

Bernoulli's Bag Experiment

This activity was created by Katy.

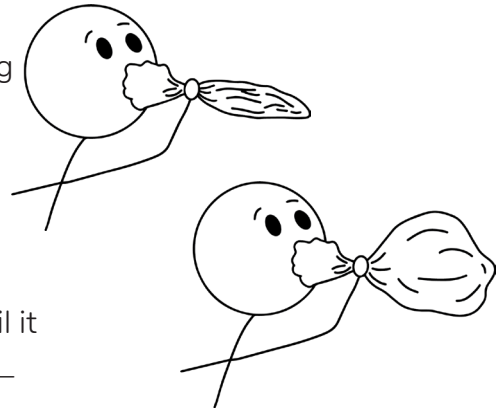
What is the most efficient way to inflate a plastic bag when you are blowing into it? Let's do an experiment testing two different methods to see which one works better!

Method #1

Step 1. Find a plastic bag. It can be either a grocery bag or a bread bag, but make sure there are no holes in it.

Step 2. Take a deep breath in, hold the bag right up to your face and blow into the bag inflating it as much as possible with just one breath

Step 3. Close the bag with your hand and continue to inflate the bag with the bag right against your face until it is full inflated. How many breaths did it take? _____

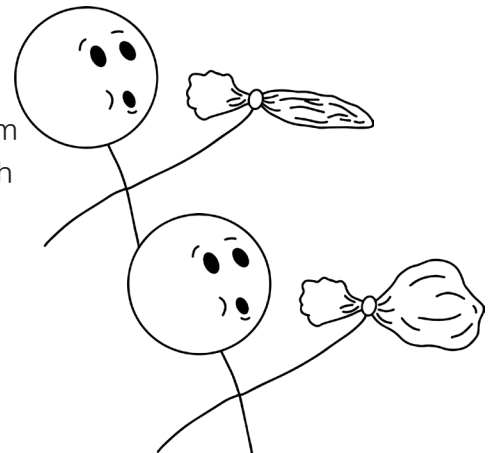


Method #2

Step 1. Use the same plastic bag as method # 1

Step 2. Take a deep breath in, hold the bag around 30cm from your face and blow into the bag inflating it as much as possible with just one breath

Step 3. Close the bag with your hand and continue to inflate the bag with the bag right against your face until it is fully inflated. How many breaths did it take? _____



Bernoulli's Principle

Why did Method # 2 inflate the bag so much faster? The explanation is Bernoulli's Principle! By holding the bag 30cm away from you face and blowing one big breath of air, you created a stream of air that is moving faster than the surrounding air. According to Bernoulli's Principle, the stream of faster moving air exerts less pressure than the surrounding air, therefore the surrounding air moves toward the stream made by your breath, wanting to go from high pressure to low pressure. The bag during Method # 2 quickly inflates because air from the atmosphere is drawn into the bag along with the stream of air from you lungs. This does not happen in Method #1 because the bag is around your mouth and blocks the surrounding air from entering the bag!

Try this experiment with different plastic bags and see what's the biggest bag you can inflate with just one breath.

Try challenging a friend or family member to see who can inflate a bag faster and watch them be amazed as you inflate your bag in just one breath!