ARETE HONORS SCIENCE - COURSE SYLLABUS

10th Grade Honors Chemistry

Chemistry for Accelerated Students

2026–2027 • Grade 10 • Weekly two-hour tutorial

"And if a person gains more knowledge and intelligence in this life through his diligence and obedience than another, he will have so much the advantage in the world to come."

—Doctrine and Covenants 130:19

"Rigorous standards and high achievement in any field of learning are not at odds with faith and devotion to the gospel of Jesus Christ. Strive for excellence, use the talents that the Lord has given you, meet and master the learning of men."

—Dallin H. Oaks

Scale How School - Arete Honors Living Science

Course Description

Arete Honors Chemistry is a rigorous, mastery-oriented high-school chemistry course using Chemistry for Accelerated Students by John D. Mays, 2nd edition (ISBN 9780997284539). It assumes readiness for sustained algebraic problem solving, precise scientific writing, cumulative review, and independent preparation between weekly tutorials.

The course combines a weekly two-hour tutorial with substantial home study. Topics include electromagnetic spectra and atomic models, electron configurations, periodic trends, bonding and molecular geometry, reaction types and stoichiometry, gases, solutions, acids and bases, thermochemistry, kinetics, equilibrium, oxidation-reduction, and electrochemistry.

The course follows the supplied lesson sequence through a weekly two-hour tutorial, structured home study, and separately scheduled laboratory sessions. Tutorial time emphasizes cumulative quizzes, difficult concepts, calculation coaching, discussion, and demonstrations. Laboratory work and data collection take place on a separate day chosen around the schedules of the enrolled students and instructor. Formal reports and lab-journal analysis develop accuracy, independence, and scientific communication.

Calendar: The tutorial follows the Davis County School District's 2026–2027 calendar. The first tutorial is Monday, August 24, 2026. Semester finals are Monday, December 14, 2026, and Monday, May 10, 2027. No tutorial is held on the holidays and breaks shown in the pacing guide.

Course Information	
Instructor	Rachel Gooch
Tutorial Meeting	Day and time arranged with enrolled families
Location	_____
Course Text	Chemistry for Accelerated Students by John D. Mays, 2nd edition (ISBN 9780997284539)
First Tutorial	Monday, August 24, 2026
Semester Finals	Monday, Dec. 14, 2026 and Monday, May 10, 2027
Grade Level	10th Grade

Course Color

Slate blue - used for the 10th Grade Honors Chemistry Anki deck and coordinated course materials.

Course Promise

Complex does not mean impossible. Every major concept is taught with a visual model, an analogy or memory tool, guided practice, and repeated opportunities to explain the idea in the student's own words.

Primary Course Objectives

- Relate electromagnetic spectra and quantum ideas to atomic models, orbitals, electron configurations, and periodic structure.

- Explain periodic trends, valence, ionic, covalent, and metallic bonding, Lewis structures, molecular geometry, polarity, and intermolecular forces.
- Name and write formulas for ionic and molecular compounds, acids, hydrates, polyatomic ions, and reaction products.
- Balance chemical equations and solve mole, stoichiometry, limiting-reagent, theoretical-yield, and percent-yield problems.
- Apply kinetic molecular theory and gas laws to pressure, temperature, volume, molar mass, density, mixtures, diffusion, and effusion.
- Explain dissolution, electrolytes, solubility, concentration, net ionic equations, and colligative properties.
- Apply acid/base theories and calculate hydronium, hydroxide, pH, and unknown concentrations from titration data.
- Analyze enthalpy, Hess's law, Gibbs free energy, reaction rates, mechanisms, activation energy, and rate laws.
- Use equilibrium constants, Le Chatelier's principle, dissociation constants, buffers, hydrolysis, and Ksp relationships.
- Balance redox equations and explain electrochemical cells, electrode potentials, and electrochemical applications.
- Work safely, maintain a complete lab journal, analyze uncertainty, and write independent formal lab reports with clear calculations and graphs.

Course Structure and Expectations

In the Tutorial

- Open with gratitude, prayer, hymn, and catechism.
- Review the previous quiz and handwrite a quiz-review (QR) card for each missed or incomplete item.
- Complete a timed, cumulative written quiz in complete sentences and, when appropriate, show all quantitative work clearly.
- Discuss the assigned reading, difficult concepts, worldview questions, exercises, and student questions.
- Participate in demonstrations, interpretation or problem-solving practice, calculation practice, and project presentations.
- Complete all quizzes, chapter assessments, and semester finals in person during the regular tutorial; complete laboratory investigations during the separately scheduled in-person lab sessions.

Tutorial and Laboratory Scheduling

- The weekly two-hour tutorial day and time will be finalized with the enrolled families according to the schedules of the students and instructor.
- Chemistry laboratories meet in person on a separate day from the weekly tutorial. The lab day and time will likewise be selected around the availability of the enrolled students and instructor.

Scheduled Study-Hall Support

Scale How School will employ an additional chemistry tutor with AP Chemistry experience to assist students during scheduled study-hall sessions. These sessions will provide guided support with difficult problem sets, calculations, and course review; dates and times will be communicated to enrolled families.

At Home

- Students will have access to supplemental instructional videos to reinforce difficult or unfamiliar concepts. These videos support, but do not replace, assigned reading, tutorial instruction, problem-solving practice, or active participation.
- Use the Read, Recall, Check (RRC) study regimen for every assigned text section and record organized notes in the commonplace journal. (daily)
- Complete daily Anki study (normally 15–30 minutes), rehearse handwritten QR cards, and continue cumulative review rather than cramming. (daily)
- Complete assigned chapter exercises, problem sets, study questions, or Review Guide work. (as needed)
- Complete the weekly Moodle check-in and any assigned class discussion or submission. (weekly)
- Write individual lab reports after investigations, revise work from instructor feedback, and complete one independent science project or presentation per semester.
- Plan for approximately 60–90 minutes on most weekdays (about 5–8 hours per week) of focused home study during a typical week, with additional time near lab-report, project, or final-exam deadlines.

Mastery and Study Systems

RRC Study Cycle: Inspect–Question–Read–Recall–Check

Students use this complete cycle for every assigned Upper School text section. Begin by surveying a text's structure and signposts, then read it closely with a governing question.

1. Inspect. Survey the assigned section before close reading: notice the title, headings, subheadings, diagrams, captions, bold terms, summaries, and overall structure.
2. Question. Turn the section heading into a question that the reading should answer.
3. Read. Read the section attentively with that question in mind.
4. Recall. Close the book. Answer the question from memory and reconstruct the main idea, process, diagram, and key words in the student's own words.
5. Check. Reopen the text. Correct errors or omissions in a different color. If the idea remains unclear, write a specific question to bring to the tutorial.

Five-Step Study Rescue

If the Check step shows that one important idea is still unclear, use the rescue on that one idea, then return to normal RRC study.

1. Shrink it. Choose one process, diagram, relationship, or paragraph—not the whole chapter.
2. Sketch it. Draw the parts and arrows before trying to memorize precise wording.

3. Say it. Explain the idea aloud as if teaching a younger student.
4. Compare it. State what the idea is and what a nearby, easily confused idea is not.
5. Retrieve it. Close every source and rebuild the explanation or diagram from memory; then check once more in a different color.

Enrollment and Code of Conduct

Enrollment is not complete until a parent or guardian submits the required Scale How School Student Code of Conduct and Host-Home Agreement. The digital agreement addresses respect for the host residence and property, authorized areas of the home, class etiquette, electronic devices, academic integrity, laboratory safety, and consequences for misconduct.

Parents are responsible for reviewing the agreement with each enrolled student. Completion of the agreement is a condition of enrollment and continued attendance. Serious misconduct—or repeated failure to follow the agreement—may result in dismissal or expulsion from the tutorial.

Required before enrollment: parent or guardian digital acknowledgment and signature.

Required Materials

Student edition: Families may purchase the second edition. The instructor will use the third-edition e-book as a teacher reference and will provide any necessary supplemental instruction; students are not required to purchase the third edition.

- Chemistry for Accelerated Students by John D. Mays, 2nd edition (ISBN 9780997284539)
- The Student Lab Report Handbook by John D. Mays (a resource intended for continued use through high school and college)
- Standard lab journal with quad ruling
- A set of lined index cards with a ring; bring it every week for handwritten quiz-review cards. The ring may be clipped into the binder or stored in the binder pouch.
- Three-ring binder with five dividers labeled Syllabus, Reference, Quizzes, Class Notes, and Lab
- A durable commonplace journal for independent RRC notes; a journal with page numbers and a table of contents is recommended, and it must come to class each week; this journal may be used in other classes and is encouraged to be used from year to year
- Pencils, pens, scissors, and a three-hole ruler that can remain in the binder
- A three-ring binder pouch large enough for writing utensils, calculator, and quiz-review cards
- Independent project supplies; students and parents are responsible for materials used for individual science projects and presentations
- Advanced scientific or graphing calculator; a TI-84 or equivalent is recommended for scientific notation, graphing, and repeated quantitative work

Encouraged Family Outside Reading

Each Arete family is encouraged to keep one shared family copy of The God Proofs: How Science Points to YOUR Creator by Douglas Ell. This is optional family outside reading, not a class-specific text, and it may or may not be referred to during tutorials.

Laboratory and Investigation Program

The course includes a focused program of quantitative and conceptual laboratory investigation scheduled on a separate day from the weekly tutorial. The table below identifies the concepts and skills the program is intended to teach; it is not a fixed list of required activities. The instructor may select investigations from Kristin Moon's science labs, Novare Science resources, or a combination of appropriate sources. Some investigations receive a formal report; others may receive a lab-journal analysis, as designated by the instructor.

Strand	Concept or investigation focus	Learning emphasis
1	Flame Tests and Metal-Cation Identification	Use emission evidence to identify ions; connect spectra to atomic structure.
2	Separation of Components in a Mixture	Design and evaluate a separation using physical properties and mass data.
3	Intermolecular Forces	Compare observable properties with molecular polarity and intermolecular attraction.
4	Limiting Reactant and Percent Yield	Use stoichiometry to predict yield and compare theoretical and experimental results.
5	Mole Amount of a Gas	Apply gas laws and stoichiometry to experimental measurements.
6	Molarity	Prepare or analyze a solution quantitatively using concentration relationships.
7	Acid–Base Titration	Determine an unknown concentration and document endpoint and calculation quality.
8	Calorimetry and Hess's Law	Measure heat transfer and compare experimental enthalpy with a calculated pathway.
9	Rate Law Determination	Determine a reaction-rate relationship from controlled data.
10	Le Chatelier's Principle	Observe equilibrium shifts and explain them using stress-response reasoning.
11	Electrochemical Series	Measure or compare cell behavior and relate evidence to electrode potentials.

All experimental work and data collection take place during the separately scheduled in-person laboratory sessions. The instructor may designate selected activities as journal-only investigations rather than full formal reports.

Grading Plan

Weekly cumulative quizzes form the large majority of each term grade. All quizzes and semester exams are completed during the regular tutorial. Laboratory investigations occur during separately scheduled in-person lab sessions; students write reports independently at home and prepare special projects for presentation.

How Each Term Average Is Calculated

Component	Grade Contribution
Weekly cumulative quizzes	70%
Homework assignments	5%
Lab reports and lab journal	15%
Special projects or presentations	10%
Total	100%

How the Final Course Grade Is Calculated

Component	Grade Contribution
Fall term average	40%
Fall semester exam	10%
Spring term average	40%
Spring semester exam	10%
Total	100%

Semester exams are given during the final tutorial meeting of each term. Exact dates will be communicated after the weekly tutorial schedule is finalized with enrolled families.

Course Policies

Attendance: Regular attendance at the scheduled weekly tutorial and separately scheduled laboratory sessions is essential. Notify the instructor in advance when possible. Quizzes, labs, and finals may not be completed independently at home; any permitted make-up must be arranged and supervised by the instructor.

Preparedness: Arrive with the assigned RRC study and notetaking complete, required materials in hand, QR cards reviewed, and questions marked for discussion.

Late Work: Late work is accepted according to the instructor’s stated policy. Lab reports are ordinarily due within one week of the investigation unless the schedule or instructor provides a longer report window.

Lab Safety: Follow all oral and written safety directions. Unsafe conduct may result in immediate removal from an activity, an alternate assignment, dismissal from class, or expulsion under the behavior policy.

Academic Integrity: Submitted work must represent the student’s own thinking and effort. Data, sources, quotations, digital assistance, and collaboration must be acknowledged when appropriate. Students may discuss an investigation but may not share or copy report text, calculations, graphs, or digital files.

Schedule Changes: Weather, material availability, class progress, and student needs may require adjustments. The instructor will communicate changes through Moodle or the usual family communication channel.

Optional Science and Nature-Lore Reading

These optional selections are adapted from AmblesideOnline's current science and natural-history recommendations for AO Year 10. They are not required, graded, or a substitute for assigned course reading. Families may choose according to interest and reading level; parent read-alouds and audiobooks are welcome.

- Six Easy Pieces — Richard Feynman (AO Year 10)
- Microbe Hunters — Paul de Kruif (AO Year 10)
- The Sea Around Us — Rachel Carson (AO Year 10)
- Great Astronomers — Robert S. Ball (AO Year 10)
- Walden — Henry David Thoreau (AO Year 10)

Current source schedules: AmblesideOnline Year 10 schedule