

Strand: 8.2	Standard: 8.2.3	Episode 2	Anchor Phenomena: The kinetic energy of an object changes as energy is transferred to or from the object.
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Title: Rube Goldberg	Time: 45-90 min	CCCs <u>Energy and matter</u>	Practices Engage in Argument
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Narrative of episode:

Students will explore the idea of transfer of energy by building simple rube goldberg machines. They will use **evidence** to **argue** the transfers of energy that are occurring in order to cause the motion for the machine to work.

Gather:

Ask students in groups to identify as many types of energy as they can. Create a master list on the board of the different types of energy and have the students add anything that they missed.

Reason:

Show students a rube goldberg video (possible choice, [OK GO this too shall pass music video](#)) ask them to focus on what caused the next motion. After the movie ask them to give examples of when they saw these.

Teacher note: if you are short on time and don't have time for them to design and build the rube goldberg machines you can use the video and have them pick a section of the video with 2 transfers of energy, draw it and explain the transfer of energy taking place in that particular part then have them share it with the class. This would shorten the activity to one 45 minute day.

Provide students with possible items that could be used in a rube goldberg machine that they can use to build their own machine. Explain that the machine needs to transfer energy 2 times meaning it goes through 3 types of energy to accomplish a task. You can decide if they are all going to do the same task or if they are each supposed to come up with their own idea. If you are short on time I recommend assigning them the task to complete. Ideas could be: ring a bell, push a paper in a garbage can, pop a balloon, dropping alka-seltzer in a glass of water.

Have the students work in small groups of 3 to come up with a blue print of their design. Be sure they have labeled the transfers of energy and then have them start building it.

Communicate:

Once the students have built their rube goldberg machine have them explain for the class the transfers of energy that are taking place and demonstrate their machine.

Assessment: can the students correctly identify the changes in energy happening to cause the objects to move. They should identify things like: potential (both gravitational and elastic) energy, kinetic energy, friction, etc.

Materials, resources, handouts, etc:

- Any materials you have that could be used for building a rube goldberg machine. Examples of things could be;
 - Small mouse traps
 - Marbles
 - Wind up toys
 - Bouncy balls
 - Golf balls
 - Rulers
 - Tape
 - dominoes
 - Hot Wheels type of car
 - Wind-up toy String
 - String
 - masking tape
 - Coffee stirrer sticks
 - Balloon
 - Rubber bands
 - Plastic cup with water
 - Alka-Seltzer tablet
- Any other items you have they they could use
- A paper for them to draw their blue print on.