

Nano Summer Camp Outline (Example)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
Big Ideas covered	<p>Size and Scale</p> <p>Dominant Forces change with scale</p> <p>Where do we see it: The most efficient lab ever: NATURE</p> <p>Bio-mimetics</p> <p>Interdisciplinary Nature of Nanoscience.</p>	<p>Intro to lithography</p> <p>Gecko foot model</p> <p>TOP-Down Construction of materials</p> <p>Competing forces-with reference to gecko climbing</p> <p>Bottom-Up construction of materials</p>	<p>Tools and Imaging in the LAB, Lab tours</p> <p>--EM lab</p> <p>--Yang lab</p> <p>--Fearing Lab</p>	<p>Nano in Everyday life: Liquid Crystals</p> <p>Tools: AFM</p> <p>LBNL Tour</p>	<p>Nano and the Society: Societal and ethical Implications Forum</p> <p>Family, faculty and staff open house/poster session</p>
10-11	<p>Introduction and Camp Schedule</p> <p>Image sorter Game</p> <p>Talk about using lab notebook</p> <p>What is Nano?</p> <p>Why is nano special?</p> <p>Why is it happening now?</p> <p>How long has it been around and in what ways?</p> <p>Where do we see it: start into to Nano in Nature Start the question board. (ends by 10:45 AM)</p> <p>Size and Scale Activity</p>	<p>Continue discussion on Gecko Foot Glue, suction etc</p> <p>Brief discussion on math equation in a discussion format</p> <p>Show images</p> <p>Start the foot molding or soft lithography process</p>	<p>Intro to Lab tour</p> <p>Lab tours</p> <p>Electron Microscopy Lab (20 min)</p> <p>Fearing (Gecko and Robotics) Lab (10 min)</p> <p>Piedong Yang (Nanotubes and Nanostuructures) Lab (20 min)</p>	<p>Nano in everyday life:</p> <p>Liquid Crystals</p> <p>Can use example of magnets to explain self assembly, and changes to ordering when one magnet is affected. This is similar to LC ordering.</p> <p>Tools for imaging and manipulation: The AFM and the SPM</p>	<p>Wrap up for lbl tour</p> <p>Discussion group: nano and the society</p> <p>Ideas: Role playing, specific situations, nano silver socks and dietary supplement with nano particles. Ethical issues of using butterfly, gecko, cancer treatment etc.</p>

11-12	Properties that change with size: clay ball activity, changes in shape of water droplet, tiny tea cup (ends by 11:15 AM)	Intro to Nanotubes and Nanowires And Quantum dots: quick talk about QD, no demo Applications of NT and NW Nasturtium, self cleaning --Water droplet on leaf demo, Why is the lotus effect important (20 min total)	Lab tours contd	Discussion group: nano and the society contd
1-2	Super-hydrphobic surfaces Lab magic sand (30 Min)	Types of Lithography Bottom up and top down approach	Solar Cells LBNL Tour	Students work on their presentations
2-3	Presentation Babek Sanaii (LBL) on Photonic crystals in Nature BACKGROUND: Light , Energy, Wavelength, frequency,	E beam lithography and its importance in computing --start lab Continue photolithography lab Photolithography	Gecko foot tape testing and measurements LEGO setup LBNL Tour	Student presentation and student families Coffee and snacks provided

	Interference effects			
	The Butterfly Wing: - colors -Structure Vs Pigments -Wing activity with acetone -Optical microscope -Discuss SEM images of the wings			
3-4	Start discussion on the gecko foot --See the gecko Sticky tape activity	Photolithography contd	The afternoon will be split between studying the Gecko foot and the Solar Cells Activity	Finish LBNL Tour and return to lab Wrap up.
	Wrap up on the day, focus on what stood out for the students get feedback, what they thought was cool	Wrap up for the day	Wrap up for the day review lab tours	Student presentation with student families Coffee and snacks provided Wrap-Up
