

## Thermal Expansion Soundtrack

This is the soundtrack for the Thermal Expansion video. It is keyed to the scene number.

Scene	Voice Track
1.	This video is part of a web-based package on the Thermal Expansion experiment. It introduces the apparatus that will be used to perform the experiment.
2.	Here is the apparatus for the Thermal Expansion experiment.  The rod whose coefficient of thermal expansion you will measure is mounted on the back. You will control the temperature of the rod by pumping heated water through it.
3.	Here is a rod like the one that is mounted on the apparatus. It is surrounded with insulation to help maintain it at a uniform temperature.  You will connect the hose from the pump here.  You will connect the hose that returns the water to the pump here.  This is the part of the rod that will be fixed to the frame of the apparatus.  There is a tab on the rod. You will measure the change in length of the rod by watching this tab change position as the rod is heated.
4	This part of the apparatus heats the water in the container and pumps it through the rod.  A hose from the heater/pump unit connects it to the left-hand side of the tube, so the water will flow through the tube.  The water exiting the rod goes back to the heater/pump unit via the hose connected to the right-hand side of the rod.  The heater/pump unit is controlled with this part of the apparatus.
5.	Here is the on/off switch for the heater/pump unit . The green light indicates that water is being pumped through the tube.  We control the heater with this control. The orange light indicates that the water is being heated.
6.	There is thermometer that measures the temperature of the water as it enters the rod.  Another thermometer measures the temperature of the water as it leaves the rod.  There is a travelling microscope, which will be used to measure the change of length of the rod as its temperature changes.
7.	There is a low power microscope, which you will use to watch the tab on the rod as the rod expands.  The microscope is mounted on a rod connected to a micrometer. As the micrometer is rotated the microscope moves left and right. By reading the micrometer you can determine how much the microscope moves.
8.	Now we are going to turn the apparatus around so we can see the way the rod is mounted more clearly.

9.	<p>After draining the water from the rod we can disconnect the hoses.</p> <p>The free end of the rod is held in place with a plastic guard.</p> <p>The fixed end of the rod is held in place with a mount on the frame of the apparatus.</p> <p>We can connect the other rod to be measured to the frame of the apparatus by reversing the process.</p>
10.	After mounting a new rod on the apparatus you will probably need to add water to the container.
11.	This completes the video introduction to the Thermal Expansion apparatus. There is still important information to learn on doing this experiment from the associated web page.