



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) ChristyAnna F. Zimmerman	Project Number J0534
Project Title Oxygen Levels and Burn Time	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Question: How fast will different objects burn in different levels of oxygen? Will the objects burn faster with more oxygen? What is the effect of oxygen levels on burn time? Hypothesis: If the oxygen levels are increased, then the objects will burn faster and less will be left of them. When there is more oxygen, the fire will burn more. I also think that less of the material will be left after burning in higher levels of oxygen.</p> <p>Methods/Materials Materials: ~1)15 2x2 inch squares of 100% cotton, 100% acetate, 100% non-flammable polyester and paper ~2)15 1/2 x 1 1/4 inch pieces of wood ~3)glass jar with metal lid that has 2 holes drilled into it ~4)6 foot long piece of plastic tubing ~5)low pressure inflator adapter ~6)pressure reducing valve ~7)plastic tubing adapter ~8)3 scuba tanks, one with 21% oxygen, one with 28% oxygen and one with 35% oxygen ~9)set of scuba regulators ~10)lighter ~11)stopwatch Procedure: Begin pumping oxygen into jar. Place material in bottom of jar. Ignite the material and time how long it burns until it extinguishes itself. Perform 5 trials with each material in each level of oxygen.</p> <p>Results I found that paper burned fastest in all air levels. Some burn times increased but more of the material was being burned. The materials were able to burn faster and/or more due to the increased oxygen levels. Non-flammable polyester, which would not ignite in 21% oxygen, would ignite when the oxygen level was raised to unnaturally high levels. At 35% oxygen, everything was reduced to ashes. At 28%, some things were still recognizable. At 21% oxygen some materials barely burned and most of the object was left.</p> <p>Conclusions/Discussion When the oxygen level increased, for the most part, burning times decreased. The lowest average times for all the materials were in 35% oxygen. As I raised the oxygen level, things were able to burn more and burn faster. In 21%, the polyester only melted but once it got to 28% it burned and in 35%, it was barely recognizable. In part my hypothesis was correct but in 28% oxygen, most times were higher than in 21%. Overall, the higher the oxygen level is, the faster and more objects will burn.</p>	
Summary Statement The higher the oxygen level is, the faster and more objects will burn.	
Help Received	