

EFFECTS OF AIR PRESSURE – REDUCED EXTERNAL PRESSURE

MED 16.13a



Material:

Item-no.	Qty.	Description
DM503-2A	1	Vacuum pump, electric 12, two stages
C1520-1M	1	Vacuum hose, plastics, D=6 mm, L=100 cm
DM520-2G	1	Bell jar 7 l
DM340-8B	1	Balloons, set
P1410-1K	1	Clamp for balloons

EFFECTS OF AIR PRESSURE – REDUCED EXTERNAL PRESSURE

MED 16.13a

Purpose

Visualization of the effect of air pressure inside a vessel by reducing the external pressure.

Balloon

Preparation

- blow up the balloon and seal it with the clamp
- place the balloon inside the bell jar
- seal the bell jar with the lid, the tap on the lid has to be open
- connect the bell jar to the vacuum pump with the silicone hose;
make sure that the hose is connected firmly

Experiment

Switch the pump on and observe the balloon;
once the balloon fills out the bell jar turn off the vacuum pump.



Attention

When the pump is switched off, the tap on the lid of the vessel must be closed immediately, otherwise the pump's oil will be sucked into the vacuum vessel!

Explanation

Initially the pressure in the balloon and the external pressure keep their balance.
As soon as the vacuum vessel is pumped empty the counter pressure on the outside becomes smaller and the balloon becomes larger.

EFFECTS OF AIR PRESSURE – REDUCED EXTERNAL PRESSURE

MED 16.13a

Chocolate marshmallow

Preparation

- a round filter (or a sheet of paper cut to size) is placed in the bottom of the recipient.
- place the chocolate marshmallow on this paper
- seal the bell jar with the lid, the tap on the lid has to be open
- connect the bell jar to the vacuum pump with the silicone hose;
make sure that the hose is connected firmly

Experiment

Switch the pump on and observe the chocolate marshmallow.

(If you have a camera with a paired data projector - use it now!)

Turn the pump off once the chocolate marshmallow does not expand further.



Attention

When the pump is switched off, the tap on the lid of the vessel must be closed immediately, otherwise the pump's oil will be sucked into the vacuum vessel!

Note

Allow the air to flow in slowly through the tap.

Compare the volume of the chocolate marshmallow before and after the experiment and you will see how much "air" you bought!

Additional experiments

Reversed bubble burster, wrinkled apple, beer glass with a lot of foam, etc.

Practical application

When a diver resurfaces there is also a reduction in the external pressure.

If this happens too quickly, blistering in the blood can occur with dangerous consequences.