Research Core – Science

2026-2027 Course Guide

Proviso Mathematics and Science Academy

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Course Introduction: Research and inquiry remain central components of the Academy experience at PMSA. Research Core – Science is designed to provide students with opportunities to explore authentic scientific, educational, medical, social, and technological issues through structured research and investigation. Students will engage in both qualitative and quantitative methods while developing skills connected to critical thinking, collaboration, academic writing, and presentation.

Throughout the course, students will learn how to identify meaningful research questions, review academic literature, collect and analyze data, and communicate findings in professional formats. Emphasis will be placed on ethical research practices, scholarly communication, and real-world application of research methodology.

The culminating experience for the course will be participation in the annual PMSA Research Symposium, where students will present their findings through formal presentations, posters, and/or capstone products.

Course Purpose: The purpose of Research Core – Science is to provide students with foundational instruction in locating, understanding, evaluating, and conducting research within an academic setting. Students will strengthen their ability to critically analyze scholarly literature while developing the skills necessary to design and complete research projects connected to their individual interests and future academic pathways.

This course is designed not only to improve research literacy, but also to encourage curiosity, independence, professionalism, and academic integrity.

Course Learning Goals

Students enrolled in this course will:

- Develop and refine research questions connected to real-world issues.
- Identify and evaluate scholarly and credible academic sources.
- Distinguish between qualitative and quantitative research methods.
- Analyze and interpret data using appropriate research practices.
- Assess the credibility, validity, and reliability of research studies.
- Evaluate research methodologies and identify limitations within studies.
- Construct organized literature reviews using academic writing standards.
- Apply ethical standards related to research and data collection.
- Collaborate effectively with peers during research activities and presentations.
- Communicate research findings clearly through written, oral, and visual formats.
- Present research professionally during symposium-style events.
- Utilize technology appropriately to support academic research and collaboration.
- Strengthen academic discussion, citation, and presentation skills.

Instructional Focus Areas

Topics explored throughout the course may include:

- Introduction to Research Design
- Quantitative vs. Qualitative Research
- Academic Literature Review
- Citation and Documentation (APA/MLA)
- Data Collection and Analysis
- Survey Design and Interview Techniques
- Ethical Research Practices
- Presentation and Symposium Development
- Scientific and Educational Research Trends
- Statistical Interpretation and Graphical Analysis
- Real-World Problem Solving Through Research

Assessment Methods

Student performance may be evaluated through a variety of measures, including:

- Research Abstracts
- Bell Ringers / Exit Slips
- Participation and Discussion
- Literature Reviews
- Research Journals
- Internet and Database Research
- Presentations and Symposium Participation
- Capstone Research Projects
- Peer Evaluations
- Quizzes and Assessments
- Homework Assignments
- Group Collaboration Activities
- Data Analysis Activities
- Professionalism and Academic Engagement
- Oral and Written Reflections

Classroom Expectations

Students are expected to:

- Arrive to class prepared and on time.
- Participate actively in discussions and collaborative activities.
- Demonstrate professionalism and respect toward peers and staff.
- Maintain consistent progress on research assignments and deadlines.
- Follow all classroom, district, and Academy expectations.
- Utilize technology responsibly and academically.
- Seek assistance when clarification or support is needed.

Research is a process that requires patience, flexibility, and persistence. Students are encouraged to take academic risks, ask thoughtful questions, and remain engaged throughout the learning process.

Academic Integrity

PMSA and the Science Department maintain high expectations regarding academic honesty and scholarly conduct. Students are expected to complete all assignments honestly and ethically.

Any instance of plagiarism, fabrication, cheating, falsification of data, unauthorized use of AI-generated work without instructor approval, or facilitation of academic dishonesty may result in disciplinary and academic consequences, including loss of credit for assignments and/or referral to administration.

Proper citation and acknowledgment of sources are required for all research-related work.

Attendance Expectations

Consistent attendance is critical to success in Research Core – Science due to the collaborative and project-based nature of the course.

Students are expected to attend all class meetings and communicate proactively regarding absences or academic concerns. Missed assignments, labs, presentations, or research checkpoints remain the responsibility of the student unless otherwise determined by the instructor. Students should regularly monitor Schoology, Teams, district communication platforms, and classroom resources for updates and assignments.

Technology Usage

Technology serves as an essential instructional tool within Research Core – Science. Students will regularly use digital resources for research, collaboration, writing, presentations, and communication.

Students are expected to:

- Use technology respectfully and responsibly.
- Engage appropriately on digital learning platforms.
- Maintain professionalism in all electronic communication.
- Avoid misuse of district technology resources.
- Follow all District 209 policies regarding acceptable use of technology.

Technology should support academic growth, collaboration, and innovation while maintaining a safe and respectful learning environment.

Final Thoughts: Research Core – Science is designed to challenge students academically while helping them develop skills that extend beyond the classroom. Through inquiry, collaboration, analysis, and presentation, students will strengthen their ability to think critically, communicate effectively, and engage meaningfully with the world around them.