

The scenario

Subject	Thermal properties of matter / Temperature and pressure
Length	3:39
Main goals	Get to know about adiabatic processes
Detailed goals	To understand that quick compression or decompression of gas will lead to adiabatic process, i.e. without heat exchange.
Structure and description of experiments:	
1. Introduction	Adiabatic process is one of four main type of gas changes. It requires no heat exchange – what can be achieved by perfectly insulating walls of the gas container or by simply so quick change of pressure that the heat will not be able to flow, even with conductive walls.
2. Main subject	Temperature and pressure
Experiments	Plastic bottle with a rubber stoper and valve has water vapour inside. We increase pressure by pumping air into the bottle. Then we remove the stoper with valve and let the air decompress. Without heat exchange air does work and its temperature decreases, what is clearly seen by water condensation. In a brass syringe with an acrylic stoper we put a small piece of cotton wool. In dark place we suddenly compress the air inside the syringe; it is so quick action that heat is not exchanged, even with brass walls of the syringe. The work done on the gas causes temperature rise – so high that the cotton wool gets fire.
3. Summary, evaluation and remarks	Level: secondary school