

All About Light

Instructor: Laura Erlic

Description: This class will include hands-on explanations of light from the source of the sun and building models to represent the light hitting the Earth and making our daytime as well as providing heat and energy to our planet. Students will learn about Bioluminescence and the energy that all organisms have that can create energy that can even power light.

Outline:

Week 1 Night and Day Agilent Kit

Night & Day: Students use a model of the earth, spinning on its axis and changing its seasonal position relative to the sun. They will observe the cause and effect relationship that these movements have on our days and nights, our years, and our lives. Biomimicry: Look at how our earth and how our days are longer and how coral has recorded this time. Students will do an experiment to watch crystals grow like coral.

- <http://agatelady.blogspot.com/2012/02/length-of-our-day-is-getting-longer.html>
- <http://www.scientificamerican.com/article/earth-rotation-summer-solstic/e/>
- <https://www.youtube.com/watch?v=kJ9CN15h8SM>

Week 2 and 3 Functions of light - Light House Kit

The Lighthouse: Students build lamp assemblies and create their own lighthouses. From these houses, light rays emerge and are used for studying the behavior and properties of light. Student experiments include reflection, refraction, and the convergence of their light rays. Biomimicry: We will look at how nature uses light to enhance colors and how that might relate to color enhancements related to photonics and cellphones

- <http://www.asknature.org/strategy/70004833839cb8937d4d98963ffdf5#.VAOiJb-9Kco>
- <https://www.youtube.com/watch?v=N19ivyaQ5Mc>

Week 4: Bioluminescent Bacteria: Students will have started a 3 month experiment with foxfire fungi and will learn about different organisms that bioluminate. Learn about mushrooms and their root system and how mushrooms are taking over for plastic in the packing industry. I hope to also grow mushroom lamp shade for a light and skype with the designer. (TBD) Some helpful sites

- <http://materiability.com/living-light/>
- <https://www.youtube.com/watch?v=3iMC7kDL45U>
- <http://www.aol.com/article/2016/03/08/this-start-up-plans-to-use-bioluminescent-bacteria-taken-from-se/21324722/>

- <http://www.glowee.eu>

Week 4 How do we use those Functions of light - Periscope Kit

Periscopes: This activity introduces the students to the basic properties of reflection. They experiment with mirrors, reflecting geometric shapes and symmetrical words and images. The session continues with each student constructing their own periscope and having a great time finding ways to apply the tool. **Biomimicry:** Focus will be on lobster eyes and their geometric eyes and how light is reflected.

<http://www.asknature.org/strategy/doaa323a6a8911e898b9a714c51c49b7#.VAhtPChAGKs>

Week 5 Solar Energy - Solar ovens cook pizzas and solar energy

Solar Energy: The earth has many sources of energy. From renewable sources like the sun and the wind...to non-renewable ones like coal and oil, the earth provides for our need of energy to warm our homes, power our factories, and keep our cars moving. In this unit students will explore the energy provided by the sun.

Week 6 & 7 Raspberry solar energy

Biomimicry, other alternative energy sources. Students will create a solar cell that illustrates energy conversion principles using biology, chemistry and physics. Students will look at photosynthesis process and relate it to the solar cells. We will also look at what we can do at home with our living wise kits and take home a kit to help our family with living wise.

Rubric:

30% Attendance

30% Participation

40% Completion and understanding of weekly work

