

Judge at Science Fair
St. Phillip's Middle School
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March 10, 2010

On March 10, 2010, I participated as a judge to a science fair at St Philip school in Pasadena. I met Beth Cohen, a science teacher, who was organizing the event. Several other scientists from Caltech, JPL and other institutions also volunteered and we formed one pair per class.

My partner -an astrophysicist from JPL- and I started looking at the students posters. Each poster described an experiment that tested a hypothesis formulated by the student. Most experiments were unique but a few students decided to study the effect of salinity and other physical parameters to rusting of nail. Some others investigated the effect of wind and surface area to rate of melting of ice. Overall the studies covered a large range of the hard and soft sciences, with a few experiments on psychology (influence of music on attention span and concentration, age control of physical abilities), botanics (the role of fertilizers on plant growth, effect of cooking seeds before planting), engineering (design optimization of baseball bats, golf ball, airplane wings) and physics (effect of temperature on water viscosity, temperature dependence of pressure).

We proceeded to listen to each students. Our motivation was to make the student feel comfortable and give him or her a chance to present the details of the experiment. We were very encouraging and showed interest by questioning the student further. I personally insisted on testing the reasoning of the student and clarifying the working hypothesis. At occasions, I had to correct a few statements, but I made sure to not criticize the work ever.

We were both particularly impressed by the work of two female students. One was describing how to crush soda can by the sole effect of depressurization with cooling. The experiment was very well designed, but what caught our attention was how well she understood and explained the underlying phenomenon. For example she was describing pressure as the cumulative effect of particules bouncing against each other the same way Feynman did. She was probably 11 years old. Another described an experiment she designed that showed the effect of temperature on water viscosity. She was timing a bolt going down a water-filled tube perhaps 2m long. In colder water, the bolt took an extra 5 seconds, on average. She was doing hydrodynamics, and she was perhaps 10 years old. The event was more formal than I imagined. There was a solemn protocol which, I imagine, helped the students deliver better organized presentation. Personally, I enjoyed participating in this event because it gave me an occasion to observe an American school.