

The Alchemist's Compendium

K-12 learning roadmap

Planning edition 0.3 | September 29, 2026

This is a plan of topics and their order, not a textbook. It contains 13 levels and 52 proposed unit slots. The two introductory sections currently available provide seven lessons. They do not complete kindergarten. The remaining 50 proposed units need research, detailed instruction, practice, and review.

Four books follow one sequence

The Student Book supplies reading and illustrated explanations. The Adult Teaching Guide supports instruction. The Student Workbook contains matched activities and checks. The Answer and Assessment Guide supplies keys and criteria. Each component uses the same unit and lesson IDs.

Levels and readiness

Grade labels organize increasing complexity, not age deadlines. Beginning readers need adult read-aloud and support. Detailed placement instruments and a comprehensive topic coverage audit remain in development. Proposed demonstrations below are planning targets, not released assessments.

Kindergarten entry

Adult-supported observation, communication, and access adaptations; no independent reading required

Reading and page design

One picture and one concrete idea at a time. Short phrases and sentences, usually 2-6 words. Adult introduces unfamiliar labels; independent reading uses explicitly taught sounds and words.

SCI-K-01 | Observing and comparing

3 introductory lessons available; full strand coverage remains unfinished.

SCI-K-02 | Pushes and pulls

4 introductory lessons available; full strand coverage remains unfinished.

SCI-K-03 | Plants, animals, and needs

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-K-04 | Weather and local environments

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Record an observation, distinguish it from a preference, and ask a checkable question
- Compare the effects of simple pushes and pulls using an adult-guided test
- Use observations to describe organism needs and patterns in local weather

Research priorities

- Check observation skills and actual organism, weather, and motion claims with direct evidence and topic sources
- Verify accessible and safe materials for every adult-led investigation

Level 1

Demonstrated prerequisite skills from level K; placement is skill-based

Reading and page design

Short familiar sentences and brief decodable passages. Picture support, repeated sentence patterns, and one clear direction per activity.

SCI-1-01 | Light and sound

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-1-02 | Plant and animal structures

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-1-03 | Parents and offspring

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-1-04 | Patterns in the sky

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Use observations to explain selected relationships among light, vibration, and sound
- Compare structures of plants and animals and describe similarities between parents and offspring
- Record repeated sky observations and identify a pattern without inventing missing data

Research priorities

- Check that every planned task introduces its vocabulary, observational method, and evidence before assessment
- Verify sunlight-observation safety and avoid unsupported hereditary generalizations

Level 2

Demonstrated prerequisite skills from level 1; placement is skill-based

Reading and page design

Short paragraphs with familiar vocabulary. Introduce new words beside concrete pictures and examples; support a gradual move from decoding to fluent meaning.

SCI-2-01 | Materials and their properties

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-2-02 | Living things and habitats

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-2-03 | Landforms and water

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-2-04 | Designing and testing solutions

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Classify materials by observed properties and justify a choice for a simple purpose
- Compare habitats using recorded evidence about living things
- Model landforms and water and compare designs using stated criteria

Research priorities

- Ensure reversible changes, landscape change, and water states receive explicit coverage
- Check design-test fairness, materials safety, and the limits of classroom models

Level 3

Demonstrated prerequisite skills from level 2; placement is skill-based

Reading and page design

Connected paragraphs and short sections. Explain subject words in context; use labeled pictures, simple tables, and worked examples.

SCI-3-01 | Forces and magnets

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-3-02 | Life cycles and inherited traits

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-3-03 | Ecosystems and survival

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-3-04 | Weather patterns and hazards

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Use a controlled comparison to describe selected force and magnetic interactions
- Represent life cycles and distinguish inherited traits from environmental influences
- Use evidence to compare habitat suitability and weather-related solutions

Research priorities

- Verify trait and adaptation explanations without purposeful or need-driven evolution claims
- Verify fossil evidence, biological variation, climate patterns, and engineering claims using specialist sources

Level 4

Demonstrated prerequisite skills from level 3; placement is skill-based

Reading and page design

Several linked paragraphs with headings. Define new terms, explain diagrams, and connect concrete examples to simple generalizations.

SCI-4-01 | Energy and transfer

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-4-02 | Waves and information

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-4-03 | Structures, senses, and response

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-4-04 | Earth processes and landscapes

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Describe energy transfers using observations and an explicitly bounded model
- Use wave patterns to explain a simple information-transfer design
- Explain how organism structures and Earth processes relate to observable functions or changes

Research priorities

- Check model limits for waves, senses, and energy conservation
- Verify the required evidence for erosion, rock records, natural resources, and design activities

Level 5

Demonstrated prerequisite skills from level 4; placement is skill-based

Reading and page design

Longer explanations broken into purposeful sections. Introduce comparisons, multi-step examples, and simple source notes with guided practice.

SCI-5-01 | Matter and conservation

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-5-02 | Food, organisms, and ecosystems

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-5-03 | Earth systems and water

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-5-04 | Stars, shadows, and space

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Use measurements to test a claim about conserved matter in a suitable closed activity
- Model movement of matter among organisms and their environment
- Represent connected Earth-water systems and interpret repeated shadow or sky observations

Research priorities

- Verify that mass measurements, system boundaries, and measurement error are handled accurately
- Check the distinction among mass, apparent brightness, distance, and scale in space examples

Level 6

Demonstrated prerequisite skills from level 5; placement is skill-based

Reading and page design

Clear middle-grade prose. Define technical vocabulary, separate facts from inferences, and scaffold multi-step reasoning with diagrams and examples.

SCI-6-01 | Measurement, particles, and mixtures

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-6-02 | Cells and body systems

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-6-03 | Earth materials and plate tectonics

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-6-04 | Engineering investigations

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Choose units and record measurements to compare matter, particles, and mixtures
- Use a model to connect cells with selected body-system functions
- Explain a plate-tectonic pattern and compare engineering solutions using evidence

Research priorities

- Check the prerequisite order of measurement, particle models, cells, Earth materials, and engineering investigations
- Check microscope and material safety and establish ratios, units, and graph-reading prerequisites

Level 7

Demonstrated prerequisite skills from level 6; placement is skill-based

Reading and page design

More sustained explanatory reading. Build arguments from evidence and model how to read charts, excerpts, and multi-step procedures.

SCI-7-01 | Reactions and energy

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-7-02 | Reproduction and heredity

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-7-03 | Ecosystems and populations

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-7-04 | Weather, climate, and resources

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Use evidence to distinguish selected chemical reactions and describe energy changes
- Model inheritance and explain interactions affecting ecosystem populations
- Analyze weather or climate data and evaluate a resource-use claim with limitations stated

Research priorities

- Verify distinctions among weather, climate, correlation, and causal mechanisms
- Check chemical safety, reproductive-biology terminology, and mathematical preparation for rate and population graphs

Level 8

Demonstrated prerequisite skills from level 7; placement is skill-based

Reading and page design

Longer texts and increasingly independent analysis. Explain abstract ideas through examples before formal language and applications.

SCI-8-01 | Motion, forces, and fields

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-8-02 | Waves and information technologies

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-8-03 | Natural selection and evidence

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-8-04 | Solar system and Earth history

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Use models and data to explain motion, forces, fields, and wave behavior
- Explain natural selection using variation, inheritance, and differences in reproductive success
- Interpret evidence about the solar system and the relative sequence of Earth events

Research priorities

- Check the evidence and limits of evolutionary, geologic, and astronomical models
- Ensure algebra, proportional reasoning, and graph interpretation precede quantitative physical-science tasks

Level 9

Demonstrated prerequisite skills from level 8; placement is skill-based

Reading and page design

High-school subject prose with precise definitions, worked methods, source context, and explicitly labeled interpretation.

SCI-9-01 | Cells, metabolism, and homeostasis

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-9-02 | Genetics and biotechnology

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-9-03 | Evolution and biological diversity

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-9-04 | Ecology and environmental systems

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Connect cellular processes with organism regulation using a bounded model
- Interpret inheritance evidence and explain the limits of a biotechnology example
- Use evidence to explain biological diversity and analyze ecosystem interactions

Research priorities

- Verify contemporary biology claims with topic-specific primary or authoritative references
- Check prerequisites in atoms, bonds, matter cycling, probability, and data interpretation before mechanistic explanations

Level 10

Demonstrated prerequisite skills from level 9; placement is skill-based

Reading and page design

Extended explanations and evidence comparison. Scaffold unfamiliar specialist terms while increasing independent synthesis and application.

SCI-10-01 | Atomic structure and periodic patterns

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-10-02 | Bonding, quantities, and reactions

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-10-03 | Solutions, acids, and bases

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-10-04 | Energy, rates, and equilibrium

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Use atomic and bonding models to explain selected material properties
- Represent chemical quantities and reactions while conserving atoms and checking units
- Interpret solution, acid-base, energy, rate, and equilibrium evidence within model limits

Research priorities

- Require placement checks in ratios, metric conversion, powers of ten, and rearranging formulas
- Verify laboratory risk controls, chemical concentrations, model assumptions, and solution keys before release

Level 11

Demonstrated prerequisite skills from level 10; placement is skill-based

Reading and page design

Sustained analysis, complex sources, and multi-step projects. Explain assumptions, limits, and alternative interpretations supported by evidence.

SCI-11-01 | Kinematics and Newtonian mechanics

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-11-02 | Energy and momentum

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-11-03 | Electricity and magnetism

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-11-04 | Waves, optics, and modern physics

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Analyze motion data using appropriate Newtonian models and stated assumptions
- Apply energy and momentum relationships to bounded systems
- Interpret electrical, magnetic, wave, and optical phenomena with suitable representations

Research priorities

- Check algebra, graph slopes, unit analysis, and required trigonometry before quantitative mechanics
- Verify electricity, optics, and radiation activity safety and limits of classical models

Level 12

Demonstrated prerequisite skills from level 11; placement is skill-based

Reading and page design

Advanced secondary reading and independent inquiry. Use precise subject language, transparent sources, and capstone applications; optional extensions remain labeled.

SCI-12-01 | Astronomy and cosmology

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-12-02 | Geology, oceans, and climate evidence

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-12-03 | Agriculture, materials, and engineering

Planned. Topic research, lessons, exercises, and assessments are not yet released.

SCI-12-04 | Computing, data, and research capstone

Planned. Topic research, lessons, exercises, and assessments are not yet released.

Proposed demonstrations

- Evaluate astronomical and Earth-system explanations using identified evidence
- Compare environmental or engineering options against stated criteria and uncertainty
- Develop a reproducible computing or data investigation and communicate its limitations

Research priorities

- Verify current climate, astronomy, and technology claims at drafting and release
- Check data provenance, computational reproducibility, statistics prerequisites, and the distinction between evidence and value judgments

Research and production gates

Each future topic requires authoritative evidence, explicit prerequisites, taught-before-tested content, cumulative practice, keyed assessment, illustrations that support the concept, and editorial and educational review. Framework references do not establish full coverage. No complete KDP edition is ready.

Sources for current sections

NASA Space Place: What Is Science?

Background on observation, questions, evidence, and revising explanations. Only these broad concepts inform the introductory paper-observation activities; the page is not a curriculum framework and its historical examples are not reproduced.

<https://spaceplace.nasa.gov/science/en/>

NASA Glenn: Newton's Laws of Motion

Adult background on force interactions and changes of motion. Kindergarten uses original slow, safe contact demonstrations, not the page's advanced equations or aerospace examples. Individual hand-push trials are not quantitative force measurements.

<https://www1.grc.nasa.gov/beginners-guide-to-aeronautics/newtons-laws-of-motion/>