

Conversion Contraption

Purpose:

To design and build a contraption using as many different forms of energy and as many energy conversions as possible.

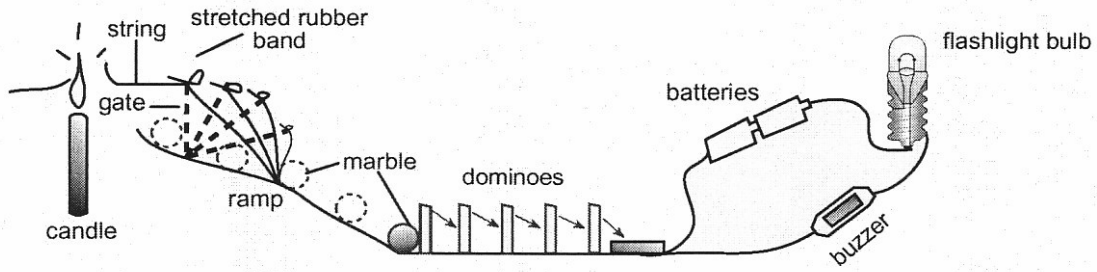
Rules:

1. The contraption should be mounted on a **base** no larger than **80 cm by 80 cm**. The height may be no higher than **150 cm**. The dimensions of the contraption can be no larger than 80 cm x 80 cm x 150 cm (height). Project will be disqualified if dimensions are greater than specified above.
2. At least three (3) forms of potential energy (PE) must be converted to kinetic energy (KE).
3. At least five (5) different objects must pick up mechanical kinetic energy. (Think moving parts)
4. Heat, sound, light, and electrical energy must be included.
5. Any form of energy may begin the process and new forms may be introduced along the way and any form of energy may end the process.
6. Once the action begins, the contraption should be designed to run without assistance. (If needed, however, each group is allowed one "assist" along the way with 5 points deducted for the assist.)
If more than one assist is required, contraption is disqualified.
7. A project notebook is required that includes
 - a) Cover sheet
 - b) A diagram of the sequence of events and an energy conversion analysis. The diagram shows the parts of your contraption while the analysis shows the energy conversions involved during each part.
 - c) Materials list.
 - d) Log or diary of time spent planning, building and testing project.
8. An example of a Conversion Contraption from Carnegie Science Center is shown below.

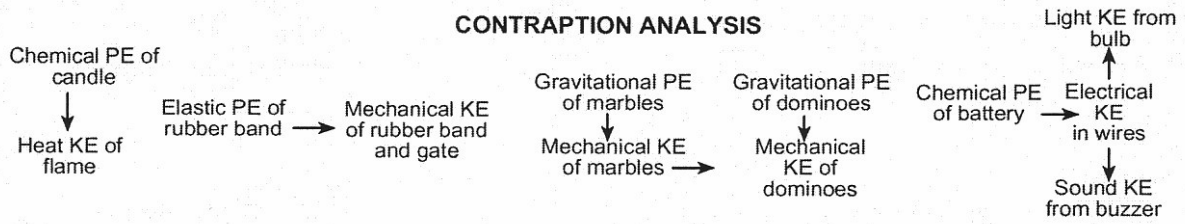
FIGURE 1 Energy conversion diagram and analysis

Kinetic Energy = KE
 Potential Energy = PE

CONTRAPTION DIAGRAM



CONTRAPTION ANALYSIS



Conversion Contraption Scoring Rubric

Team # _____

Division: _____ Middle School (Grades 6-8)
 _____ High School (Grades 9-12)

Specify grade: _____
 Specify grade: _____

Name(s) of Students: _____

School: _____ Division: _____

Does the Contraption Work (60 Points)	Possible Points	Actual Points
	(Yes)	(No)
Meets dimensional Specifications		
5 Point deduction for each minimum requirement missing:		
3 Forms of PE to KE	-5 up to -15	
5 Objects to pick up mechanical energy	-5 up to -25	
Includes heat, light, sound, electric	-5 up to -20	
Deduction for one assist	-5	

5 Extra Points for each additional energy conversion	
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Project Notebook (30 Points)	Possible Points	Actual Points
Cover Sheet	2	
Diagram and energy conversion	15	
Materials List	3	
Time Log	5	
Neatness and Organization	5	

Presentation to Judges	Possible Points	Actual Points
	10	

TOTAL PROJECT POINTS	
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Reasons for Disqualification: Did not meet dimensional specifications
 Required more than one assist