



Physical Science

Yearlong Course

Dr. Ralph “Rafe” E. Spraker, Jr.

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STUDENTS OF PHYSICAL SCIENCE

6th-9th graders. Students must be able to read independently and to create notes that are organized and easy to follow. Students should be able to express themselves effectively through writing and must be capable of reviewing information and concepts on their own throughout the year outside of class. A foundation in arithmetic, including integers, fractions, and decimals, plus experience in basic algebra would be a plus.

Students enrolled in this course will complete **Quantitative Laboratory Experiments** and written reports. A parent is expected to be present during the experiments to assure safety and adherence to the laboratory protocols. The laboratory supplies and equipment need to be collected prior to conducting the experiments at home.

SCHEDULE FOR PHYSICAL SCIENCE

Course starts **Tuesday, September 6, 2022**, and will end **Thursday, May 25, 2023**.

Section	Physical Science Sessions	Eastern Standard Time
2	Mondays, Tuesdays, Thursdays	12:30 p.m. to 1:45 p.m.
	95 sessions (in 32 Weeks) on the following dates.*	
Month	#	Session Dates
September	11	6, 8, 12, 13, 15, 19, 20, 22, 26, 27, 29
October	13	3, 4, 6, 10, 11, 13, 17, 18, 20, 24, 25, 27, 31 [QII Starts]
November	10	1, 3, 7, 8, 10, 14, 15, 17, [Thanksgiving Break], 28, 29
December	7	1, 5, 6, 8, 12, 13, 15, [Christmas Break]
January	11	9, 10, 12, 16, 17, 19, [End 1 st Semester], 23, 24, 26, 30, 31
February	9	2, 6, 7, 9, 13, 14, 16, [Winter Break], 27, 28
March	13	2, 6, 7, 9, 13, 14, 16, 20, 21, 23, 27 [QIV Starts], 28, 30
April	9	[Holy Week], 10, 11, 13, 17, 18, 20, 24, 25, 27
May	12	1, 2, 4, 8, 9, 11, 15, 16, 18, 22, 23, 25, [End 2 nd Semester]
Total Sessions:	95	

These are anticipated dates for this course. However, they are **subject to change as Dr. Spraker’s circumstances might dictate (e.g., family emergency). Session(s) canceled will be rescheduled at an alternate time **designated by Dr. Spraker**.*

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CONTENT MAP FOR PHYSICAL SCIENCE

First Quarter (September 5th - October 28th)

Matter and Atoms

Sources of Energy

Conservation of Energy

Second Quarter (October 31st - January 19th)

Order and Design in Nature

Forces and Fields

Substances

Third Quarter (January 23rd - March 23rd)

Science, Theories, and Truth

Measurement and Units

Properties of Substances

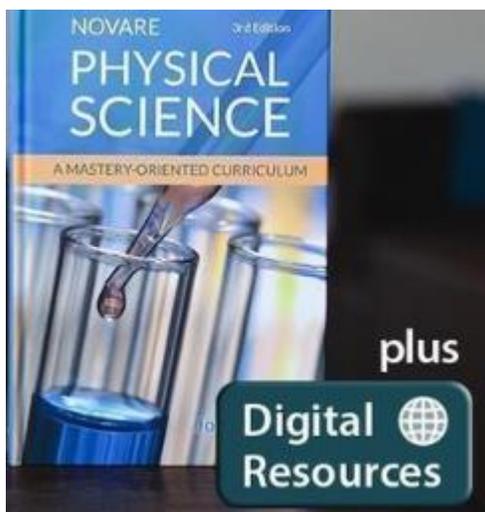
Fourth Quarter (March 27th - May 25th)

Forces and Fields

Compounds and Chemical Reactions

Waves Sound, and Light

REQUIRED MATERIALS FOR PHYSICAL SCIENCE



Physical Science Program

π Microsoft **Word**, **PowerPoint**, and **Excel**, Printer with scanner, and Scientific Calculator.

π Binder with 2 x 2 graph paper and notebook paper.

π Colored pencils and pens, erasers, index cards, metric ruler, and protractor.

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COURSE DESCRIPTION FOR PHYSICAL SCIENCE

Preparedness: Physical Science is for Middle Schoolers or Freshmen. The course utilizes manipulations of equations, unit conversions, exponents, fractions, ratios, percentage, and proportions. Students are also expected to read the text, take notes, and write in full sentences.

Content: Twelve modules of the course text, *Physical Science* by John D. Mays, 3rd Ed., will be used to cover: Scientific knowledge; Measurement; Matter, Atoms, Substances, Compounds, and their properties; Energy and its Conservation, Forces, Motion, Waves, Sound, and Light.

Mastery: In order to prepare students for upper-level high school Natural Philosophy courses, this course uses a mastery approach. This is achieved by covering fewer concepts at a deeper level. Our goal is to have a solid, working comprehension of these concepts and to apply the mathematical calculations accompanying them. Mastering these concepts now will create a tremendous foundation upon which higher level concepts can be built in Biology, Chemistry, and Introductory Physics. Regular review of important “standard problems” throughout the year will keep concepts relevant and fresh. Students will be expected to keep up with the daily workload of reading the text, taking notes, attending class, completing the practice problems, and reviewing older material (easier as good skills and habits are developed).

Integration: This course approaches Natural Philosophy holistically, integrating history, mathematics, English language, and epistemology.

Laboratory: A good observer understands that well-designed experimentation, proper interpretation of results, and precise communication of findings is part of repeatability. **Quantitative Laboratory Experiments** will be conducted during the course using Microsoft Word, PowerPoint, and Excel.

NOTE: Parents are expected to be present during home laboratory exercises to ensure the safety of their student and the following of proper procedure. Together they will pre-read the exercise and set up supplies and equipment prior to their Lab Time.

Grading: The course grade is based on cumulative assessments, completion of homework and written laboratory reports. Self-checking, and regular review of past material will ensure earning **Cum Laude** or **Magna Cum Laude**.

Goals for My Students: That they would grow in their love of God’s orderliness and beauty in His “**OPERA DIGITORUM**” (i.e., “**The Work of Your Fingers,**” Psalm 8: 3) all around us as they gain understanding and confidence in foundations of Natural Philosophy to carry them forward on their path of learning.

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PARENT EXPECTATIONS IN ACTION

The expectations of parents are that they will ensure that their student has all required materials needed for the course, a stable internet connection, a distraction-free environment for class sessions, and adequate time to study and complete assigned work outside of class sessions. Parent assistance with assignments is not expected nor required. If your student is struggling with an assignment and asks for help, I would encourage parents to honor their student's initiative and provide help.

STUDENT EXPECTATIONS EXECUTIVE FUNCTION SKILLS

In this class, students will be expected to show development of **Executive Function Skills** throughout the year. **Executive Function Skills** are qualities and skill sets that the student can develop and hone to better approach the courses, lectures, readings, and teachers they will encounter in their journey as a student. Students in this class should exhibit the following **Executive Function Skills** throughout the year.

Engagement: The student views class sessions as opportunities to learn and be in fellowship with the instructor and classmates. He is polite and attentive during class sessions, listens actively when others are speaking, and supplies answers, asks questions, and participates in class discussions. The student keeps his video on and stays focused on viewing the **Zoom** screen (not distracted by other screens).

Self-Control: The student raises his hand during class, speaks when called on to do so (and not out of turn), remains on-task, and shares relevant questions, comments, and ideas. He resists temptations to view other screens or use other devices, play games, work on other schoolwork or activities, or distract the instructor and classmates with disruptive behaviors.

Responsibility: The student completes and submits all assignments by the due date, arrives on time to all class sessions, regularly checks the syllabus and **Schoolology** page for class information and updates, communicates with the instructor promptly with questions and requests for help, and makes use of offered resources. As the student grows in responsibility, our goal would be that he is able to learn and complete assigned work with independence.

Initiative: The student thinks about his own learning and discerns whether he understands the lesson or topic. He receives instructor feedback humbly and applies it to future assignments. The student actively communicates with the instructor (and/or parents) to seek help and ask questions if necessary. He strives to take ownership of his own learning.

The four skill sets listed above are general **Executive Function Skills** that align closely with Student Virtues. Additionally, students will also practice the important skill of taking notes**, which may or may not have been expected of them in past classes or lessons. Since some students may have little or no experience with taking notes, we will incorporate instruction in notetaking.

**** Notetaking:** The student will learn to discern important information, vocabulary, and example problems to write down for future review and study. He will also learn to finish his notes after a lesson and to write down his own thoughts and questions for later class sessions, independent study, or meetings with the instructor. This skill set will be expected in higher-level courses.

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STUDENT EXPECTATIONS IN ACTION

The instructor will facilitate learning and will provide plentiful opportunities for practice and growth in our topics of study. It is ultimately the student's responsibility to be an active learner both in and out of the class sessions. The student must stay up to date with assignments and take initiative to ask the instructor and/or parents for help when it is needed.

The student is expected to:

- π Arrive on time to class sessions with required materials.
- π Attend the entire class with his video on.
- π Listen attentively.
- π Participate **actively** in class sessions – Including presenting problems, sharing methods or strategies for solving problems, reviewing answers, posing questions, explaining, and justifying answers, and thinking out loud.
- π Embrace mistakes as opportunities to learn.
- π Seek approved help if struggling with lessons or assignments.
- π Use technology (e.g., calculators) as approved by instructor to complete assignments.
- π Complete and submit all assignments by the due date.

A student who has not completed assigned work prior to the start of a class session will not be well-prepared to learn or participate in the lesson. For a lower-school student, this could lead to frustration in the learning process and result in an overwhelming “pile-up” of homework. If there are extenuating circumstances that prevent the student from completing an assignment, parents should contact the instructor via email prior to the class session to request an extension.

Students will submit their work by **scanning** their assignment pages to PDF and uploading them to the **Schoology** assignment window. **Photographs of completed assignments will NOT be accepted as they are incredibly difficult to read.**

STUDENT EVALUATION: GRADING

Students work alongside the instructor as they learn and grow in their understanding of **Physical Science**, and grades allow the instructor to communicate in a consistent manner with students about their level of mastery. Even more important than a specific grade are the comments and feedback in response to students' methods, solutions, errors, and thought processes on a given assignment. Grades give a reflection of students' levels of mastery, but comments and feedback allow students the opportunity to continue growing in knowledge and skill. As it is our goal to pursue restful learning in **Physical Science**, yet also provide clear, consistent messages about the level of a student's mastery, a **Mastery Grade Scale** will be used to communicate grades for assignments and for the overall course. The **Mastery Grade Scale** is as follows:

- π **Master**: a student whose work shows mastery of the material will earn this grade.
- π **Journeyman**: a student whose work shows that he is approaching mastery of the material will earn this grade. This grade is considered satisfactory, but the student will be encouraged to continue working on the knowledge and skills assessed on this assignment.
- π **Apprentice**: a student who needs to spend more time studying and learning the content will earn this grade.

The student will be encouraged to re-work the assignment and may be provided with additional practice as needed. Inasmuch as you might be fully on board with this grading scale in theory, there may be a need to complete a transcript with either a numeric or traditional letter grade. Traditional percentage grades will be provided upon request. **Dr. Spraker** will provide a transcript of that grade to the requesting parent at the **end of the year**.

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STUDENT EVALUATION: TYPES AND WEIGHTS OF ASSIGNMENTS

Dr. Spraker will communicate with students regarding assignment feedback and grading through the **Schoology Learning Management System**. A student's grades will be comprised of:

1. **Assessments:** 70% of grade.
2. **Homework Completion:** 20% of grade.
3. **Written Laboratory Reports:** 10% of grade.

All assignments are due to the appropriate **Schoology** assignment folder by Midnight of the due date. If there are extenuating circumstances that prevent a student from completing a homework assignment prior to class, a parent must contact the instructor prior to class time to ask for an extension.

Students and parents should understand that *normally* assignments turned in late will earn a **10%** penalty. Assignments turned in more than one week past the assigned due date *normally would* not be awarded credit, nor would they be corrected.

STUDENT EVALUATION: ACADEMIC DISHONESTY

Students will often complete assessment tests and/or quizzes privately at home. Students are on their honor to abide by **Scholé Academy's Learning Philosophy** which assumes the personal cultivation of Student Virtues described in the ***Student-Parent Handbook***.

Unless otherwise noted, all assignments are to be completed without the use of outside materials. Additionally, plagiarism and the use of homework websites/apps is a serious and punishable offense. Any assignment found to be completed dishonestly will result in a failing grade.

THE VIRTUAL CLASSROOM

We will be using the free online "virtual classroom" software provided by **Zoom**, one of the leading companies that provides such software. The virtual classroom will provide students with interactive audio in which text, diagrams, video, and other media can be displayed and analyzed. We will provide students with a link (to be sent via email and posted on the **Schoology** page) that will enable students to join the virtual classroom.

We will also be using the **Schoology Learning Management System** where students will find course information and assignments, communicate with the instructor, and upload and submit assignments. Students will use scanning technology/apps (like ClearScan) to create single-file PDFs of completed assignments to submit through **Schoology**.

Specific information regarding the technology used by Scholé Academy (including required technology) can be found by visiting the **Technology in the Classroom** section of the ***Student Parent Handbook***.

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ABOUT THE INSTRUCTOR:



Greetings **Physical Science** students, from glacially-formed **Lake Louise** in **Banff National Park**, Alberta, Canada (on left above). Notice all three states (ice, mist, and liquid) of water are in the picture!

I'm **Dr. Ralph "Rafe" E. Spraker, Jr.** and I look forward to interacting with each of you! I maintain a two-mile segment of the **Mountains to the Sea Trail** from the "**Raven Rock**" [**BRP Milepost 290** see above right] to the "**Aho Gap**" [**BRP Milepost 288**, Elevation 3722] which parallels the **Blue Ridge Parkway** near my home in Boone, NC.

I earned: my **Ph.D.** from the **University of South Carolina** (2010); 3 Master's degrees including an **MSSE** from **Montana State University, Bozeman** (2011); and my Bachelor's degree from **BIOLA University** (1983). My cognates include: **BioLogica**: Biochemistry, Molecular and Systems Biology; **MatheMatica**: Information Technology, Mathematics, and Physics; And **GeoLogica**: Astronomy, Geochemistry, Geophysics, Hydrology, and Physical Geography. I currently teach **Physics** for **Southern New Hampshire University** and **Ohio Christian University**.

I enjoy studying Lutheran and Patristic theology (Solus Christus) and Revolutionary War history [I just finished Chernov's *Hamilton* and *George Washington: A Life*].

In the Lamb,
Dr. Rafe Spraker

QUIA LEX PER MOSEN DATA EST
GRATIA ET VERITAS PER IESUM CHRISTUM FACTA EST
IOANNES I : XVII