Powering into Space

Forces are interactions between objects that cause a push or a pull between them. We can use pushes and pulls to move objects. For example, to walk outside I have to push on the ground with my feet. Similarly, if I want to catch a baseball in my glove, I have to exert a force to stop it. Otherwise, it flies right past me.

In last couple of centuries, humans have gotten much better at using forces to push things around. For example, we've learned how to make engines (motors) that provide push by converting the energy from gasoline into mechanical energy that pushes on the wheels of cars and trucks.

But getting something into outer space is a special challenge because it has to overcome the mighty force of gravity that tries to pull it back down again. Rockets can overcome this force because they are powered by controlled explosions that occur in the engine of the rocket.

An explosion is an extremely rapid chemical reaction that produces gases and heat. The force of the explosion is produced as liquid or solid particles are quickly converted into gases. These gases take up a great deal more space and as they expand they push out on their containers (the rocket). This push overcomes the force of gravity and propels the rocket into space.

In this activity, you will make a simple a "rocket" using a film canister for the rocket and Alka Seltzer and water for the fuel. Your mission is to determine what amount of Alka-Seltzer will produce the most efficient rocket.