



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

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Project Title Make Your Sweat Work Harder?	
Abstract Objectives/Goals Is it possible to cool your body down during exercise using chemical means? Through the application of chemicals to athletic garments, it is possible to make the sweat on the garment "work harder"? My hypothesis is that Xylitol, a sugar alcohol, is the most endothermic chemical of a set of: Sucrose/Glucose, Citric Acid, and Sodium Bicarbonate, because of its presence in mint flavored chewing gum, which usually has a "cooling feeling." In addition, Xylitol has a very low heat of solution of -36.5 cal/g, lower than any other chemical listed. With Xylitol's negative heat of solution, it becomes possible to have sweat absorb more body heat, effectively cooling the body faster. Methods/Materials The hypothesis was tested through a battery of 5 experiments. A key experiment included testing for the heat of solution of Xylitol using a calorimeter. A second key experiment included placing Xylitol treated textiles under a heat lamp, and monitoring its temperature over a period of time. Results Results showed the heat of solution of Xylitol to be -34.305 cal/g, in comparison to an actual heat of solution of -36.5cal/g. Application of Xylitol to garments offered a difference in temperature of up to 4 degrees Celsius. Conclusions/Discussion The application of Xylitol is an effective way to make sweat colder so that it can absorb more body heat. Problems lie in the heat of evaporation, effectively giving back any cooling effect that they Xylitol might have offered. Regardless, in areas where sweat is not evaporated, it offers a significant effect for the athlete. It leaves room for many promising applications.	
Summary Statement The project is about using Xylitol as an additive to textiles to improve the cooling effect of sweat.	
Help Received Used laboratory at Antex/Matchmaster textile mills. Had guidance from resident textile chemist	