

Science Instruction

Vision & Core Beliefs

Grades K–8 | 2025–2026

Our Vision: *Science instruction at Endeavor Charter School is intentional, inquiry-driven, and student-centered — grounded in evidence-based practice and designed to develop both scientific knowledge and scientific thinking in every learner.*

OUR PURPOSE

Science instruction at ECS is intentionally designed to develop deep scientific understanding, genuine curiosity, and the habits of mind that allow students to think, question, investigate, and reason from evidence. Instruction emphasizes inquiry, sense-making, and real-world connection so that all students understand not just what we know about the natural world — but how we come to know it.

Every instructional decision — from how we design a lab to how we assess and support students — is made in service of this purpose. The beliefs and principles below describe what that looks like in practice.

CORE BELIEFS

We believe effective science instruction at ECS:

01 Is best learned through doing.

Hands-on experiments, model building, and active investigation are not supplemental — they are the heart of science instruction. When students explore and discover, they develop the habits of mind of real scientists, not just a collection of memorized facts. Prioritize labs, investigations, and simulations in every unit. Technology enhances hands-on work; it does not replace it.

Students learn science by doing science.

02 Ensures all students can think, reason, and act like scientists.

Every student, when given meaningful access to inquiry-based instruction, is capable of rigorous scientific thinking. Equitable access is non-negotiable. We provide scaffolds, accommodations, and enrichment within Tier 1 instruction so that no student is excluded from the work of science. We plan for our highest-level thinkers first, then scaffold access so all students can engage with grade-level science.

03 Positions curiosity as the engine of learning.

Science instruction begins with questions, not answers. Real-world phenomena — things students can observe, notice, and wonder about — launch our lessons and anchor our units. Through the QUEST framework, students ask meaningful questions, investigate with purpose, and refine their thinking based on evidence, mirroring the authentic work of science.

Students are working more than teachers are talking.

04 Teaches scientific knowledge and scientific practices together.

Content knowledge alone is insufficient. Students must simultaneously learn to ask testable questions, collect and analyze data, construct arguments from evidence, develop models, and communicate findings. These are not separate skills — they are the integrated work of science. We never teach scientific practices as isolated exercises, and we never teach content divorced from inquiry.

05 Requires evidence and reasoning to anchor all student thinking.

A conclusion is only as strong as the data and logic behind it. Science is not opinion. Through the CER method — Claim, Evidence, Reasoning — students learn to ground every explanation in specific data and connect that data to scientific principles. We cultivate classrooms where evidence is examined critically, conclusions are revised when data demands it, and multiple approaches are celebrated as evidence of scientific thinking.

We teach the “what” and the “why” together, always.

06 Maintains high expectations and rigorous thinking for all learners.

We plan instruction for the highest level of achievement and scaffold downward to bring all students to that standard. We do not plan for the middle and adjust upward. Rigor is the baseline, not the ceiling. We do not offer separate remedial tracks. Instead, we differentiate within Tier 1 instruction through flexible grouping, targeted questioning, and responsive support — ensuring every student is growing, not just some.

07 Is guided by scientific conversation and daily discourse.

Structured discussion is a non-negotiable part of every science lesson. Students are expected to explain their reasoning, listen to peers, and revise their thinking through conversation. Sense-making debriefs after investigations, evidence-based argument, and collaborative problem-solving make student thinking visible and build understanding through discourse. Writing about science — including the CER method, lab reports, and journals — extends this discourse beyond spoken language.

Discourse deepens understanding. Silence is not learning.

08 Connects science to the world students live in.

Real-world relevance makes science meaningful and memorable. Whenever possible, new concepts are introduced through authentic phenomena — real events, data sets, and

observations that give purpose to scientific learning. We teach students to analyze situations with genuine curiosity, building real understanding rather than surface-level recall. When students see science in their daily lives, engagement deepens and understanding lasts.

09 Is continuously informed by assessment data and student evidence.

Formative assessment is embedded in every lesson. Exit tickets, whiteboard checks, lab observations, pre-assessments, and common assessments all provide data that teachers use to group students flexibly, adjust pacing, target reteaching, and extend learning. Instruction is not fixed — it is responsive. Grouping decisions are driven by evidence, not assumption.

10 Is strengthened by a culture of teacher collaboration and shared ownership.

Our instructional practice is a collective endeavor. Through weekly grade-level meetings, monthly IMPACT sessions with our Instructional Coach, and co-planning and co-teaching experiences, we continuously refine our craft together. We share data, analyze student work, and hold each other to high standards — because the quality of our collaboration directly shapes the quality of our students' learning.

INSTRUCTIONAL DESIGN PRINCIPLES

These principles describe how our core beliefs translate into daily instructional practice.

Lesson Structure

Every science lesson follows a consistent arc: a phenomenon launch or warm-up that activates curiosity → vocabulary instruction with visuals and examples → inquiry or hands-on investigation → data collection and analysis → structured discussion and sense-making debrief → reflection or written response (CER, exit ticket, or journal). The majority of instructional time is spent in investigation and sense-making, with students actively exploring and discussing.

The QUEST Inquiry Model

All grades use the QUEST framework to structure investigations: **Q**uestion → **U**nderstand → **E**xplore → **S**ynthesize → **T**est. This framework mirrors authentic scientific practice and scaffolds student thinking from question to conclusion. It is not a checklist — it is the rhythm of every investigation.

Scientific Writing, CER, and Lab Progression

All conclusions are written using the CER method: Claim — Evidence — Reasoning. Lab writing expectations build each year so that students in Grade 8 can independently design, conduct, and report a complete lab investigation. Formal labs (major grades) require full independent lab reports. Informal labs (minor grades) use teacher-provided scaffolding but

still require students to demonstrate mastery in observations, data collection, and conclusion writing.

Scientific Discourse, Literacy, and Vocabulary

Teachers plan explicitly for daily science discourse, structured discussion routines, and writing opportunities. Students use complete sentences and precise scientific vocabulary when explaining their thinking. Essential vocabulary is taught explicitly with visuals, gestures, and models; posted throughout the unit; and assessed formally and informally. Public speaking assignments and poetry tasks are planned with the same intentionality as any other learning opportunity.

Differentiation and Equitable Access

Teachers use whole-group, small-group, and individual instruction based on student needs. MTSS supports are embedded within Tier 1 — no student is separated into a remedial track. Tier 1 accommodations for students with IEPs or 504 plans are implemented consistently. Visuals, language supports, sentence frames, and multiple entry points ensure access for EC and multilingual learners. Group placement is always driven by formative data, not fixed ability.

Classroom Culture and Learning Environment

Teachers intentionally cultivate science classrooms where curiosity is celebrated, productive struggle is normalized, and errors are analyzed respectfully as part of the learning process. Lab safety rules are consistently taught and enforced. Clear procedures and routines for setup and cleanup are maintained. Students develop scientific confidence and a growth mindset through consistent routines that honor thinking over answer-getting and investigation over passive reception.

WHAT WE EXPECT STUDENTS TO BE ABLE TO DO

As a result of consistent, high-quality science instruction, ECS students will:

✓	Understand and apply scientific concepts and relationships deeply, not just as memorized facts.
✓	Design and carry out investigations, collecting and analyzing data to draw evidence-based conclusions.
✓	Communicate scientific ideas clearly using precise vocabulary, multiple representations, and written argument.
✓	Evaluate scientific claims, sources, and arguments for credibility and reasoning quality.
✓	Apply science learning to real-world problems and make connections to their lives and community.

✓	Approach science with curiosity, perseverance, and confidence — seeing themselves as scientists.
✓	Engage as curious, informed, and active citizens who use scientific thinking to navigate the world.

These beliefs and principles are not aspirations for the future — they are our commitments today. They guide every lesson we plan, every lab we design, every question we ask, and every conversation we have about student learning.