

The AntiNewton

By:
Justin
Charlie
and
Denise

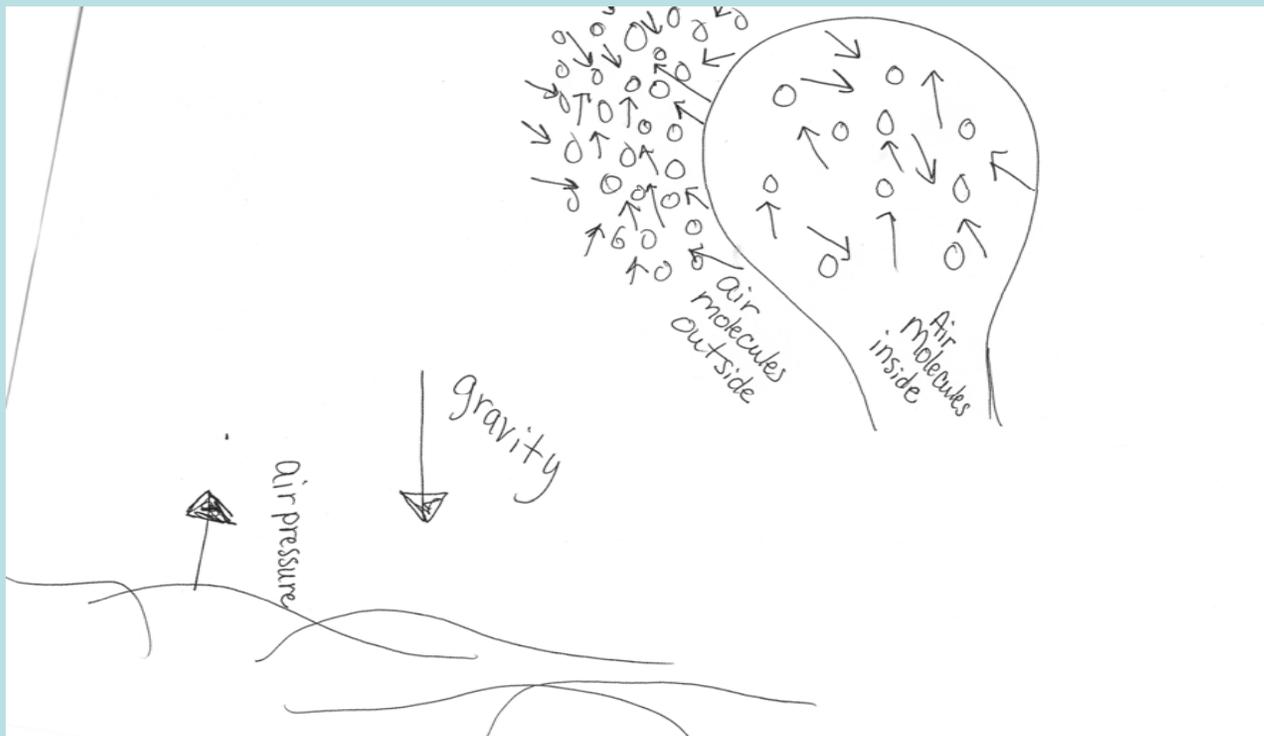
Copyright © 2010 Intel Corporation. All rights reserved. Adapted with permission. Intel, the Intel logo and the Intel Education Initiative are trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries.
*Other names and brands may be claimed as the property of others.

How It Works

- **Basically, you need less mass per volume inside the balloon than outside so that the air inside is less dense than the air outside which causes the balloon to lift. You have to do this while keeping air pressure the same inside as outside so the balloon won't get crushed by air pressure.**
- **A cubic foot of air weighs 28 grams, if you heat that air to 100 degrees Fahrenheit then it will weigh 7 grams less. Therefore, each cubic foot of air in a balloon can lift 7 grams.**
- **Buoyant force is equal to the weight of air displaced.**
- **The faster molecules collide and the stronger the force of impact, the more energy is transferred to an object. Therefore, when you heat the air, it increases the speed and force of the molecules transferring more energy. [Click here for more info.](#)**

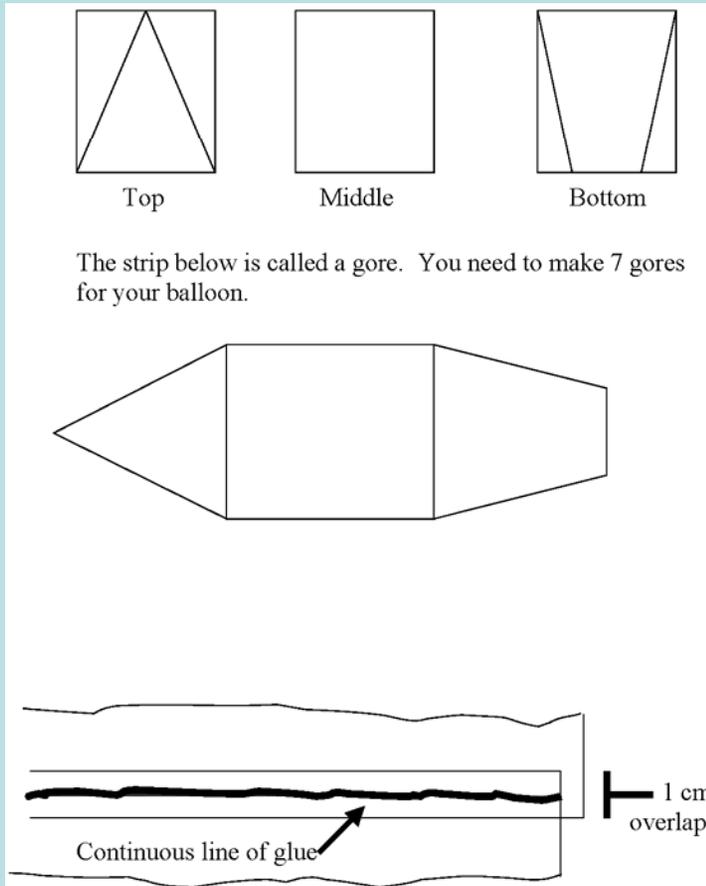


How Our Balloon Works



The Design and Rationale

Well, our balloon doesn't look quite like this,



but here's our diagram.
We chose it because it was simple and easy to use with our chosen materials.

Materials



Our heat source is a hair dryer



Two pound fishing line for the gores—strong and light weight



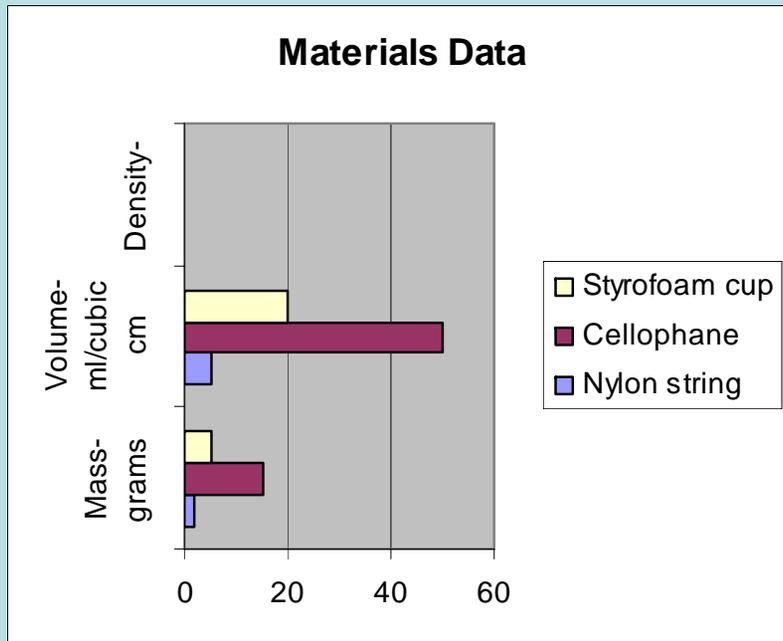
We designed our balloon out of cellophane—very light weight, yet strong



Styrofoam cup as the basket—not very dense, strong, and flexes

Materials Data

All our materials were also chosen for their fire resistance



Materials	Mass-grams	Volume-ml/cubic cm	Density
Nylon string	2	5	0.4
Cellophane	15	50	0.3
Styrofoam cup	5	20	0.25

Copyright © 2010 Intel Corporation. All rights reserved. Adapted with permission. Intel, the Intel logo and the Intel Education Initiative are trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries.

*Other names and brands may be claimed as the property of others.

The Flight

Temperature

Our balloon was first launched when the internal air temperature was 60 degrees Celsius and the outside air temperature was 30 degrees. Our balloon's flight time was 2 minutes and 4 seconds.

Launch



The next time we launched our balloon, the internal temperature was 70 degrees and the outside air temperature was 30 degrees. Our balloon's flight time was 2 minutes and 44 seconds.

Awesome!

Wind Direction and Speed

Reflection/Conclusions

Our balloon's performance was awesome! The one problem we had was keeping the air hot enough in the balloon envelope. Propane would have been better but we couldn't use it for this rally. Our landing was great. The basket flexed but didn't break.

Flight time



Landing

Comparative Analysis



Some balloons at the rally could not lift very well because the materials were too dense.

Many balloons could only fly less than one minute because the design would not allow enough hot air to stay in the envelope.

Note: we did not get spreadsheet done comparing 10 different balloons



Some of the baskets were made out of rigid material, which would not flex on landing—this could hurt some of the riders in the balloon.

The colder the outside air, the better the flight, since there is more of a difference in temperature from outside to inside. The morning classes had overall longer flight times.