Water Balloon Drop Lab

Scenario: You are on a planetary colonizing expedition. Your mission objective is to get the water balloon eggs to the surface of the planet without rupturing. However the engineers on Earth had used improper force units and you discover that the rocket does not have enough fuel to land on the planet without crashing. Your only option is to drop the water balloon eggs from the distance of the planetary orbit of your rocket ships. The gravity on the planet is such that a drop from your orbital distance is similar to a 12 meter drop on Earth. You must use only the material on your rocket ship and build 10 to 12 protective devices. To be viable, half of your water balloon eggs must survive the fall or you would have failed in your mission. Also of the half that survive, half must be female (red or yellow balloons) and half must be male (green or blue balloons). Since you are not sure of the atmospheric conditions of the planet, you do not know for sure a parachute will work. From the 10 to 12 different devices, you decide that 1/3rd should be a parachute design, 1/3rd should be a cushion only device, and 1/3rd should be a combination of a drag and cushion design.

Make a list of the available materials.

Brain storm four different designs.

1. Sketch your Parachute design and list the materials requested:

2. Sketch your cushion design and list the materials requested:

3. Sketch your combination drag and cushion design and list the materials requested:

4. Sketch your “outside the box thinking” design and list the materials requested:

Group Presentation: Each group makes a case for their design. The entire lab needs to decide on how the resources will be allocated (If a consensus cannot be reached, then the materials will just randomly be given out to each group by the instructor). The worst thing that can happen is one group takes more material than was required to complete the mission.

The Drop Procedure: One student will take the device to the 3rd floor of the S6 building, and the other student will be on the floor to clean up the fallen debris.

Final Assessment: State whether the overall goal was achieved. State which designs succeeded and the reasoning behind the success. State which designs failed and the reasoning behind the failure.