



THE FACULTY CORNER

A WORD FROM THE ANACAPA SCHOOL SCIENCE DEPARTMENT. . .

This year, my science classes are all about life! What is life and, more importantly, what makes life work? There is magic in the machinery of living things, and we have spent the first semester exploring the many synergistic pieces that come together to make humans, and all other life, work.

UPPER SCHOOL BIOLOGY

The Upper School has spent the first semester on the inner workings of life. We studied the crucial chemical compounds that encode life's many functions, such as DNA and the unsung hero, proteins. We examined cells, which utilize chemistry to create mysterious microcosms in themselves, complete with protein-driven, alien creatures called cell organelles, working together like an elaborate Rube Goldberg contraption. We explored the chemical drivers of the processes of photosynthesis and respiration, key to the production and utilization of energy, which ultimately rely on—you guessed it—proteins.

We ended the first semester with a discussion of genetics, including the emerging field of epigenetics—the study of how genes are regulated by our environment and the timeless question of nature versus nurture. (And, yes, our genes are related to proteins.)

As a class, we crafted scientifically accurate comic books, used the principles of experimental design to make eggs gross and to study osmosis at the same time, and discovered that counting onion cells under a microscope can make you dizzy. In the coming semester, we will move beyond the inner workings and explore larger trends, such as evolution and the types of life in the world. Students can look forward to comparative dissections of organisms, such as frogs, as well as a continued focus on experimental design as we explore the visible world of life.

LOWER SCHOOL LIFE SCIENCE

The Lower School has also been exploring the many small phenomena that add up to life, from chemistry of life to evolution, with an emphasis on lab techniques and lab work. Lower School students watched diffusion at work in potatoes, extracted DNA from strawberries, used Mendelian genetics to create monsters, and designed birds to be successful in environments ranging from the Anacapa School, to a salt marsh, to a zombie apocalypse. They observed cell division in onions, used microscopes to grasp the variety of life that exists that we can't even see, and casted our own fossils. Lower School students can now properly utilize common lab materials, such as balances and graduated cylinders, and they are beginning to grasp the many considerations that go into designing a reliable experiment.

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During the second semester, Lower School students can look forward to big things—things we can see. Students will perform a dissection, to better understand the organization within living organisms, and will examine the larger dynamics at play in ecosystems—a foundational exploration of ecology.

Overall, it's been a great start to the year in science, and there is a lot more to study, explore, and discover in the second semester! I encourage students and parents to keep an eye on the news for bio-related breakthroughs (of which there are many) and share them with family, friends, and, of course, their science teacher. As always, if there are any questions or comments or if you have a great idea for connecting biology to our lives, please feel free to contact me.

~ ~ **Megan Nesland**

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Office hours: Wednesday 3:30-5 pm, Thursday at Lunch, Other Times by Appointment

UPPER SCHOOL PHYSICS

How much does the earth weigh, or more exactly, how much mass does it have? How can we possibly answer such a question? Where is a scale big enough to weigh the earth? Isn't the earth floating in space, anyway? Even if you did have a big enough scale, how would you use it to "weigh" the earth? It seems impossible to do.

And what about the moon? What's the moon doing up there anyway? What holds it up? Why doesn't it fall out of the sky? And if it is falling, how fast is it falling? What's going on?

We've addressed these questions—and more—in our first semester Physics class, and we calculated quite a few answers. Turns out, thanks to Sir Isaac Newton, you can "weigh" the earth and calculate rather precisely what the mass is of our floating planet. And what the moon is doing up there.

You can, by the way, thanks to Albert Einstein, also figure out how much less your twin brother Isaac will age if he travels through space at close to the speed of light, while you, Esai, get to stay here cleaning your room.

We studied these and other topics in Physics during the first semester. It's not a class for the faint-hearted, but worth the effort.

~ ~ **John Luca**

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Office hours: Morning Nutrition Breaks and By Appointment