aid describing the energy transformations at each of the eight steps of your contraption**

Parents are STRONGLY encouraged to be involved in this project for safety and creativity decisions **!!!**

Your video and poster will be DUE

February 7th

FORM YOUR GROUP fill out the form below for **each** group member		
Name	**Phone #**	**email**
1.		
2.		
3.		
4.		

Your projects will be judged on the following:

Difficulty – Your contraption needs to be **at least eight unique** steps in length. Use the list in the packet for inspirational help. You should use as many different simple machines and energy transformations as possible. The machine MUST continue working for at least 15 seconds and no longer than 60 seconds. (40pts)

Creativity – Did the project include unexpected or artistic steps? Did the steps flow together in a way that was fun or interesting to watch? Was the action spread out over a long distance? Were there steps with various speeds…some that went fast while others that made you wait with anticipation? (20pts)

Video production – Did your use of the camera (and computer) make the video fun and easy to watch or did it get in the way? Did you hold the camera still or was it shaky? Did you hold the camera horizontally instead of up and down? Is the picture right side up? Can we clearly see each step of the well-lit project? Was everyone in the group introduced on camera? (20pts)

Poster visual aid – Did you document your project accurately and use science vocabulary well when describing each step? Are each of the energy conversion steps clearly drawn, labeled and described? Is it large enough to see? Did you record WHEN (at what time in the video) each step occurred? Did you include your creative title? (20pts)

RESEARCH

Rube Goldberg contraptions are online all over the place. YouTube can be a great research tool when used properly! My YouTube Channel is linked on my website and can be found at http://www.youtube.com/user/ProjectEpiphany . Look under "playlists" for some Ruby Award entries from past years as well as the professionally made contraptions that we played in class.

Be aware that the guidelines and rules have changed over the years so just because it's there doesn't make it a "good" project.

Gather ideas for your machine from the videos you like. Modify steps to fit the things you have to work with. **The bottom line is…choose steps that you think you can build using the parts you have around the house.**

Plan out your steps

Here are just SOME steps to get your creative juices flowing			
1st class lever (see saw)	2nd class lever (scissors)	3rd class lever (hammer, club, bat)	Diet Coke / Mentos
eggs breaking/rolling	catapult	trampoline	Slinky
Nerf gun	ramps	rope on a ceiling fan	train set
lamp	sailboat	dominos	bell
automatic golf ball returner	vinegar/baking soda	candle burning through a string	trash can foot pedal/lid
pendulum	Zhu zhu pet	mouse/rat trap	marble set
liquids flowing	zipline	balls rolling/bouncing	fan/ hair dryer

The following items MAY NOT BE USED

unless there is an adult VISABLY HELPING ON THE VIDEO.

FIRE (so you don't burn down the house or garage)

EXPLOSIVES (so you don't blow off your fingers and toes)

SHARP PROJECTILES (so you or your partners are not shish-kabobbed)

EXTREMELY HEAVY OBJECTS (so you are not crushed)

Basic advice for a successful build:

● This project requires a great deal of trial and error so try to build steps that are easy to set up again, and again and again. These machines will often try your patience so have a short resetting time.

● The messier the step is, the later in the chain it should go so you have fewer times to clean it up.

● Difficult steps should be closer to the beginning as you don't want to have to reset the entire contraption when one step refuses to work.

Basic advice for a successful video:

● Hold the camera/phone like  not like  .

● Put battery, tapes, and memory card into the camera before you start. There is nothing worse than missing the "perfect take".

● Use a tripod whenever possible (just say NO to shaky-cam)

● Make sure the record button is ON and the lens cap is OFF

● Show off the contraption before you begin and don't cut it off too quick after it is finished.

● Find the perfect distance (zoom) away from the machine. Don't get too close but don't stand too far away either.

● Follow the machine's progress slowly. If you move too fast, the image blurs. We want to SEE your contraption at work! This video is the only lasting evidence of your project. It needs to be well done.

● If possible, record the contraption from different angles so you can see all of the action. Edit the angles together for an awesome looking video. (HINT: try to edit the clips so that the action is seamless

How to turn in your project

Capture or copy the video into an editing program like Windows Movie Maker or imovie(there are many editing programs out there for free). With a little effort you will have a finished video file **not longer than 1 minute.**

YouTube is filled with helpful tutorials in case you are stumped while using an editing program. Feel free to email me at any time to help you troubleshoot your software issues.

File Types: **Most files will be 10 - 200 Mb in size and be one of several video languages (.avi .wmv .mov .mp4 .vob .3gp or .m4v are common). Please DO NOT** send a small .MSWMM file. These are the instructions for your computer to make a movie but it is not a movie.

File Names: Eventually you will have a finished file to email to me. Your file name must include: **1) creative title 2) all group members first and last names** Unique titles like "*How to trap a Mouse*" or "*The Mentos Volcano*". If everyone calls it "Rube Goldberg Project" I will not be able to track down groups and grade them efficiently.

An example filename is:

A Better Mousetrap (Albert Einstein, Isaac Newton, Thomas Edison, Rube Goldberg)

Getting the file to school:

Do not leave it on your phone.

Do not burn a DVD or data cd.

Carry it to school on a flash drive.

Email the file to Mr. Hughes at…

Jason.hughes@fhsdschools.org