

Application for Approval of Outreach Event
Department of Chemistry, Oregon State University

App. # 14-01 <i>office use only</i>
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Instructions: Overtyping the non-emphasized plain text within the table cells with your question responses. After signing the declaration at the end of form, and appending relevant material safety data sheets (MSDS), present the hard-copy application file to either co-chair of the current safety committee. The application will be reviewed by the committee and department chair and either approved or denied within three working days.

ONCE APPROVED, THE NATURE OF THE EVENT MAY NOT ALTER SIGNIFICANTLY FROM THAT DESCRIBED HEREIN WITHOUT FURTHER REVIEW.

1. Name:	Sean Muir / Richard Nafshun	2. Date of event:	04-18-14
3. Contact information: muirs@onid.orst.edu, richard.nafshun@oregonstate.edu			
4. Provide a brief description of proposed outreach event:			
The proposed outreach event will be hosting 2 groups of 25 students from Linus Pauling Middle School in the Linus Pauling Science Center for materials science demonstrations and discussion of science careers.			
5. Where will event take place? and briefly describe nature of venue (capacity etc.):			
Linus Pauling Science Center, student street. The student street will be set up with 2 tables and should have more than enough capacity for accommodating a group of 25 students. The ventilation should also be adequate for the liquid nitrogen demonstrations being performed in the morning as well as the PVA+Borax activity in the afternoon.			
6. Describe make-up of intended audience/participants (number, age):			
2 groups of 25 students from the Linus Pauling Middle School 8 th grade geoscience class, approx 14 years of age.			
7. How will the event be supervised? Comment on ratio of participants to supervisors and the selection of volunteer supervisors (e.g. faculty, graduate students, SAACS members):			
1 middle school teacher (Pamela Toman). 2 parent chaperons per group of 25 students. Morning session (9:30-11am) will be run by Sean Muir and afternoon (11-12pm) by Richard Nafshun			
8. What training/instruction will volunteer supervisors receive prior to event?:			
No training for volunteer supervisors will be needed.			
9. List experiments/demonstrations to be performed:			
1) Variety of Liquid Nitrogen based demos: <ul style="list-style-type: none"> a. Superconductor magnetic levitation. 			

- b. Color changes of a light emitting diode.
- c. Expansion/contraction of air in a balloon with heating/cooling.

- 2) Demonstration of a thermoelectric module.
- 3) Demonstration of colored pigments.
- 4) Demonstration of a liquid crystal window.
- 5) Synthesis of Polyvinyl Alcohol with Borax "slime"

10. List all chemicals (& quantities) to be used (including solvents, cryogenes, and gases):

- 1) Liquid nitrogen (approx 2 L)
- 2) Polyvinyl Alcohol (approx 50 g)
- 3) Borax (approx. 50 g)

[obtain MSDS for each substance and collate in appendix at end of application]

11. How will chemicals be transported to/from event and how will waste materials be managed?:

- 1) Liquid nitrogen will be carried to and from in a cryogenic Dewar with vented lid from Gilbert Hall to LPSC.
- 2) Polyvinyl Alcohol and Borax will be transported in a plastic tub from Gilbert Hall to LPSC. Student will be allowed to take their "slime" with them in a ziplock bag. Remaining chemicals will be saved for future demonstrations and abandoned "slime" will be thrown away in the regular waste bins.

12. What protective equipment will participants (& demonstrators) be provided with?:

Students will all wear safety goggles provide by the demonstrator. Participants will need no further equipment for the PVA activity. The demonstrator for the liquid nitrogen demos will utilize protective eyewear and insulated gloves.

13. What provisions have been made for the possibility of accidents (fire, chemical spills, injury/illness etc.)?

LPSC student street is equipped with fire extinguishers and has direct access for emergency personnel in case of injury or illness. Spills from the PVA borax activity can be cleaned up with paper towel and water, which will be brought by the demonstrators.

14. Declaration: *I declare that the information provided above is accurate, that I have read and understood the implication of all relevant MSDS files, and that the nature of the event proposed will not alter significantly from that described.*

Signed:.....Sean W. Muir..... **Date:**.....04-15-14.....