

## An Opportunity for Elementary, Middle and High School Science Classes!

USI engineering students are inviting elementary, middle or high school science classes to join in an exciting project! The USI students and engineering faculty launched their second High Altitude Balloon last April and will launch another weather balloon with ten boxes of experiments attached to its tail on Saturday, April 24, 2010. The balloon typically bursts after about an hour, the experiment boxes parachute to the ground and the USI group will use a GPS locator to find and recover the boxes. **Three of the ten experiment boxes are being reserved for an elementary, middle or high school classroom to participate on a first-come, first served basis. If you're interested, read on!**

Teachers of classes that are selected to participate will be given an empty Styrofoam experiment box, at no cost, ready for flight. The teacher/students must commit to developing an experiment, putting it in the box and making certain the box with the enclosed experiment is delivered to the engineering department at USI by noon Friday, April 16<sup>th</sup>, a little over a week before the flight.

If you are interested in the students from one of your science classes participating, they will create their own experiment to be placed in the experiment box. Following recovery, the boxes will be returned to participating classrooms for post-flight analyses. Directions for participation:

1. Brainstorm and plan your experiment with your students. (Examples and resources for experiments are at end of this message.)
  - The experiment needs to fit in a 4.5" x 4.5" x 4" Styrofoam box that will be provided to you and the total weight of box and experiment must not exceed 1.2 lbs.
  - NO LIVE ANIMALS with exception of insects (bugs, spiders) may participate as part of an experiment.
2. Email USI Engineering faculty member, Glen Kissel your experiment idea, [gkissel@usi.edu](mailto:gkissel@usi.edu) by Monday, March 22, 2010. Three teachers/classes who contact Mr. Kissel with their plans by March 22<sup>nd</sup> will be invited to participate and arrangements will be made for the teachers to obtain the Styrofoam boxes.
3. Construct your experiment, place it into the box. Make arrangements to deliver the box to USI by Friday, April 16<sup>th</sup>, for the April 24<sup>th</sup> launch, or email Glenn Kissel at [gkissel@usi.edu](mailto:gkissel@usi.edu) by March 29<sup>th</sup>, if you need someone to pick up your experiment to deliver to USI. The USI students will document both the launch and recovery, and arrangements will be made to return the experiment box to you and your students, so that you can analyze the results.
4. You and your class should document the creation and analysis of your Balloon Assisted Stratospheric Experiment, so that the information can be shared with future participants. More details will be sent to participants as we get closer to the Launch date!
5. Students will be invited to observe the flight from Mission Control at USI on Saturday morning, April 24, 2010. If the launch occurs from the USI campus they will also be invited to observe the launch up close.

6. It may be possible for a USI faculty member or USI student to visit your class to give a PowerPoint and video presentation about our past balloon flights.

For experiment ideas and information about The High Altitude Balloon launch, you can visit the DePauw Balloon Assisted Stratospheric Experiments (BASE) Web site, as DePauw has participated in several launches: <http://www.depauw.edu/acad/physics/base/> . More information is also available at the Taylor University Web site <http://www.taylor.edu/academics/acaddepts/physics/balloon.shtml>.

Many of the experiment examples explained on these sites are appropriate for high school students, but the following message from Matthew Garver, Systems Engineer from Stratostar, includes experiment ideas for elementary and middle school students:

*In the past we have encouraged middle and grade school students to come up with almost anything they can think of such as sending up regular inorganic objects: pencil; stuffed animals; cell phones; keys; anything they would enjoy sending into space. As far as experiments go, they could send up marshmallows, bugs, and other things in which you can note the before- and after- differences. Depending on their understanding of physics and/or the atmosphere, you could walk them through a frozen teddy bear experiment, which basically has two temperature sensors and a stuffed teddy bear saturated with water at the time of the launch. Simply put, the temperatures both inside the saturated bear and outside are measured during the flight and the children have to think about how the data relates to what was really going on. Ultimately we would love to see the kids come up with something that has never been done before, so they can teach us something new.*

Finally, read comments from Nancy Mayer, 6<sup>th</sup> grade science teacher at St. Theresa School in Evansville, whose class participated in the fall USI balloon launch:

*My students came up with our experiment to place a small bag of pretzels and a bag of beans that had been vacuum packed into the experiment box. They were curious to know if the beans would explode. Due to the location of the launch site, we were unable to physically witness the launch. The engineering dept invited us to their Mission Control so most of my students brought their parents and watched the behind-the-scenes action. My students really enjoyed the experience. They thought it was cool that they could watch the engineering students track the location of the balloon and the staff was great and really took the time to explain things to the kids. I would recommend the experience to other teachers as a way of getting kids interested in science. I would forewarn teachers to realize that getting back their experiment boxes and the data can be a slow process (hurry up and wait), so be sure to prep the students accordingly. My students enjoyed using Google Earth to find different locations related to the launch.*