Define and Inquire

What is the purpose of the product?

The purpose of the product is to demonstrate energy conversion. It can be a child's toy or a general fun mechanism.

Who is the intended audience?

The intended audience are people who want to purchase a product that is satisfying and fun. The main groups are younger adults and teenagers. These people generally have some disposable income and are willing to spend their money on a fun gadget. In addition, the product can target teachers – specifically, science and physics teachers – who want to demonstrate energy conversion.

What are the environmental impacts?

The design will not be produced in large quantities and the prototype will not contain hazardous materials.

Is the product durable and safe?

The product will be overdesigned in order to prevent sudden and unwanted disassembly. In addition, if possible, magnets will be used instead of screws for modular pieces in order to prevent wear. Easily damaged or worn parts will be easily replaceable. If possible, screws will be used instead of adhesives or nails.

How is the product original or created using creativity?

I will be taking the mechanisms of various products in existence, and then combining them into a novel, coherent product. Before people critique me for just copying and combining existing technologies and marketing it as a novel invention, I would like to point towards the iPhone as an example of a widely recognizable product that was a result of a similar process.

What precedents inspired you?

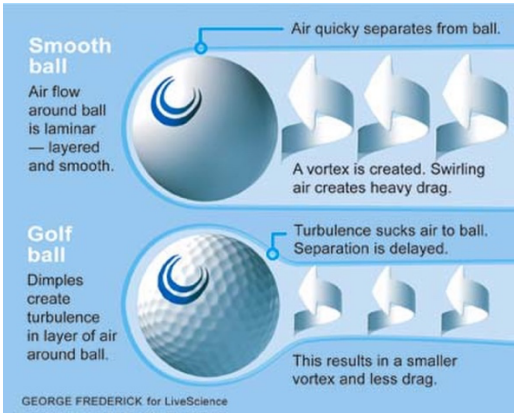
Airzooka Air Blaster

https://a.co/d/3dKYZyp

This is an Airzooka Air Blaster. It consists of an elastic strap, tube, plastic shield, shield handle, and tube handle. The shield handle is pulled back and released to blast a ball of air towards the target.

Boeing 787 Engine

This is a Boeing 787 engine. The engine has spikes or teeth in the back in order to disrupt the airflow so that smaller vortices form. By forming smaller vortices, the engine is quieter and the air flowing out the back is smoother.



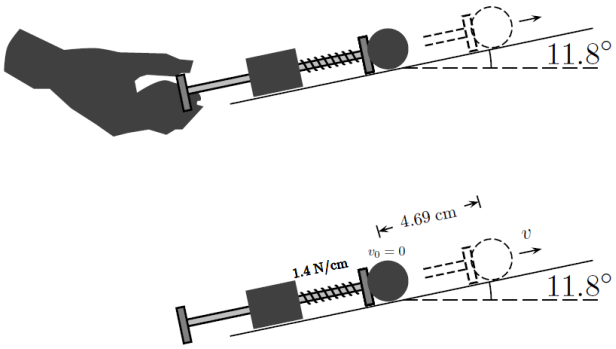
Golf Ball

This is a diagram explaining how dimples on a gold ball help it travel farther. By making a ball dimpled, the ball will form smaller vortices on the surface, thereby increasing range and decreasing drag.

Marble Music Machine

https://www.youtube.com/@Wintergatan/videos

This is a marble music machine made by Wintergatan. The machine moves marbles up, which are then dropped down onto what is essentially a xylophone in order to play music.



Pinball Machine Launcher

This is the mechanism used by a pinball machine to launch the pinballs. The ball goes in front. Then, a rod is pulled back. This tightens the spring, so that when the rod is released, the entire mechanism travels forwards to launch the ball.

Gun Barrel

A gun barrel has a spiral pattern along its barrel in order to spin the bullet when it leaves the chamber. By spinning the bullet, the bullet is able to achieve a more stable flight path.

Maracas

Maracas consist of an outer shell, handle, and loose objects within the shell. The instrument is shaken to produce a sound.

How does the product function?

I have two ideas for possible products I can design.

The first product is an air gun. Similar to the Airzooka, the gun launches a ball of air using an elastic mechanism and a plastic film. An additional ring can be attached to the front of the barrel. The modular ring can be similar to the outtake of a Boeing 787 jet engine or the barrel of a gun. The end user can also create designs for the ring. The product demonstrates the conversion of kinetic energy to elastic energy to kinetic and sound energy.

The second product is a small box with a metal ball inside. The metal ball can be launched with a pinball machine ball launcher mechanism. There are a variety of obstacles within the box that can be hit by the ball to produce sound. The box is relatively flat and can almost be thought of as 2D. Due to chaos theory, the ball will travel in a different pattern each and every time.