



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

<b>Your Name</b> (List all student names if multiple authors.) <b>Genoa M. Fox</b>	<b>Science Fair Use Only</b>  <b>S0810</b>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>Could the Lead From Color Computer Monitors Be Leaching into Our Water from Landfills?</b>	<b>Division</b> _ Junior (6-8) <u>X</u> Senior (9-12)
<b>Preferred Category</b> (See page 5 for descriptions.) <b>8 - Environmental Engineering</b>	
<b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p><b>Objective:</b> My objective was to see if the lead in a Cathode Ray Tube from a color computer monitor could leach into our water system after being thrown into a landfill. I hypothesized that more lead would leach out under acidic conditions.</p> <p><b>Materials and Methods:</b> I took 50-gram glass samples from the face, funnel, and neck of a NCD 16 inch color computer monitor. Using a hammer, I crushed up each sample into fine particles and then sifted them through a wire mesh screen to obtain uniform size pieces that were no larger than 0.83mm. Then 5.00-gram samples of the glass were measured out into each one of nine Erlenmeyer flasks. I added 50 ml of a pH 3 buffer solution to three of the flasks, 50 ml of a pH 5 buffer solution to three more of the flasks and 50ml of a pH 7 buffer solution to the remaining three flasks. I had a control flask without the crushed glass for each of the three buffer solutions. I agitated the flasks on a rotary table at a speed of 5 for 56-75 hours. I filtered the samples using a 20-micron filter and then took the samples down to San Jose State University where I used an Atomic Absorption Spectrometer to measure the concentrations of lead in the samples.</p> <p><b>Results:</b> I found that the highest concentrations of lead were in the neck, and the most lead leached out in acidic conditions.</p> <p><b>Conclusion:</b> In conclusion, I found that more lead leached out of my CRT under acidic conditions. This is important because so many computer monitors and TVs are being dumped into unlined landfills everyday and are then being exposed to acidic leachate in the landfills and naturally acidic rain conditions. This is also important since acid rain is becoming an increasing concern and more monitors are being thrown out into landfills as better technology is released.</p>	
<b>Summary Statement</b> (In one sentence, state what your project is about.) My project is testing to see if pH has an effect on the amount of lead that will leach out of the glass component of a color CRT.	
<b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Teachers took pictures, proof read work, helped with typing, helped run test, referred me to others with more info. Used lab equipment at SJSU under the supervision of Dr. Terrill. Recieved broken computer monitor from Hai Teh at Micrometallics. Recieved instruction in statistical analysis from friend. Received some landfill info from Palo Alto waste management	