

### The scenario

<b>Subject (field/title)</b>	<b>Air pressure / Balloons in a vacuum</b>
<b>Length of movie</b>	2:01
<b>Main Goals</b>	Analysis of changes in gas inertness due to changes in air pressure
<b>Detailed Goals</b>	
<b>Structure and description of the experiments</b>	
<b>1. Introduction</b>	Description: The change in volume of partially inflated balloons due to changes in air pressure is shown
<b>2. Main topic</b>	Description: Changes in gas volume due to changes in pressure
<b>Part 1</b>	
	<p><b>Tools:</b> Balloons, Vacuum bell, vacuum pump, manometer.</p> <p><b>Description:</b> Balloons inflated with a small amount of air are placed under a vacuum bell. We turn on the pump, resulting in the air being partially pumped out from under the vacuum bell and the pressure drops, which is visible on the pressure gauge. As the pressure under the bell is lowered, the volume of the balloons increases. The pump is turned off, and the valve is opened to equalise the pressure under the bell with the atmospheric pressure. As the pressure increases, the volume of the balloons can return to its initial state. The observed process is related to changes in air pressure around balloons partially filled with the same gas. By lowering the pressure under the bell, we increase the volume of the balloons so that the elastic interactions of the balloon shell and the interactions of the molecules on the outer surface of the balloon are balanced with the interactions of the molecules enclosed in the balloon on its inner surface.</p> <p><b>Questions:</b> Would balloons in a perfect vacuum also expand when the air is pumped out from under the bell? If the lampshade were very large, would the balloons expand indefinitely?</p> <p><b>Conclusions:</b> Due to changes in the external pressure, the pressure inside the balloons also changes, which leads to a change in their volume.</p>
<b>3. Summary and notes</b>	<p>During the experiment, you can pause the video and ask students for their opinion on how the balloons will behave under the shade</p> <p><b>Level:</b> primary school and high school</p>