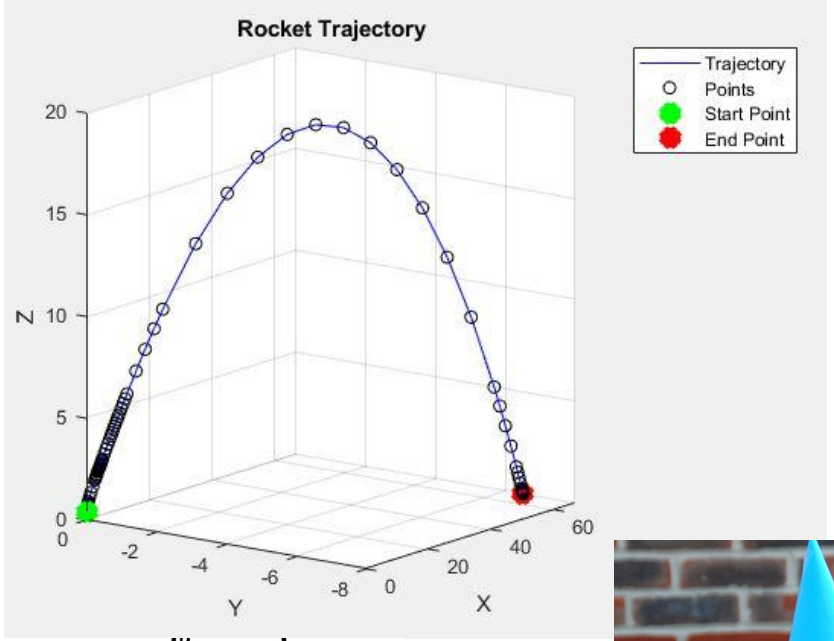
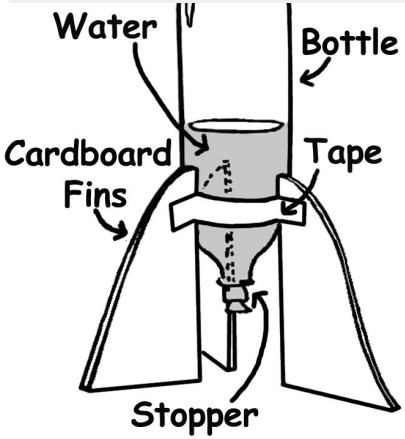
Option 1:

There are 3 periods in our bottle rocket over its flight path.

1. Water thrust period
    a. Water mass is expelled
2. Air thrust period
    a. Compressed air is expelled
3. Ballistic flight period

We have 2 phases of thrust where the pressurized fluids propel the rocket and provide the total energy to reach its peak. Ending with the rocket cruising through the air.



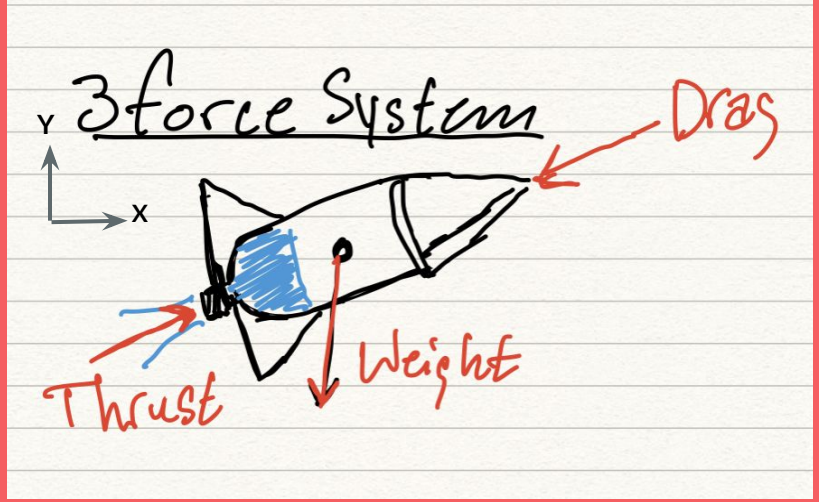


Option 2:

Looking in the X-Y plane, there are 3 forces that act through the system.

1. **Weight**
   a. Gravity's force from F=mg
2. **Thrust**
   a. From our pressurized liquid being expelled
3. **Drag**
   a. From the air resistance seen on the surface of the rocket

Forces must be balanced, preferably in the +X and +Y direction, to make a rocket blast off.



The trust force provides our upward movement, moving in the X and Y direction, while the drag force acts in the opposite direction.

The force gravity exerts on the rocket mass will always point down in the -Y direction.