



## Lion Science & Language 2: Biology

Why do we do biology second?

We do chemistry first because atoms and molecules are powerful foundations for cell biology, which naturally progresses into macroscopic organisms, physiology, and ecosystems. Then additionally, because doing physics third allows time for students' math skill to grow stronger.

LSL 1's last lessons are solutions chemistry (concentrations), which lead smoothly into diffusion across the cell membrane, which is where LSL 2 picks up. We begin by exploring the cell membrane at the molecular level, which our students pick up rapidly because of their sound chemistry foundations, then move into diffusion, osmosis, and the rest of the organelles and their functions.

Our chemistry shines again as we progress into the organic macromolecules and nutrition. The organic macromolecules are classic biological topics, but we believe that all knowledge ultimately leads to self-knowledge. As such, we apply these ideas to the human body through a study of nutrition. Our students come to understand what their put into their bodies and what it does for (and to) them. Immediate, practical results in every-day life, if we so choose.

Cell mechanics and genetics are next and also benefit heavily from our foundations in chemistry, as they are both ultimately biochemical processes. We study karyotypes, Punnett Squares and heredity, then progress into the macroscopic world. Organisms are viewed as part of a great whole, an ecosystem, like atoms in a molecule, and we observe their dynamics across time, elucidating interactive processes like natural selection and evolution. Everything is interconnected; everything affects and is affected by everything else, if only ever so slightly.

Then again, all along the way, language is our faithful servant. It helps us unlock difficult words, organize information, form thoughts, and communicate well. We learn more morphemes, expand our vocabulary further, diagram more sophisticated sentences, become more modular with our words (word webs!), and begin responding to timed, in-class writing prompts. Our language really comes together here in LSL 2; we leave with rock-solid foundations, which we build upon beautifully in LSL 3.

LSL's curriculum is the key to our success. It was crafted around the students: it flows through their natural curiosities, it establishes strong logical foundations without any steps of reason skipped, and it's designed to feel satisfying. It feels good to complete. It's also crafted as a series of questions in alignment with the Socratic method, which naturally stimulates student engagement and activates curiosity. Questions furthermore provide an opportunity for students to show what they do know, and sometimes, even cobble together the correct answer from several different voices working together.

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We begin each lesson with a review of the homework to ensure understanding - students know their task is to check and correct (most important!) their work. This is where understanding is refined and any lingering question are answered. Then we work through a classwork to lay out our new ideas and ensure students engagement. 4 pages of CW (2 science, 2 language) and 6 pages of HW (3 language, 3 science) every week, extremely consistent so kids can plan accordingly. Little islands of stability help the children explore the unknown more boldly. 36 lessons across 36 weeks with fall, winter, and spring breaks. Effective, efficient, and beautiful.

Now, our theory must also be balanced by practicum. As such, we also perform experiments throughout the year to help us experience the phenomena we're discussing and calculating. We use every-day, household materials to make what we're learning feel real for our students because knowledge must be applied to be practical. Theory is a useful guide and means of exploration, but practicality, application, is the ultimate goal.

So, this is LSL 2. Biology, micro and macro, including the human perspective. Strong curriculum, smooth experience, and as much fun as we can have along the way. We're here to do work, and the work gets done, but it should be a positive, uplifting experience.

Then we come back for LSL 3's physics again in the fall to complete our fundamental science and language education!

