

Walking on Air

The Science behind it!

When an individual puts his/her whole weight on one balloon, all of the pressure from that individual is concentrated on one small area of the balloon, which results in the balloon bursting.

When an individual's weight is distributed over several balloons, the balloons do not burst because the *pressure* is spread over a large area. As a result, each balloon only supports a small *fraction* of the weight.

This experiment only works if the balloons are not fully *inflated* (blown up). If this demonstration is done with fully inflated balloons, the rubber is already stretched out and is less elastic. Balloons that are only partially blown up still have the ability to stretch.



Now, we are going to experiment!

Consider the following key questions during the experiment:

- How many individuals can stand on the table without the balloons bursting?
- Why did we use partially inflated balloons?

Experiment: Describe the concept of weight and force distribution

Equipment:

Balloons	Table
	

Method

Safety

The following safety procedures are important to avoid panic and/or balloons accidentally popping:

- The table requires individuals to hold on to the sides at all times to provide support
- Keep order throughout demonstration
- Bring individuals onto the table one at a time

1. Blow up the balloons, but not fully (75%). It can help to blow the balloons up completely and then let air out until they are at 75% full



2. Get two individuals to place all of the balloons on the floor. Turn the table upside down and place on the balloons



3. Position one individual at either side to stabilise the table
4. Allow one individual to step onto the board (remind him not to jump or bounce on the table)



5. Continue adding individuals until the balloons start to burst
6. Discuss your findings of the experiment. Consider our questions: How many individuals can stand on the table without the balloons bursting? Why did we use partially inflated balloons?

Extension Activities

- Try reducing the number and/or placement of the balloons
- Try fully inflated balloons
- What would happen if the board wasn't there?
- Could an individual lie over the balloons without bursting them?