

NCMN/Bright Lights 2015 Nanocamp

Monday

- **Soft Materials Robotics**
- **Nano Light Technology**
- **Magnetism**

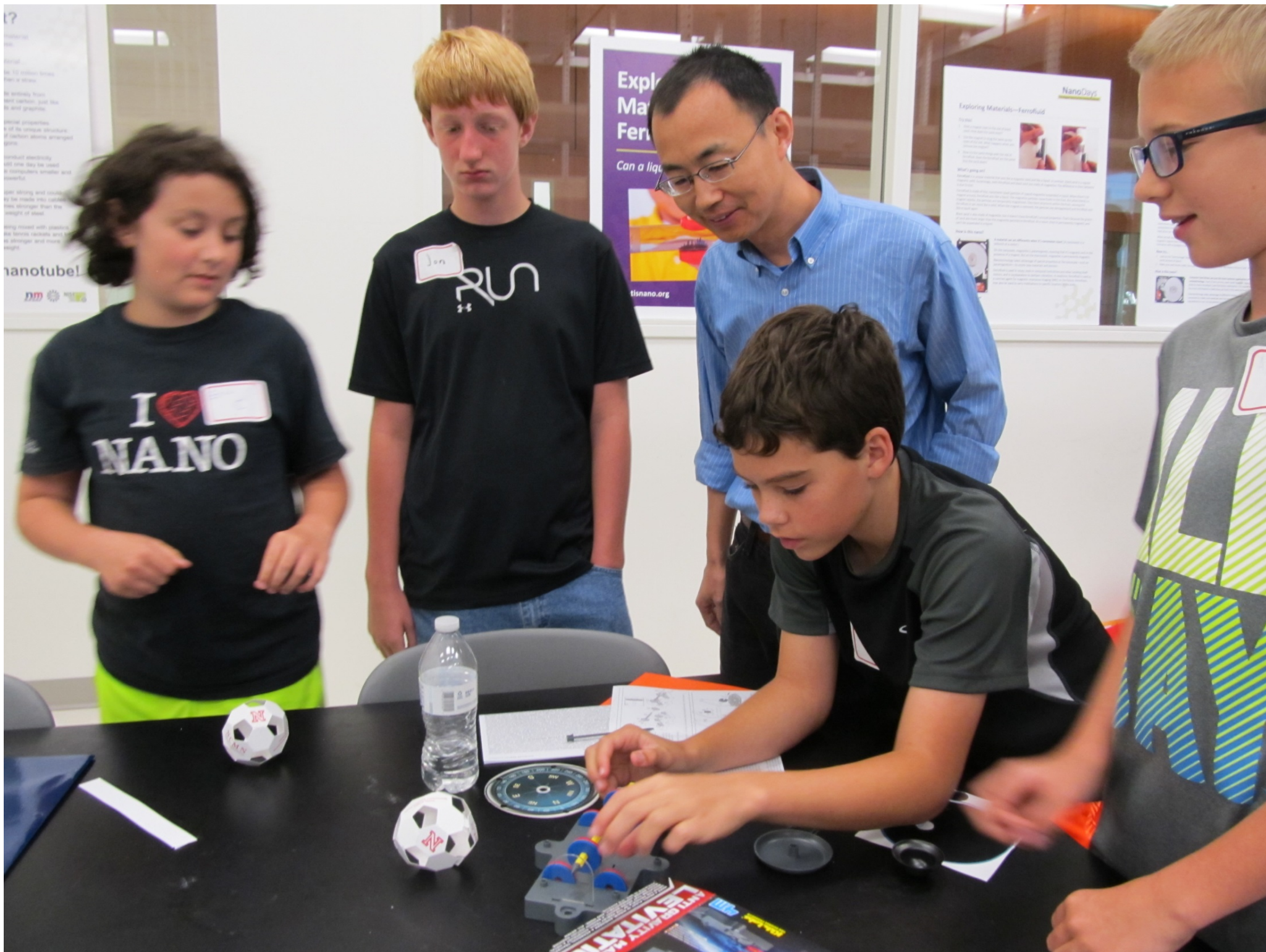












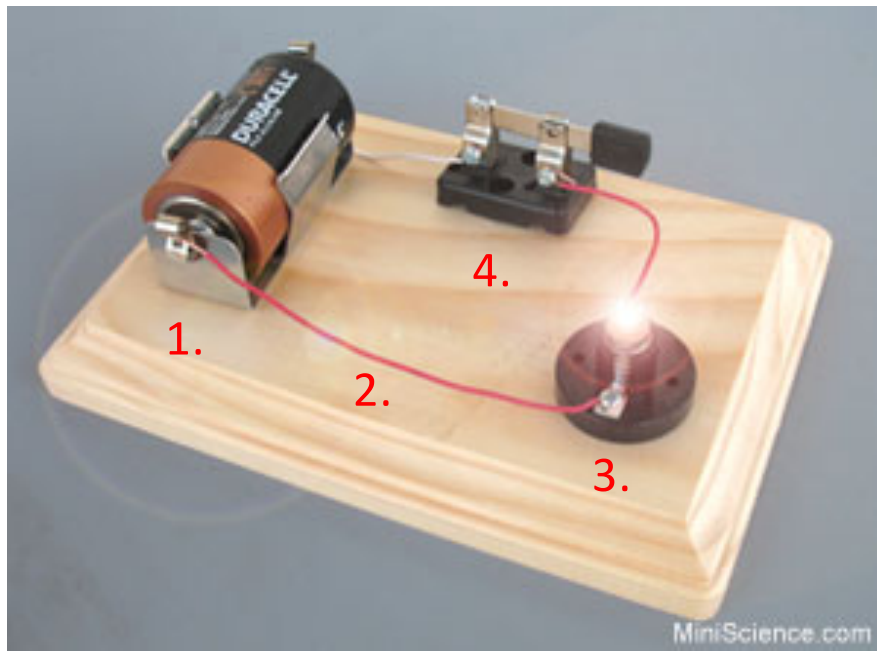


Tuesday

- **Electronic Circuits**
Squishy Circuits
Lemon Batteries

Basic Circuits

- What do you have to have for an Electrical Circuit?



1. Energy Source
2. Conducting path
3. Load (Resistance)
4. Switch (not needed, but usually present)

Let's make circuits



LEDs







What is it?

It's a very large model of a material that is too small to see.



This material...

...is a tube 10 million times smaller than a straw.

It is made entirely from the element carbon, just like diamonds and graphite.

It has special properties because of its unique structure: a tube of carbon atoms arranged in hexagons.

It can conduct electricity and could one day be used to make computers smaller and more powerful.

It is super strong and could one day be made into cables 100 times stronger than the same weight of steel.

It is being mixed with other materials to make stronger, lighter materials.

is a carbon

Exploring Materials - Ferrofluid

Exploring Materials - Ferrofluid

Index

- 1. Ferrofluid is a liquid that contains tiny iron particles.
- 2. It is used in many applications, such as in speakers and in the medical field.
- 3. It is a very interesting material to study.



What is ferrofluid?

Ferrofluid is a liquid that contains tiny iron particles. It is used in many applications, such as in speakers and in the medical field. It is a very interesting material to study.

How is it made?

Ferrofluid is made by mixing iron particles with a liquid. The iron particles are tiny, so they can be mixed with the liquid. The liquid is usually a oil or a water-based liquid.

What are its uses?

Ferrofluid is used in many applications, such as in speakers and in the medical field. It is a very interesting material to study.



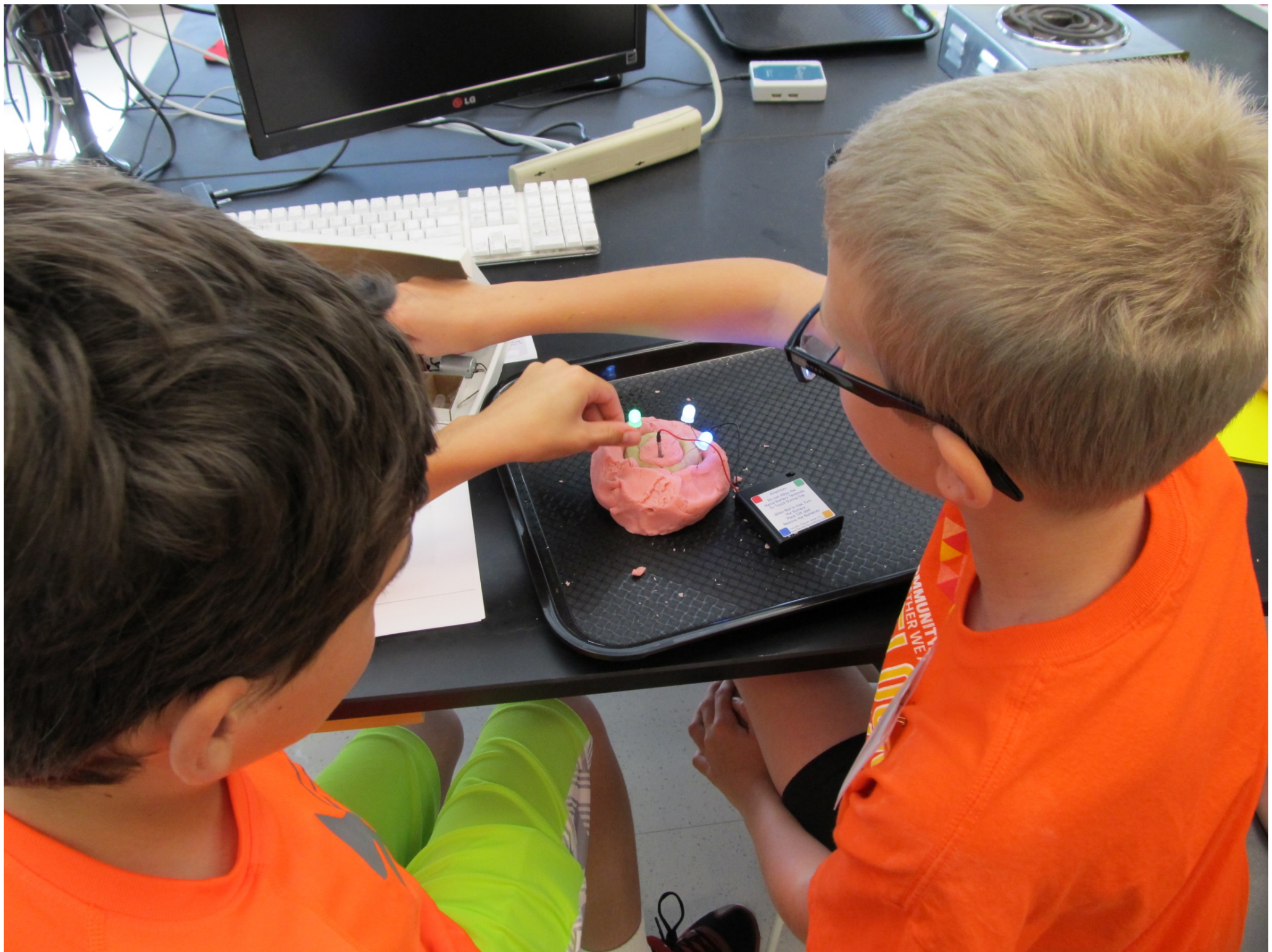




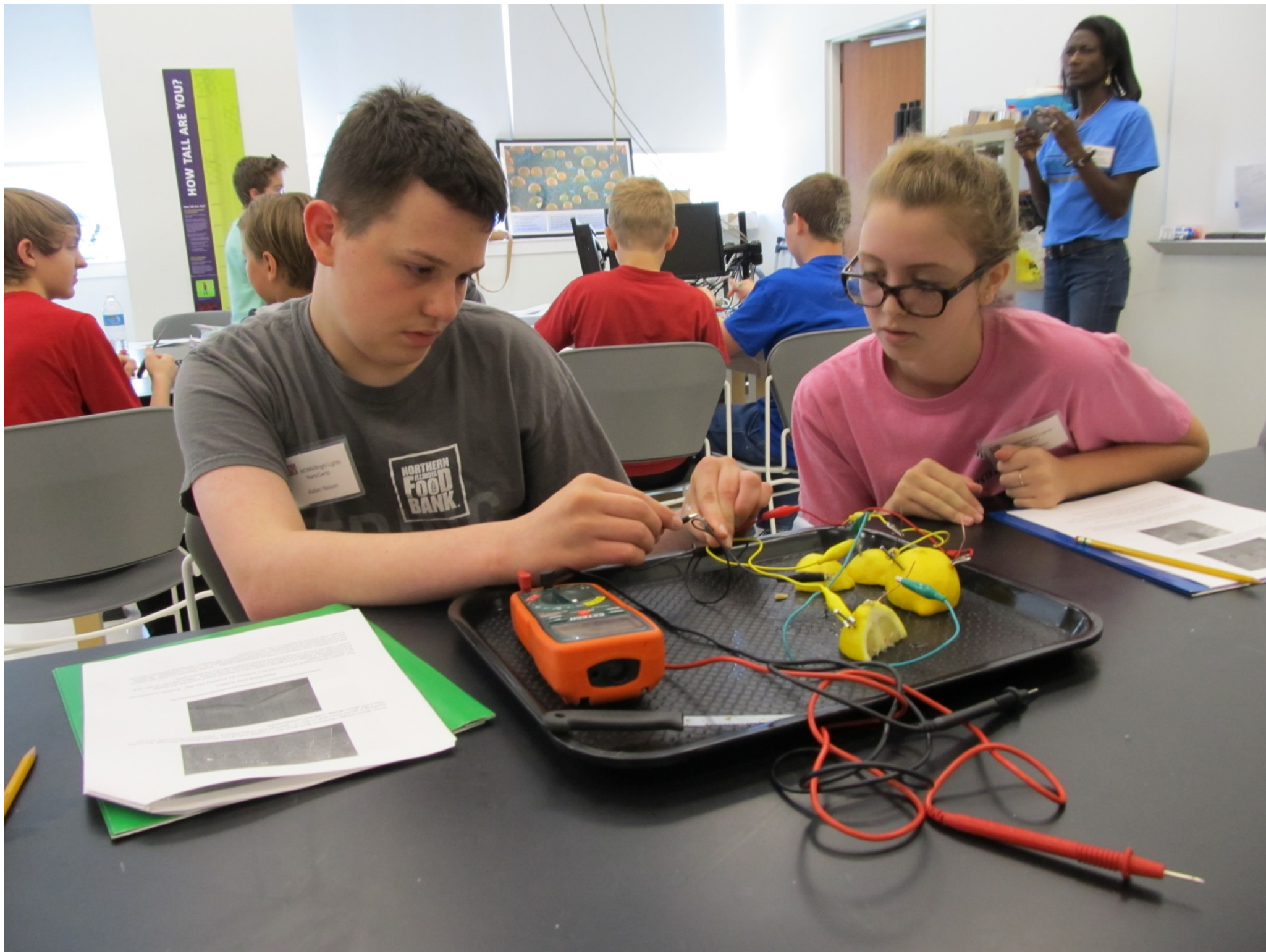


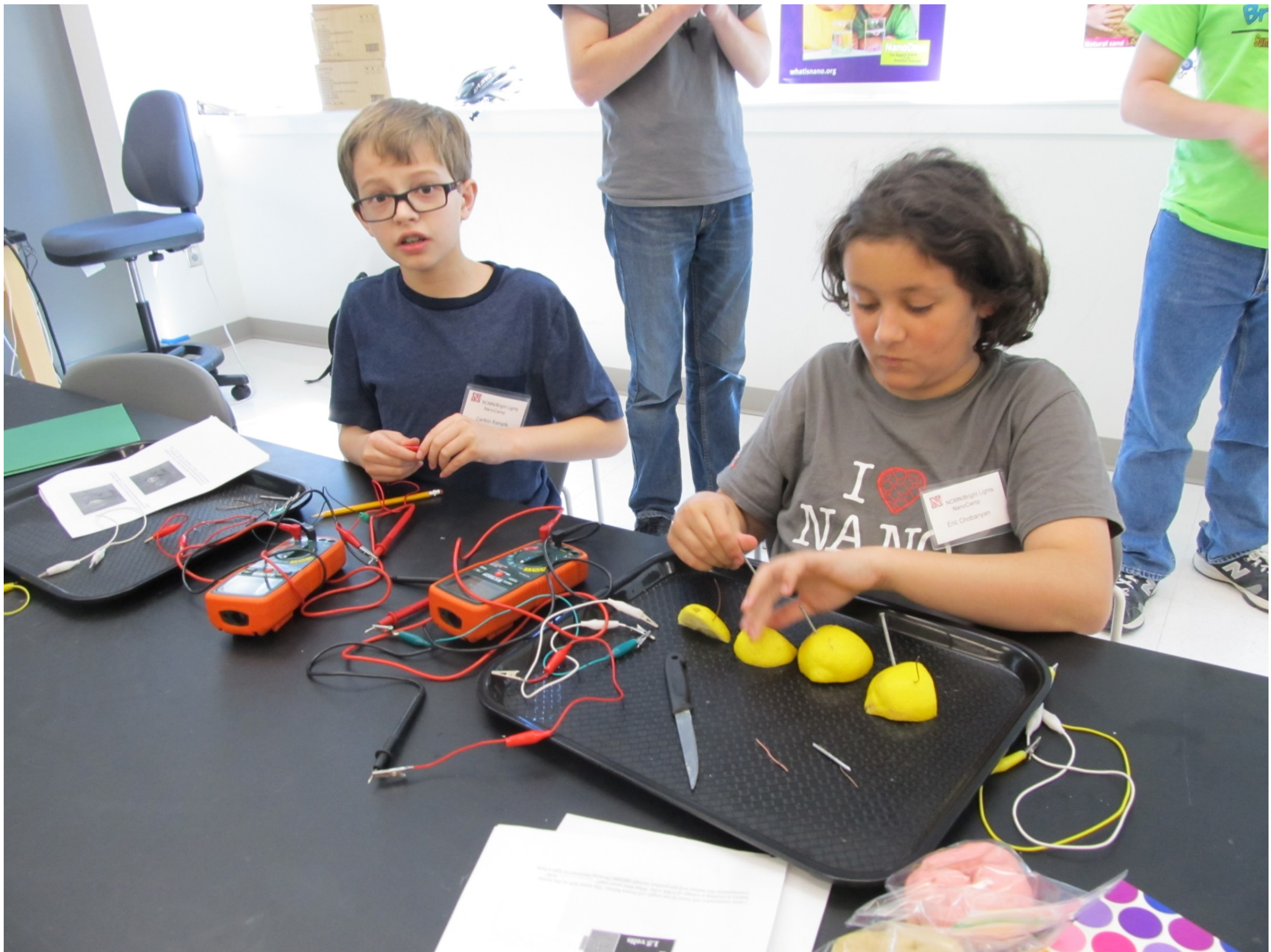














Wednesday

- **Hydrogels**
- **Nano and Environment**
- **Graphene**
- **Nano and Nature**







Would You Buy
That???

9:00-9:10am
Intro/ Ice breaker

9:10-9:50am
Hydrogels

9:50-10:20am
Environment

Break 10:20-10:30am

10:35-11:10am
Dr. Xia Hong G

11:10-11:20am
Name

Steve
Sewer

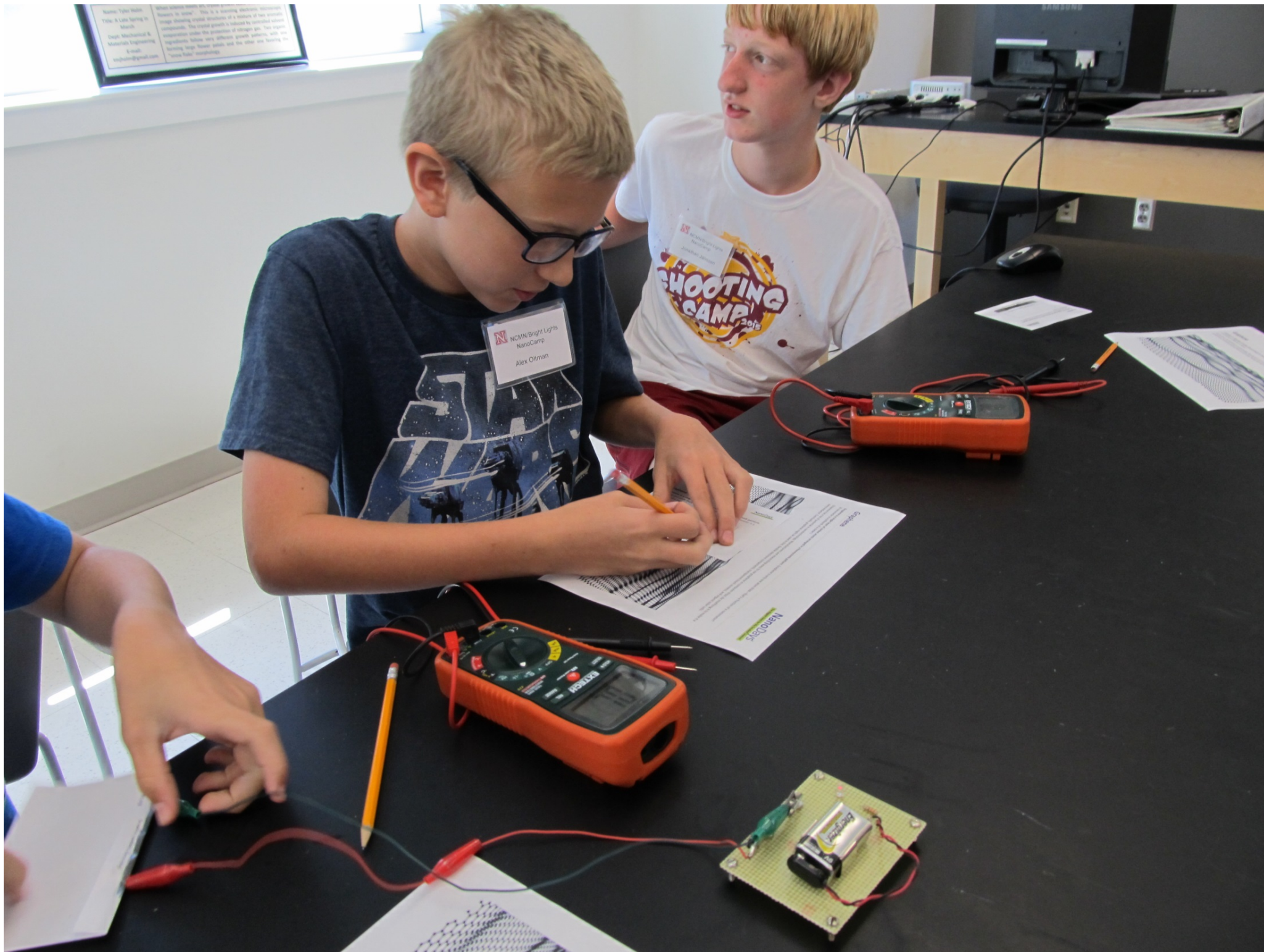
NORRIS
MIDDLE SCHOOL

THINK
ABOUT IT!

BUY
IT!

GIVE
SOMEONE ELSE MIGHT





Name: Tyler Huie
Title: A Line Spring in
March
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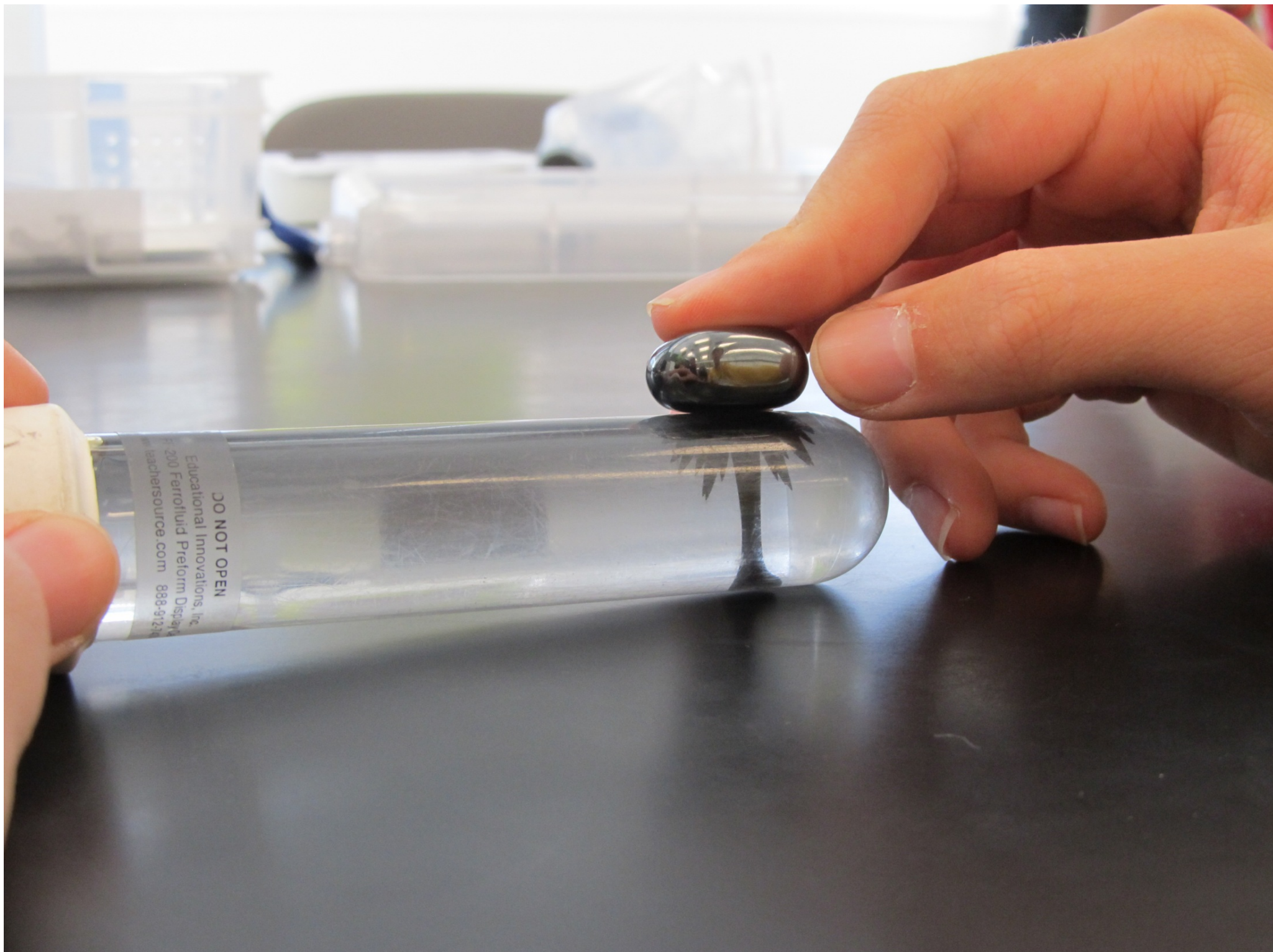
When silicon atoms are exposed to
fluorescence in water. This is a growing electronic technology
called photonic crystal structures of a mixture of two crystals
compounds. The crystal growth is induced by controlled silicon
nanoparticles under the emission of nitrogen gas. The silicon
nanoparticles follow very different growth patterns, with one
forming large flower petals and the other one forming the
"blossom" structures.





Thursday

- **Tour of Nanoscience Center**
- **Invisible Ink**
- **Nanocomposite Materials**
- **Carbon Nanotubes**





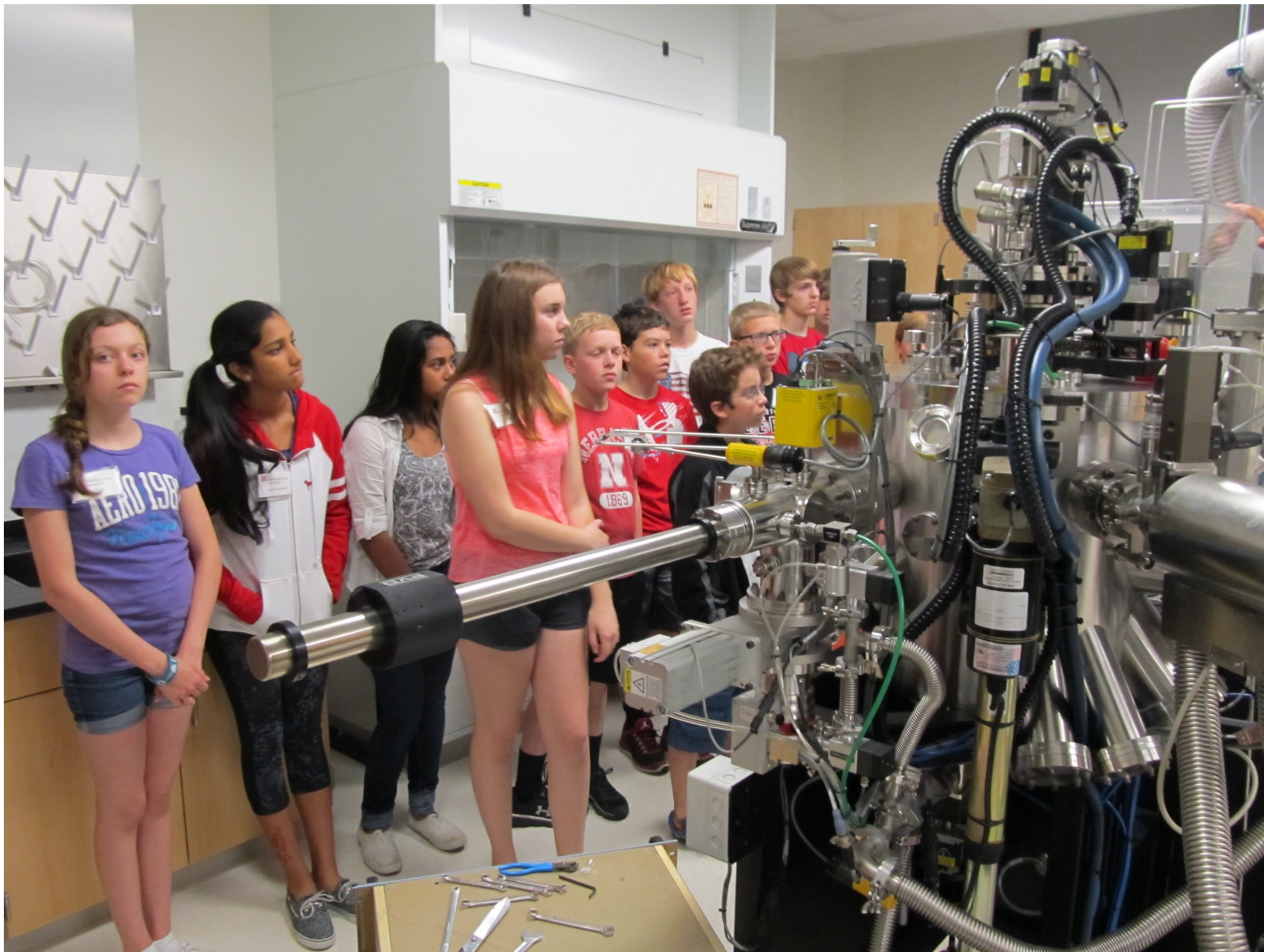
ASSOCIATE CONTAMINATION

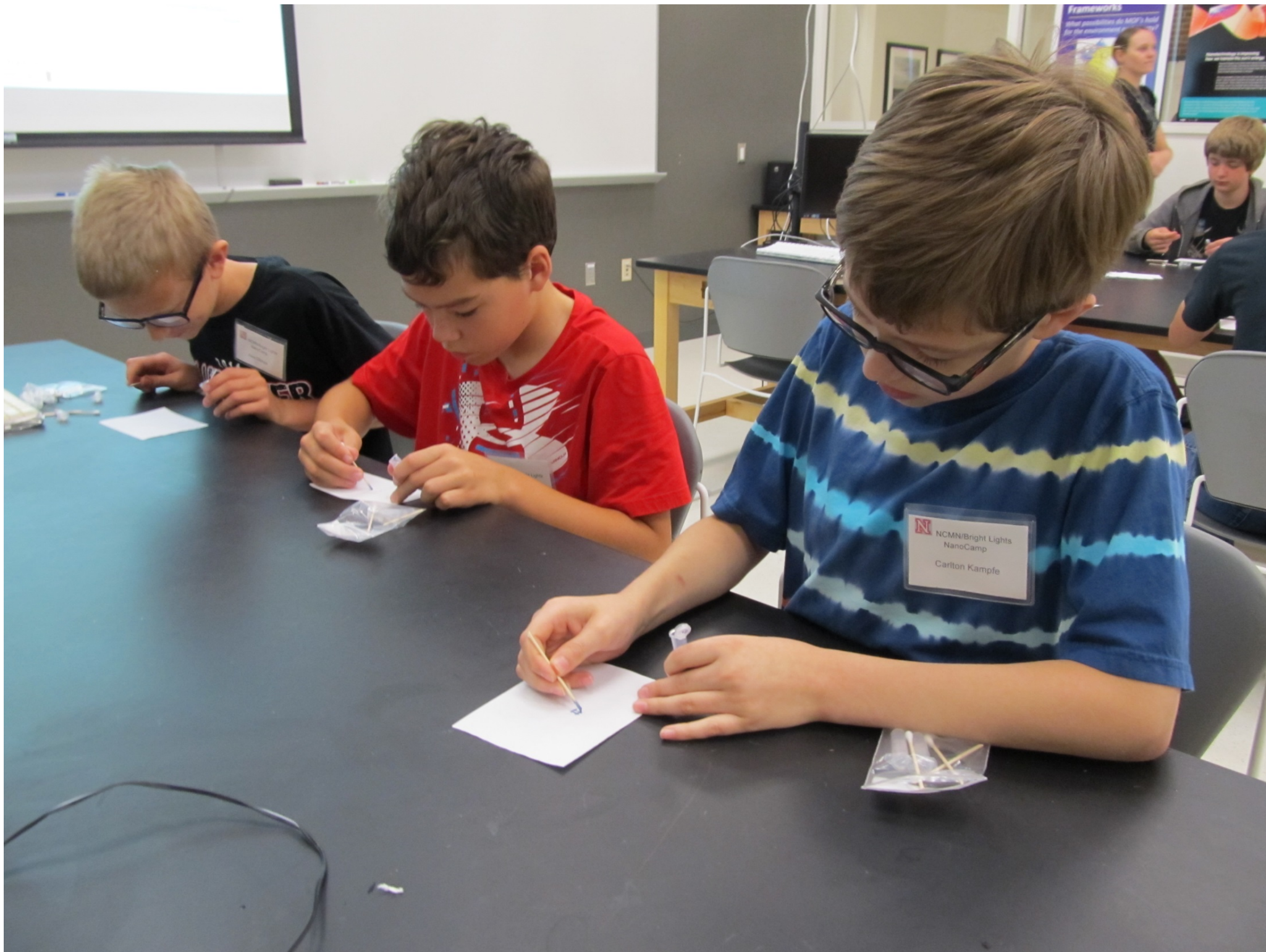
0.5 Micron Particles / Minute	Street Curb	Booth & Desk	Swirl & Heat
Sitting	302,000	132,000	7,450
Swinging Arms	2,380,000	500,000	18,700
Twisting Upper Body	850,000	267,000	12,300
Walking	2,920,000		

GOWNING PROCEDURES

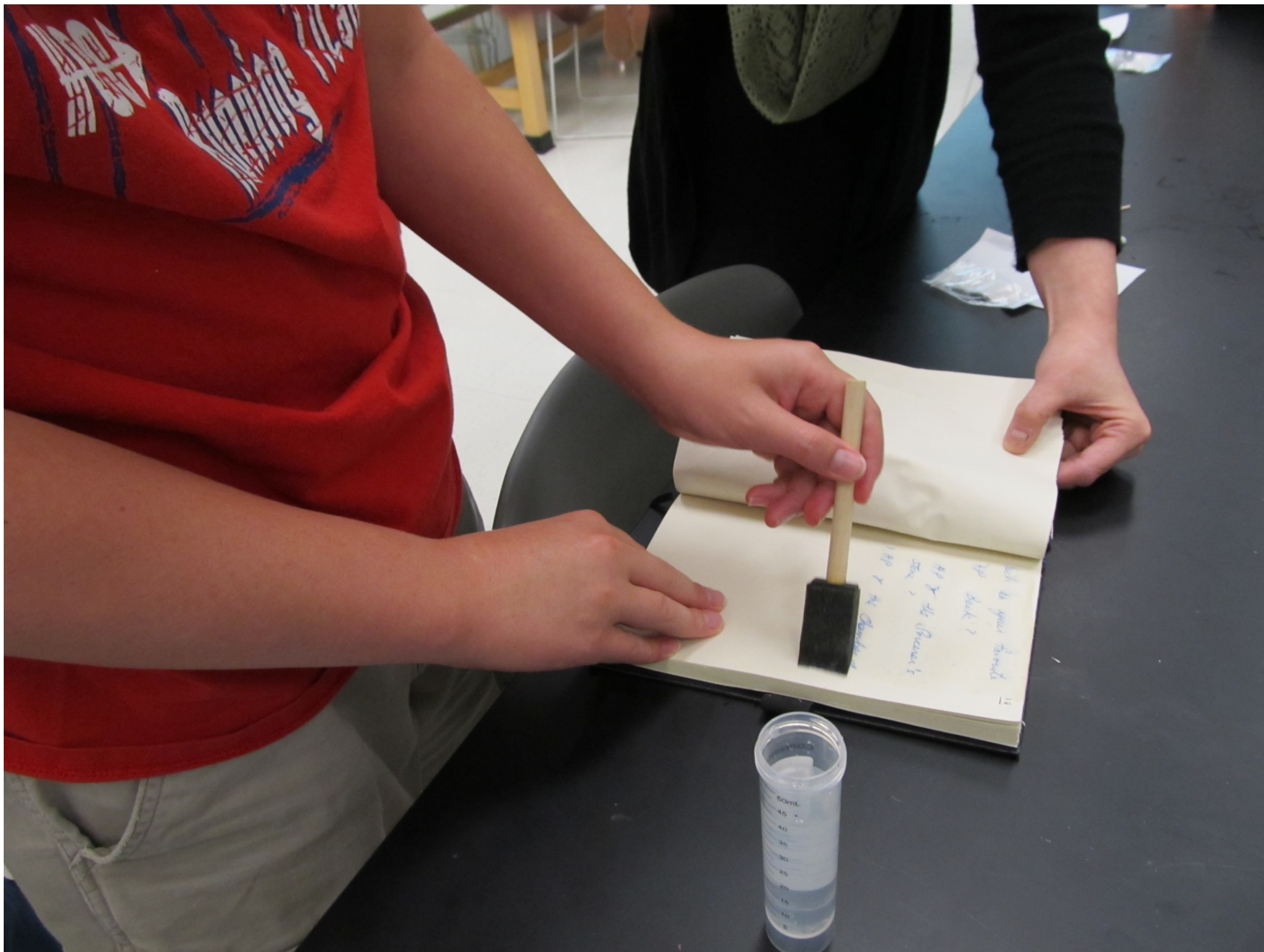
Gowning should be done from the head down. Darning the head first, prevents particles from the head, from falling on the garments.











uranium and thorium ores.
Need to integrate materials at use for wavelength
(different colors at different wavelengths)
Short wavelength (254 nm) long wavelength (365 nm)

Fluorite (CaF_2)
(Fluorescence)





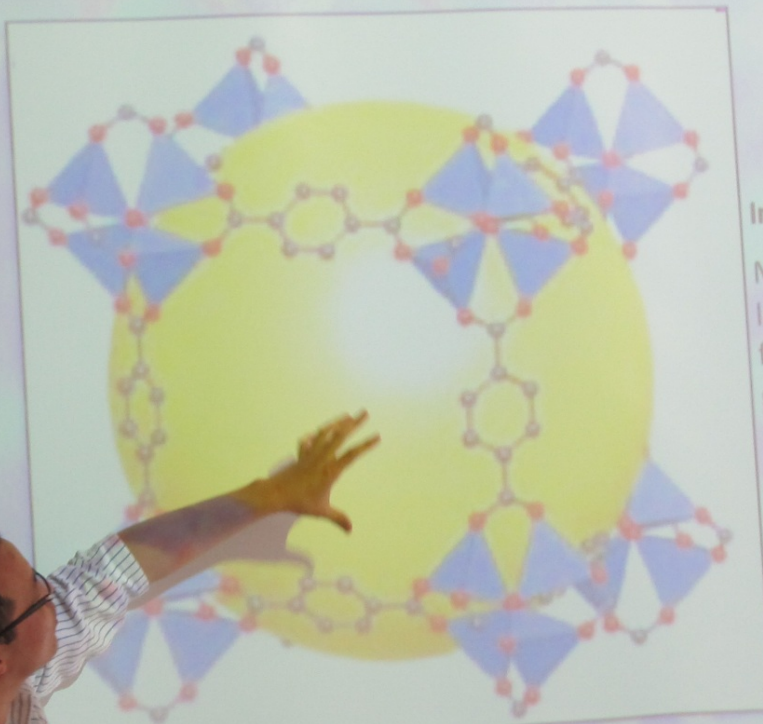




Friday

- **Metal Organic Frameworks**
- **Nano Ice Cream**
- **Open House**

Metal Organic Frameworks: MOFs



Inorganic-Organic hybrid materials

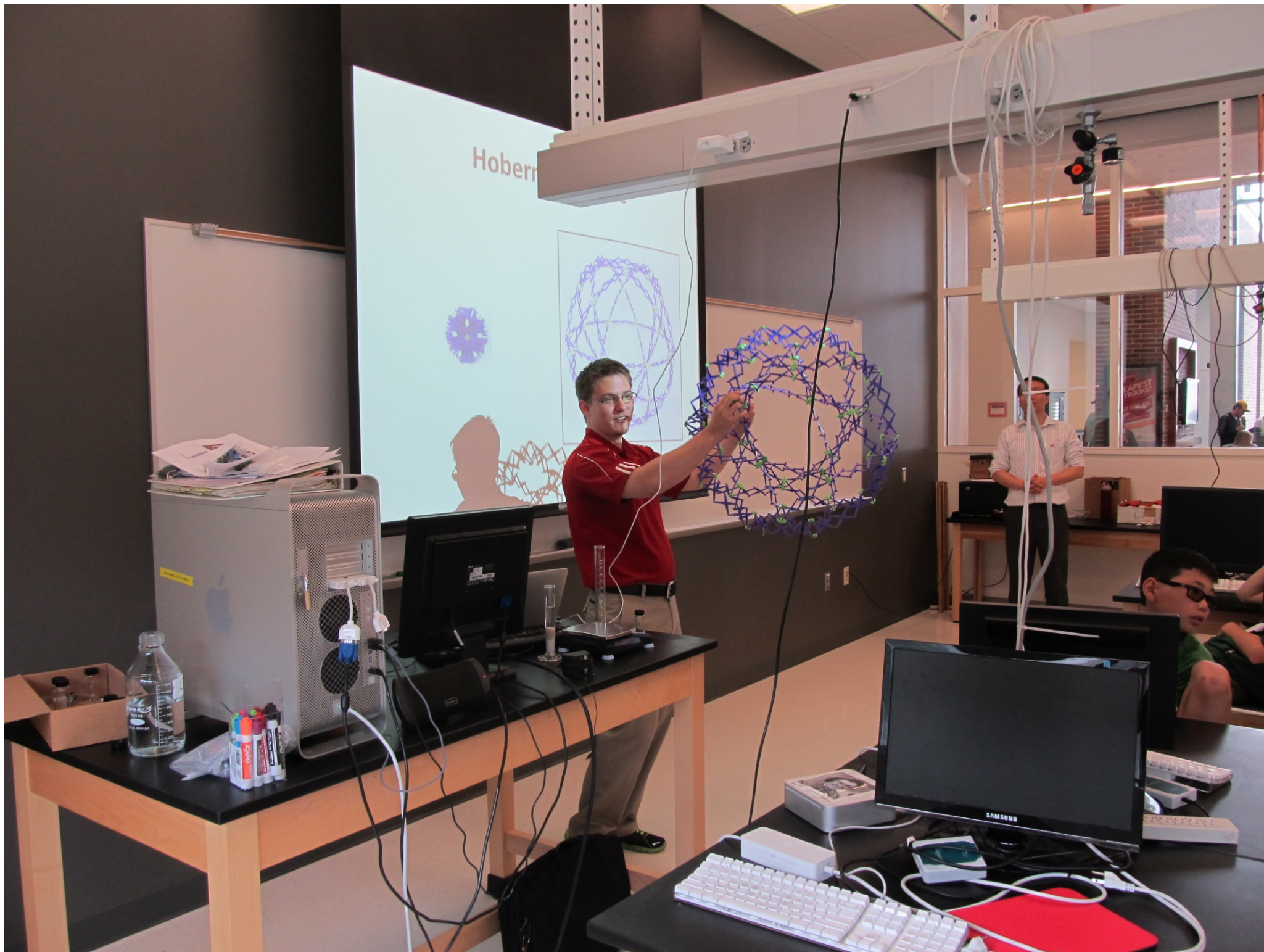
Metal nodes are joined by organic linkers, giving an extended 3D cubic framework with inter-connected pores of 11.2 Å aperture width and 18.5 Å pore (yellow sphere) diameter

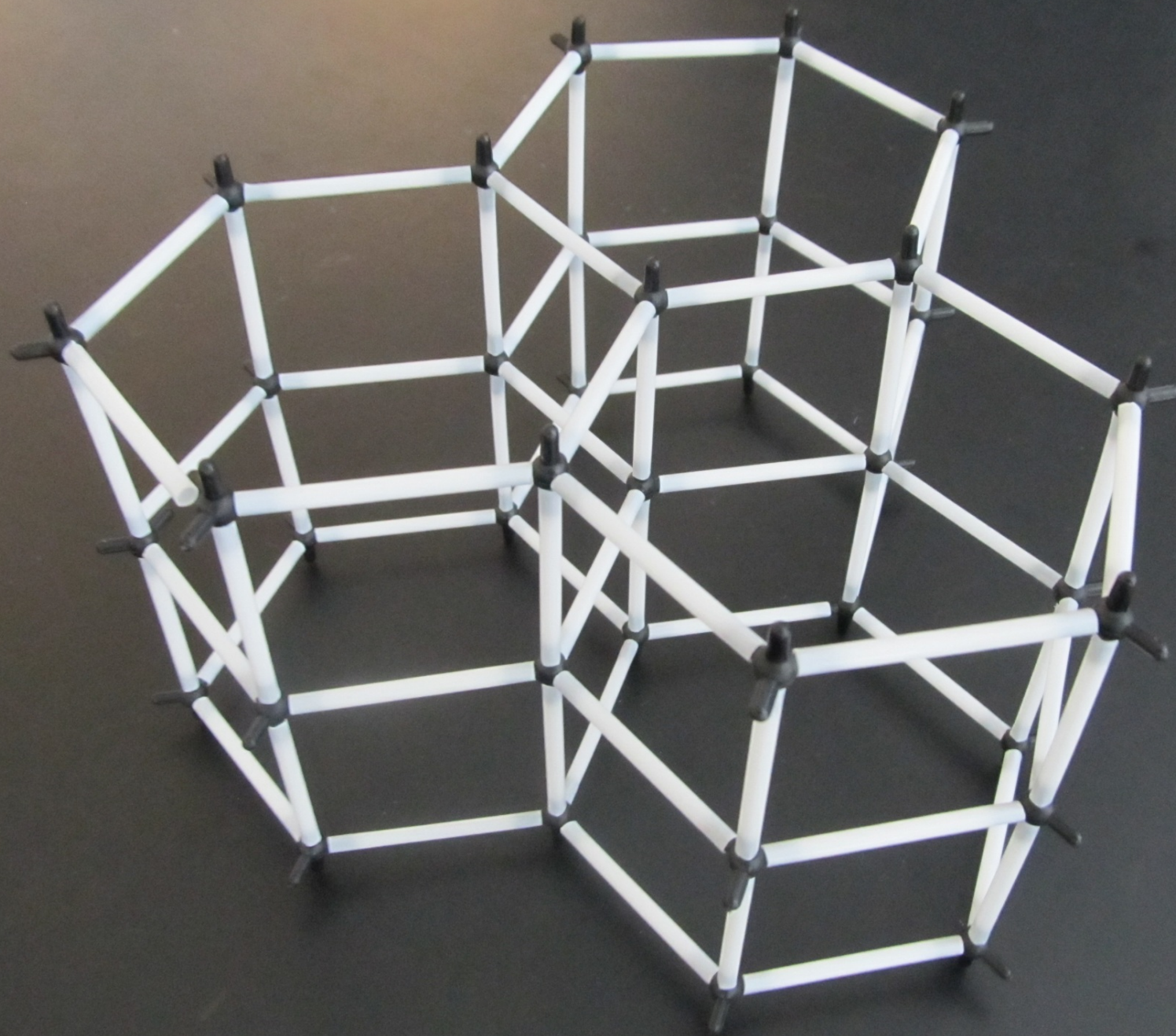
network
p

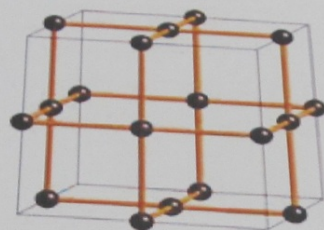
phene Rm 141

ymers 137





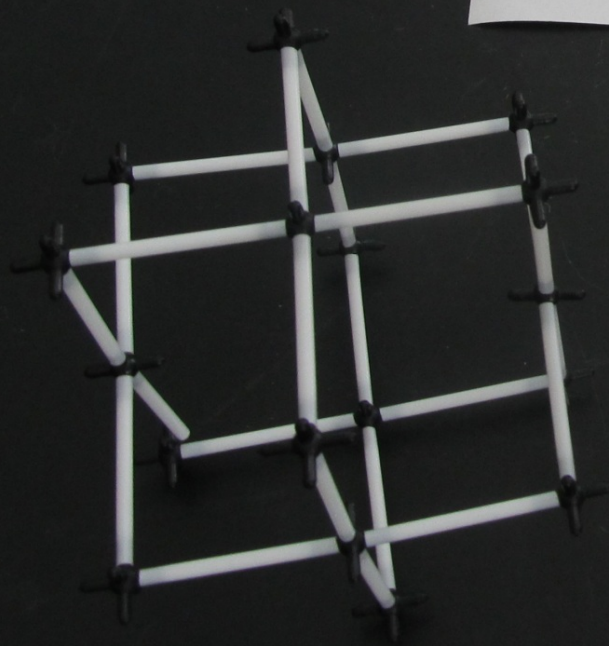
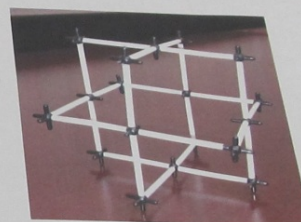




octahedral nodes used as square planar nodes
do not use



do not use



nano

Ice Cream



Nanocamp

June 20, 2013

Zane Gernhart









What is ice cream??

- It has ice in the name, is it a solid?
 - Not quite! See how it took the shape of
- Is it a liquid?
 - Not unless you wait too long
- **It's both!**



Colloids

- A colloid is one phase mixed into another.

COLLOID SYSTEMS		Continuous Phase		
		Solid	Liquid	Gas
Dispersed Phase	Solid	Solid 	Sol 	Smoke 
	Liquid	Gel 	Emulsion 	Fog 
	Gas	Solid foam 	Liquid foam 	(none)

- Ice cream is both a foam, emulsion, and sol!

