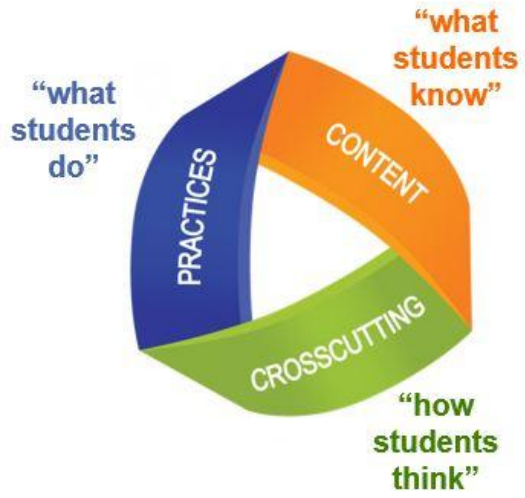
Lake Orion High School

Science Curriculum Update

The last science curriculum adoption at LOHS was in **2006**, using a textbook published in **2002**.

- In **2015**, Michigan adopted the Michigan Science Standards, aligned with the Next Generation Science Standards (NGSS).
- The NGSS are **fundamentally different** from previous standards and require a major shift in instruction and learning that textbooks cannot provide.
- Through the work of coaches and curriculum specialists, the elementary and middle levels have adopted curricula that are aligned with the NGSS. **We are seeking continuity of this work at the high school.**



Standards Alignment & M-STEP

Scientific & Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Crosscutting Concepts

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function
7. Stability and change

Disciplinary Core Ideas

Physical Sciences

PS1: Matter and its interactions

PS2: Motion and stability: Forces and interactions

PS3: Energy

PS4: Waves and their applications in technologies for information transfer

Life Sciences

LS1: From molecules to organisms: Structures and processes

LS2: Ecosystems: Interactions, energy, and dynamics

LS3: Heredity: Inheritance and variation of traits

LS4: Biological evolution: Unity and diversity

Earth and Space Sciences

ESS1: Earth's place in the universe

ESS2: Earth's systems

ESS3: Earth and human activity

Engineering, Technology, and Applications of Science

ETS1: Engineering design

ETS2: Links among engineering, technology, science, and society

Standards Alignment

NGSS Standards are organized into three bundles:

- Life Science
- Physical Science
- Earth & Space Science

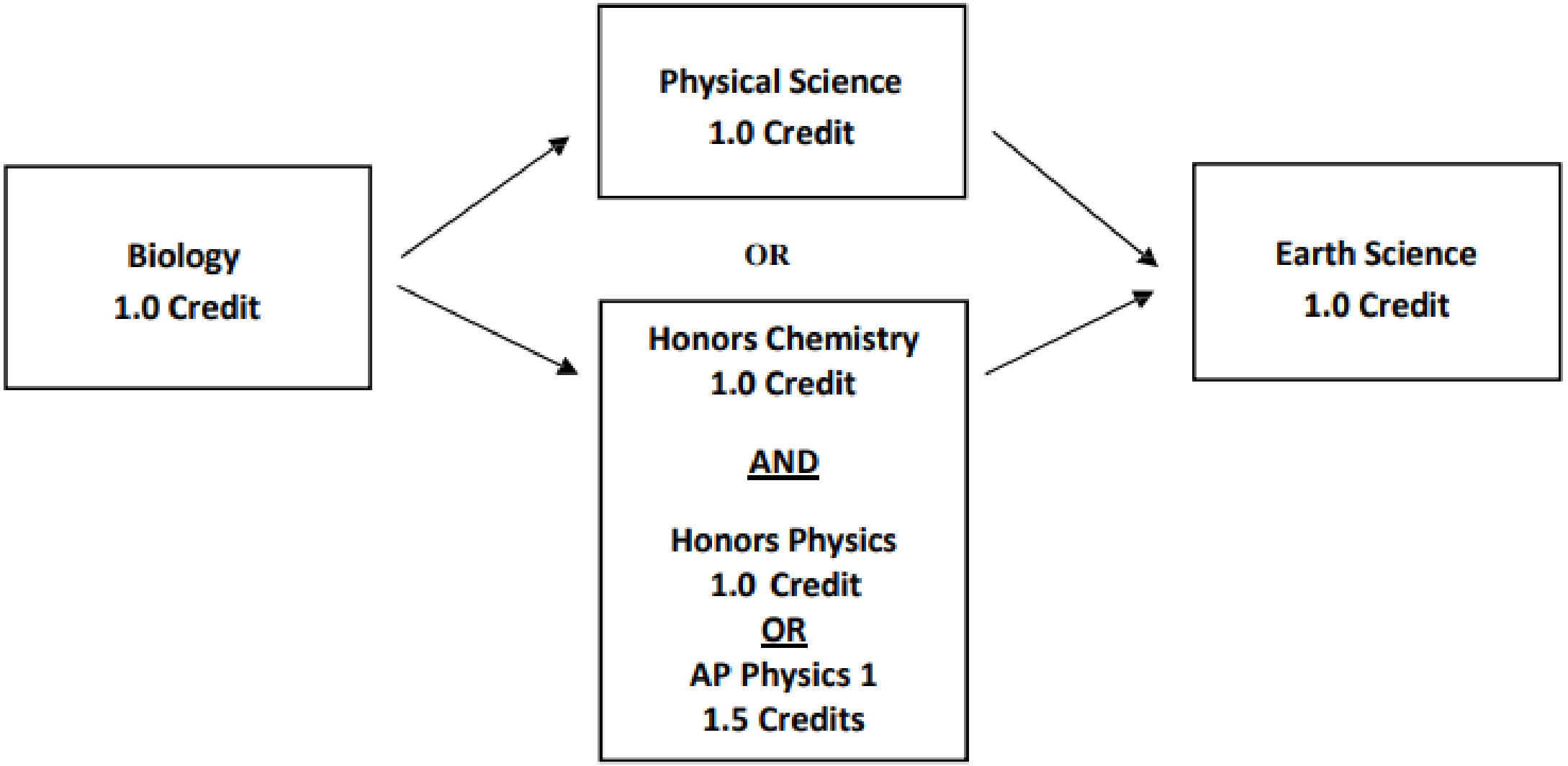
OpenSciEd rearranges the same standards:

- Biology
- Chemistry
- Physics

} Earth Science + Science & Engineering Practices

What are the benefits of OpenSciEd's alignment for all students?

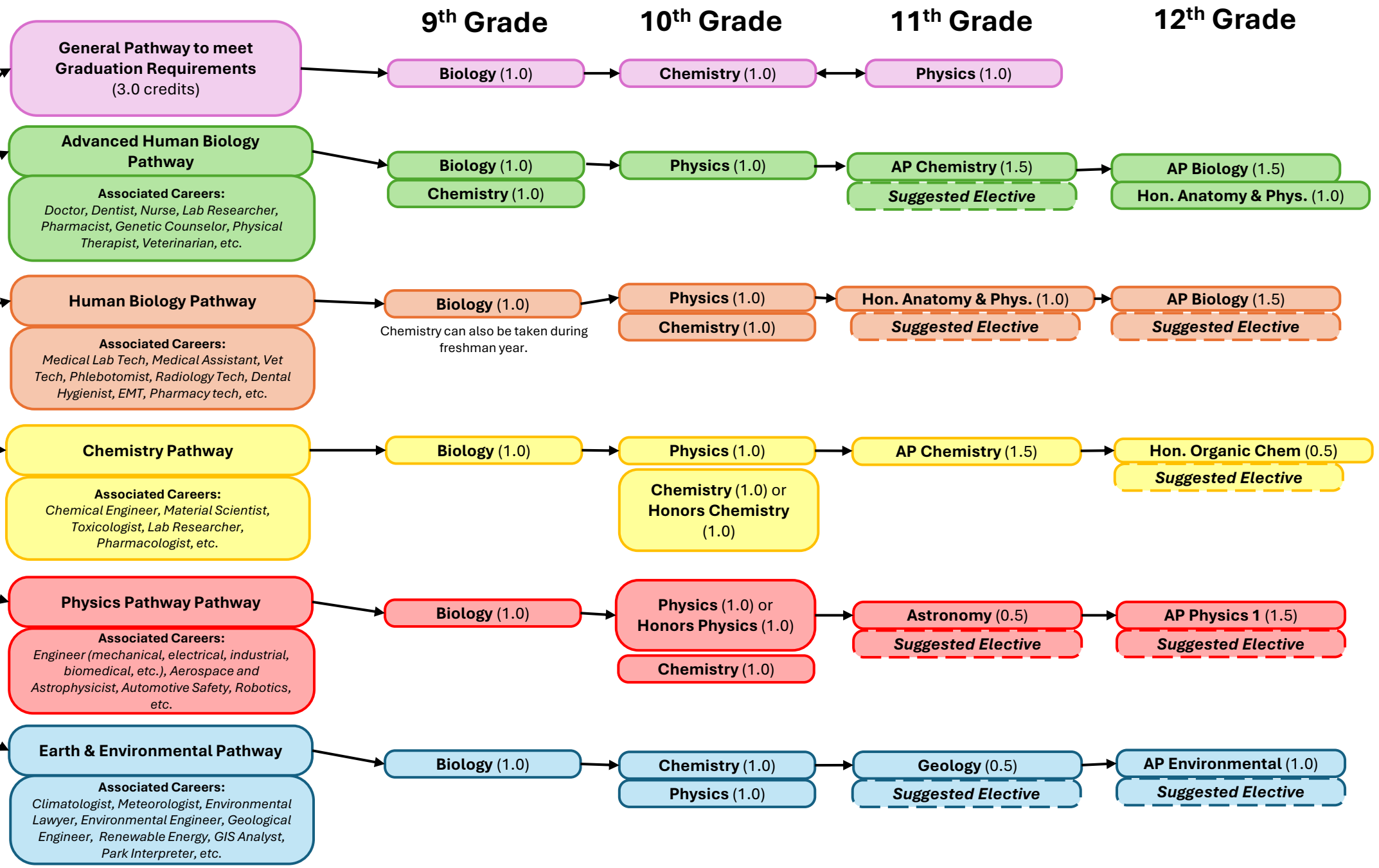
Current Science Pathway



Please note that these are **sample pathways**. There are many different paths students can take towards their career goals. Talk to a counselor or science teacher for more guidance.

Pathways in Science

Students wishing to take more science coursework are encouraged to enroll in ***Suggested Electives***. A list of suggested electives has been created for each pathway to complement the main courses of study.



Piloting Timeline

Spring/Summer 2024

- "Future of Science" Committee is assembled. All members of department are invited to join.
- Teaching & Learning provides funds to run pilots.

Fall/Winter 2024

- Instructional coaches & 8 teachers begin attending "Level Up!" trainings at Oakland Schools
- Meaghan Everitt pilots 3 of 4 OSE Biology units

Spring 2025

- Two teachers pilot OSE Biology (Everitt, Grisdale)
- Earth Science classes pilot parts of OSE units (Kogut)
- Physical Science classes pilot 2 OSE Physics units (Kogut)

Summer 2025

- PASCO Portal is added and materials/equipment purchased for further piloting

Fall 2025

- OSE Biology implementation of 4 units (full course) (Grisdale, Everitt, Ochenski, Polonkey, McDonald)
- Physical Science classes pilot 2 OSE Physics and 2 OSE Chemistry units (Kogut, Grisdale)

January 2026

- Decided to run pilots in Honors classes

Spring 2026

- Continued OSE Biology implementation of 4 units (full course) (Grisdale, Everitt, Ochenski, Polonkey, McDonald)
- Continued Physical Science classes pilot 2 OSE Physics and 2 OSE Chemistry units (Kogut, Grisdale, Morgan)
- Honors Physics class pilots 1 unit from OSE Physics (McSweeney)

Summer 2026

- Summer Work for Honors Pilot materials (Ochenski, Ketelhut, Kogut, Nash)

Fall 2026

- Continued OSE Biology implementation of 4 units (full course) (Grisdale, Everitt, Ochenski, Polonkey, McDonald, Coletti)
- Continued Physical Science classes pilot 2 OSE Physics and 2 OSE Chemistry units (Kogut, Grisdale, Morgan, Ketelhut, Babila)
- Honors Physics classes fully pilot OSE Physics units (Ketelhut)
- Honors Chemistry classes fully pilot OSE Chemistry units (Kogut)
- **Department-wide professional development on instructional practices that are required for OSE curriculum implementation**

What Our Students Say...

"My teacher helps us learn by **asking US questions**. She makes sure we are understanding what we are doing but in a way that makes us think.“

“I like following a theme throughout a unit because it gives context to what we are talking about. By using lightning for example, it makes it easier to understand how to **apply our knowledge to the outside world/real life** on the molecular level.”

“It was a **challenge** to begin with, especially when my other classes just teach straight to me. But eventually I got the hang of it, learned a lot and maintained the information.”

“Having us use whiteboards frequently and do things as a class is very helpful because we get to **hear everyone’s ideas** on things, and see all situations in every perspective.”

What Our Educators Say...

"I appreciate the use of videos, graphs, and pictures because they provide **multiple entry points into complex science concepts**, reducing reliance on text-heavy instruction. Additionally, online simulations allow students to experiment and see cause-and-effect relationships without needing advanced language skills. Furthermore, card games and dice games encourage collaboration with English speaking peers and reinforce concepts and processes in a low-stakes, fun environment. EL learners also benefit from activities like building models with candy make abstract concepts tangible, supporting comprehension through physical representation. Students can show their learning throughout the lessons using white boarding, which give EL learners a chance to express their knowledge even if they are in the beginning stages of writing in English. Overall, by combining visuals, kinesthetic activities, interactive tools, and opportunities to express learning through model representation, the curriculum **aligns with sheltered instruction strategies** that benefit ELs."

"I personally like having a set storyline that the kids are able to build off of. The progress tracker also helps them have a place to organize the information they are learning and input the context in which we learned it as a reference cue. I think it is easy to accommodate most assignments to fit the class as a whole, meeting the needs of each student learning. This curriculum is also good at holding the kids accountable for their own learning and encouraging good attendance."