



Alive In Science

A full-credit, year-long middle school science course taught in person — where students investigate, experiment, and explore the world around them every single week. Students work through guided workbooks, run real labs every unit, and finish each semester with an independent project they design and present themselves. Real science, real fun, no textbook required.

1st Semester

Unit 1: Cell Biology (ALIGNS WITH NGSS MS-LS1-1, MS-LS1-2, MS-LS1-6)

- Week 1 — Life's Smallest City: Students learn the structure and function of key animal cell organelles and explore how the cell membrane maintains homeostasis through selective permeability.
- Week 2 — Why Plants Don't Need Lunch Money: Students compare plant and animal cells, examining why plants need a cell wall, chloroplasts, and central vacuole — and how osmosis and photosynthesis connect to those structures.
- Week 3 — The Ultimate Freeloader: Students explore viruses, the prokaryotic vs. eukaryotic distinction, and apply both in a microscopy lab where they prepare their own slides and compare six cell types.

Unit 2: Ecosystems & Human Health (ALIGNS WITH NGSS MS-LS2-1, MS-LS2-3, MS-LS2-4)

- Week 4 — Somebody's Lunch: Students trace energy flow through an ecosystem from sun to decomposer, learn the 10% rule, and explore why every level of a food chain depends on the ones below it.
- Week 5 — Your Body Is at War: Students examine how the immune system detects and responds to threats, and how pollutants entering through air, water, and food disrupt that system at the cellular level.
- Week 6 — It Gets Worse at the Top: Students learn how pollutants concentrate as they move up a food chain through bioaccumulation and biomagnification, then test the dose-response relationship firsthand in a live Daphnia bioassay lab.

Unit 3: Earth, Resources & Health (ALIGNS WITH NGSS MS-ESS3-1, MS-ESS3-2, MS-ESS3-3, MS-ESS3-4, MS-ESS3-5, MS-LS2-5)

- Week 7 — Earth Doesn't Restock: Students explore Earth's four spheres and the resources each one provides, distinguishing renewable from non-renewable and

tracing what happens to human health and survival when those systems are depleted.

- Week 8 — When the Planet Pushes Back: Students investigate natural hazards — earthquakes, floods, wildfires, and more — analyzing how scientists forecast risk and what it actually takes to survive a disaster.
- Week 9 — What Happened to the Land? Students examine how urban development has damaged Earth's systems over the past century, then design a real proposal to restore a dead space in their own community.

Independent Project & Semester Wrap Up (ALIGNS WITH NGSS MS-ETS1-1, MS-ETS1-2)

- Week 10: Students choose a topic from semester 1 and investigate it — see the Independent Project Guide.
- Week 11: Students present their findings — see the Independent Project Guide.
- Week 12: Review — Game Show Style

2nd Semester

Unit 4: Matter & Chemistry (ALIGNS WITH NGSS MS-PS1-1, MS-PS1-2, MS-PS1-5)

- Week 1 — The Stuff of Everything: Students explore matter from the atom up — atomic structure, elements, physical and chemical properties, physical and chemical changes, and how the periodic table is organized.
- Week 2 — Nothing Disappears: Students examine how matter combines and transforms — classifying elements, compounds, and mixtures, exploring covalent and ionic bonds, chemical reaction types, and the basics of acids and bases.
- Week 3 — Bitter, Sour, or Just Right: Students learn how acids and bases neutralize each other, how the pH scale works, and apply both concepts in a lab where they test and classify household substances using litmus paper.

Unit 5: Nutrition, Digestion, & Electrolytes (ALIGNS WITH NGSS MS-LS1-3, MS-LS1-7)

- Week 4 — You Are What You Eat: Students explore six nutrient categories — learning what each one does, where it comes from, and what happens when the body gets too much or too little.
- Week 5 — It's a Long Way Down: Students trace food through the entire digestive system, examine how mechanical and chemical digestion work together, and follow glucose to where it becomes usable energy.
- Week 6 — Live Wire: Students investigate electrolytes — what they are, how they carry electrical charge, and why the body depends on them. Then they build a working circuit and test whether common solutions conduct electricity, connecting their results to how nerves actually send signals.

Unit 6: Reproduction & Growth (ALIGNS WITH NGSS MS-LS1-4, MS-LS1-5, MS-LS3-2)

- Week 7 – The More the Merrier: Students explore courtship behaviors and parental care in animals, pollination and flower structure in plants, and compare sexual and asexual reproduction across both kingdoms.
- Week 8 – Born This Way: Students identify reproductive cells in plants and animals, explore how sexual reproduction produces unique offspring through a paint mixing activity, and examine how genetic and environmental factors together shape how an organism grows.
- Week 9 – What's Inside a Seed: Students learn how seeds disperse and what they contain, then dissect lima beans at three stages of development to observe the embryo, cotyledon, and seed coat in action.

Independent Project & Semester Wrap Up (ALIGNS WITH NGSS MS-ETS1-3, MS-ETS1-4)

- Week 10: Students choose a topic from semester 2 and investigate it – see the Independent Project Guide.
- Week 11: Students present their findings – see the Independent Project Guide.
- Week 12: Review – Game Show Style