**YouTube Labdisc Movies**

|  |  |
| --- | --- |
| **Part One: “Candle Flame” In Lab** | |
| Text: | Visual: |
| **3 SECOND MUSICAL GRAPHIC INTRODUCTION** overlapping circles of Kids doing experiments (SEE [www.globisens.com](http://www.globisens.com)) then logo flies in | |
| Today we will use the Labdisc, the thermocouple temperature sensor and a candle to explore combustion… the chemical process in which a substance reacts with oxygen to produce heat. | Talk to camera and show candle, labdisc and thermocouple |
| So what do you think is the temperature of a candle flame? Is it the same in all parts of the candle?  The candle is divided into 3 zones. | Show the candle… light it and then stand it upright.  Then show Labdisc and connect the thermocouple to it. |
| Here it’s blue - where there’s complete combustion due to the richness of oxygen.  Next up is the orange area: Where combustion is incomplete, instead there’s a high concentration of carbon.  The yellow section is where the carbon can ignite to emit the full spectrum of light – producing most of the light coming from our candle. | Show the different zones |
| So which area do you expect to be hotter…?  Let’s setup the Labdisc and find out for ourselves.  We will take the thermocouple temperature sensor because it can measure up to 1200 degrees Celsius. | Talk to camera |
| We will connect it to the Labdisc and setup the Labdisc.  First we select the thermocouple sensor. Uncheck all other sensors.  We select 10 samples per second and we’ll take a total of 1000 samples | Setup on screen |
| Let’s begin; we will insert the thermocouple temperature sensor into the blue zone. After the temperature reading stabilizes we will move to the orange zone. And then to the yellow section. | Show measuring flame, split the screen and show the candle and thermocouple on one side and the graph builds up on the other side. |
| Here is the candle flame temperature recording.  You can clearly see the three different zones. It’s also obvious that each zone has a different temperature. Let’s see what the temperature is.  This is the blue zone it reached 677 degrees centigrade.  You think that’s hot, let’s see what happens in the orange zone.  The orange zone was at 816 degrees.  But the hottest place in the candle flame is the yellow zone with nearly 1000 degrees.  Well this is hot!  We can also annotate the graph and add the candle flame pictures, starting with the blue zone. Using a digital camera we can add a picture and continue with the orange and yellow zones.  Here we can clearly see that temperature rises as we go up the flame – with the highest temperature at the tip of the flame. | Show work on GlobiLab |
| For centuries, candles were the main source for light during nighttime. I wonder if they knew that it’s all because of temperature and carbon production | Talk to camera then... |
| **3 SECOND MUSICAL GRAPHIC CLOSING** overlapping circles of Kids doing experiments (SEE [www.globisens.com](http://www.globisens.com)) then logo flies in | |