

Roanoke Valley Governor’s School for Science and Technology
Fundamentals of Research
Syllabus 2021-2022

I. Course Information

a. Course Description

Fundamentals of Research (FOR) is required for all first year freshmen, sophomores, and juniors. This elective lays the foundation for the research process implemented in all upper level electives. Students in this course learn how to design and implement a research project which meets international science fair guidelines. During the first semester students develop a project idea, learn how to conduct research using the internet to find credible sources, write a formal introduction to a research paper on their topic, and design their experiment. During intersession, students implement their experimental design and maintain a detailed record of their experiences. Students also develop skills in data analysis using inferential statistics and computer software applications. Students will conduct a research project suitable for presentation at Project Forum and other science fairs. All students will write a scientific paper using VJAS format describing their research projects.

b. Gifted education strategies

All students in this course will develop a unique project that allows them to explore topics within their interests while acquiring the skills needed to design and conduct a research-based experiment. While each student’s experiment will involve a different set of lab skills, each student will master the process of designing and implementing an experiment that meets local, regional, and international science fair guidelines. Skills covered in this class are extensions of those learned in the student’s science and math courses. All first year freshmen, sophomores, and juniors are required to take Fundamentals of Research.

Text, Printed Resources, and Media Resources

Fundamentals of Research Course Moodle Site

Statistical Analysis Procedure

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 Paper/Project Display Board Components:** Students are expected to compose a rough draft, make all necessary revisions and submit a final draft of each part of the research paper. Since revision is an important part of the writing process, papers will be reviewed as needed. All students will be expected to make changes suggested by the instructor. All drafts of work will be graded for quality. If a student decides not to make changes suggested by the instructor, (s)he must make a notation in the margin and state why (s)he chose not to do so. All rough drafts must be turned in with final drafts.
- ii. Laboratory Notebook:** The lab notebook should contain detailed information about how the student performed the experiment. Each teacher will discuss the expectations of maintaining the lab notebook in his/her FOR section.
- iii. Experimental Process:** Students will be evaluated on how they execute their experiment during intersession. Students will be graded on all aspects of the experimental process from having all materials ready to begin experimentation the first day of intersession to making revisions to the experiment as needed. Lab safety and lab cleanup are also considered in this grading category. These types of evaluation will fall into the “other” grading category.
- iv. Presentation:** Each project will be presented at Project Forum using a poster and during class using PowerPoint. Both presentations will be graded using a rubric.
- v. Other:** Assignments that do not clearly fall into the above categories will be placed into this category. Examples include, but are not limited to, statistical analysis, peer review, etc.

c. Semester Grade Determination

Category	Weight	
	<u>Semester 1</u>	<u>Semester 2</u>
Research Paper/Project Display Board Components	40%	35%
Other	30%	5%
Lab Notebook/Research Notes	25%	30%
Presentation	5%	30%

d. Final Grade Determination

The final grade is the average of the 2 semester grades. Students who fail to maintain a B average or above will be subject to the RVGS probationary policy.

III. Class Policies and Procedures

a. Absences and Tardies: The policy in the RVGS student handbook will be followed.

Absences without any parent note or contact will be consider skipping. Credit is not given for any work on days considered as skipping.

* If a student misses three or more CONSECUTIVE days, they must demonstrate evidence that the absence is due to medical, legal, or school-related reasons (doctor note, court record, or school contact). Otherwise, the absence is considered unexcused and the student loses 10% from class assignments during the absence.

b. Make-up Work: Students are expected to utilize the course Moodle site when absent to find out what assignments they need to complete for the week following. If the student has questions regarding the posted assignment, the student is to seek out his or her teacher for clarification. Students are expected to have completed the assignment for the next week even if they have missed the previous class meeting.

c. Late-work policy: Meeting deadlines is necessary for successful completion of the research project. Each student is expected to record important dates in his or her planner and appropriately use class time. To successfully complete the project, students must be independent, take initiative, and complete work outside of school. Students are expected to initiate contact with instructors if additional help is needed. Assignments may be accepted by your teacher up to seven days after the established due date. Please be aware a “day” is considered a 24-hour period and not necessarily a school day. For example, an assignment due on Friday that is turned in on Monday is three days late as opposed to one. A 10% grade reduction will be assessed per “day” that the assignment is late. A zero will be given for assignments more than seven days late. Flexibility may be granted on a case by case basis with teacher approval.

- d. **Cheating:** The policy in the RCPS student code of conduct will be followed.
- e. **Technology Policy:** The RCPS Acceptable Use Policy and the RVGS student handbook policy will be followed.
- f. **Cell phones:** The policy in the RVGS student handbook for cell phones and electronics will be followed. If parents need to contact a student during class, they should call the front office.
- g. **Extra help:** The instructors serve as facilitators for student learning. All FOR instructors are committed to helping students one-on-one when needed and are available for help with prior notice and scheduling. It is very important that you ask for extra help as soon as you start to feel overwhelmed or that you are falling behind.

Parent Vue: Grades are available through Parent Vue. The system is new for the 2018-2019 school year. For assistance with accessing your grades, please contact the school's guidance counselor. If you have questions regarding a particular grade entry, please let your teacher know as soon as possible. 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 three times during each semester (see dates on the school calendar). The interim report is a snapshot of the 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. Writing Styles:** All work in FOR will be written in accordance with the guidelines set by the Virginia Junior Academy of Sciences. All work in FOR must be typed, double-spaced, in 12-point Times New Roman font unless otherwise noted. When in doubt, refer to the VJAS handbook available online.
- ii. Laboratory Safety:** Laboratory safety is of vital importance. Each student and his/her parent will sign a lab safety rule sheet. Safety rules will be followed at all times. Attentiveness to laboratory safety rules will be incorporated into the student's grade.
- iii. Laboratory Notebook Specifications:** Each student is expected to maintain a neat, complete, and organized 3-ring binder with 7 dividers.
 1. Notes & Handouts
 - a. Reading Guides, Sample Articles, APA Information, etc.
 2. Components of Your Project
 - a. Scientific Inquiry, EDD, Problem Statement, Introduction, Literature Cited, Research Plan, etc.
 3. Statistical Notes & Practice
 4. Statistical Analysis Procedure
 5. Plant Science Project Procedure
 6. Microbiology Project Procedure
 7. Animal Science Project Procedure