

Roanoke Valley Governor's School for Science and Technology
Applied Chemical Research Syllabus (2022-2023)

Steve Smith
ssmith@rvgs.k12.va.us

I. Course Information

a. Course Description

This elective allows students to examine the many ways chemistry affects our world. Major topics include materials science, food chemistry, environmental chemistry, nanotechnology, forensic science, consumer products, agricultural chemistry and space exploration. Each student conducts an experimental research project, and all students will write a scientific paper using VJAS format describing their research projects.

b. Gifted education strategies

This research elective will allow students to examine some of the many ways in which chemistry affects our world. From materials science, food chemistry, environmental chemistry, nanotechnology, and forensic science, to consumer products, agricultural chemistry, plant communication, adhesives technology, and space exploration, there is no human endeavor that does not in some way involve chemistry. After reviewing some of the basic concepts of chemistry, and examining some of the myriad ways in which chemistry influences our world, students will investigate, design, and carry out a research project on some aspect of applied chemistry. Sophisticated analytical instrumentation, when needed, can be accessed here at RVGS and/or at local colleges and universities. Students will be responsible for writing a research paper, creating a PowerPoint presentation, and participating in any science fair for which they qualify.

c. Text, Printed Resources, and Media Resources

What is Chemistry?, Peter Atkins, Oxford Univ. Press, 2013

Understanding the Science for Tomorrow: Myth and Reality, Jeffrey Grossman, MIT
(DVD series; various lectures)

What Plants Talk About, NOVA video

II. Grading Policy

a. Grading Scale

100-90%	A
89-80%	B
79-70%	C
69-60%	D
59-0%	F

b. Types of Evaluations

- i. Research Process (both semesters):** Anything having a direct impact on your research project, and actually performing your research project. Your efforts to stay focused, not waste time, and get things done to further your understanding of chemistry in our world, and to keep your research project going in a timely manner. This category will also include your lab book, lab safety, clean-up of lab space, labs done in class, your project ideas, your literature review, discussing your project with Mr. Smith, and any associated time management grade.
- ii. Research Paper (1st semester):** This will include your Problem Statement, Introduction (rough draft & revised), Literature Cited (rough draft & Revised), and any associated time management grade.
- iii. Research Paper (2nd semester):** This will include your paper components, completed paper in VJAS format, uploading your paper to the project Moodle site (see below), and any associated time management grade.
- iv. Research presentation:** your project display board components, your completed project display board, Project Forum (being on time, being dressed professionally), your PowerPoint presentation, and any associated time management grade.
- v. Homework:** Assigned reading or written work based on general elective content rather than students' individual research projects, lab reports, and any associated time management grade.

c. 1st Semester Grade Determination

Category	Weight
Research Process	45%
Research Paper	30%
Homework	25%

d. 2nd Semester Grade Determination

Category	Weight
Research Presentation	30%
Research Paper	30%
Research Process	40%

NOTE: For second semester, the final, edited paper will comprise 50% of the research paper category grade.

e. Final Grade Determination

The final grade is the average of the 2 semester grades.

III. Class Policies and Procedures

- a. **Absences and tardies:** The policy in the RVGS student handbook will be followed.
- b. **Make-up Work:** It is *the responsibility of the student*, once he or she returns to school after an absence, to check with Mr. Smith and determine what was missed. Appropriate due dates for that material will be provided.
- c. **Late work:** Late work is penalized 20% per calendar day.
- d. **Cheating:** The policy in the RVGS student handbook will be followed.
- e. **Technology Policy:** The RCPS Acceptable Use Policy and the RVGS student handbook policy will be followed.
- f. **Extra help:** Mr. Smith is available both before school and after school should a student need help outside of class.
- g. **Online grades:** Grades are available at all times through ParentVUE and StudentVUE. When viewing your grades, understand that:
 - i. A blank in the grade book means that the assignment has not yet been graded. Teachers will have all assignments graded within 5 school days of the due date (with the exception of very long assignments which will be graded within 10 school days). You may have a blank because the teacher has not graded the class set or because your assignment was turned in after the due date. Blanks do not count as zeros in your average.
 - ii. A zero in the grade book means that you have earned a zero on the assignment. Cases in which this might occur include submitting incorrect answers to an assignment or submitting an assignment past the due date.
 - iii. An excused (EX) in the grade book means that you are excused from the assignment without penalty.
- h. **Interim Reports:** A hard-copy of your current grade will be given to you to take home two times during each semester (see dates on the school calendar). The interim report is a snapshot of your current class average. Please feel free to discuss your report with your instructor.
- i. **Student Performance Strategy:** Interventions will be implemented at the teacher's discretion or in the event that the student's grade falls below an 80.
- j. **General classroom procedures**
 - i. Drinks are allowed in the classroom, but not food; neither drinks nor food is allowed in the lab areas.