

Physical Science 2nd Edition Lesson Plan – Revised March 2008

Grade 9 Science

Text: **Exploring Creation with Physical Science 2nd Edition** (PS); by Dr. Jay L. Wile;
Apologia Educational Ministries; ©2007.

Key: **Solutions and Tests for Exploring Creation with Physical Science** (ST); by Dr. Jay L. Wile.

About the Text: **Exploring Creation with Physical Science 2nd Edition** is an introductory Physical Science course designed to take the high school student through a study of the physical properties of matter of which the world and the universe is composed. The forces acting upon Creation, along with the laws of science and nature by which those forces are governed, will be discussed as well. Beginning with an in-depth look at the minuscule world of the atom, the text goes on to cover the world around us, and eventually even the universe. The properties of waves and sound, light, and an introduction to astrophysics rounds out the course.

About the Author: Dr. Jay L. Wile is a scientist who writes science texts specifically for home-schooled students. From a reading of his texts, it is clear that he believes that there is a design in nature, in the world and universe around us, and that the Designer is Almighty God, the Creator of everything seen and unseen. Dr. Wile holds an earned Ph.D. in nuclear chemistry from the University of Rochester. His teaching credits include the University of Rochester, Indiana University, the Indiana Academy for Science, Mathematics, and Humanities, and Ball State University. Dr. Wile has published more than 30 scientific articles on the peer-reviewed journals of his field and has lectured extensively on Christian Apologetics and Creation/Evolution Debate. He is currently the senior Programmer/Analyst at Indiana's premiere medical laboratory, Pathologists Associated. Our Lady of Victory School has talked with Dr. Wile on numerous occasions. He is not a Roman Catholic, but he is a good-willed Christian man whose love of God and search for Truth are clearly evinced in his writing. In **Exploring Creation with Physical Science**, the only point with which Catholics might take issue is a brief digression by Dr. Wile into the Galileo controversy. Dr. Wile readily pointed this out to OLVS, and we have given you, our home-schooling families, some background information with which to better understand the whole issue (see p. 3 of this lesson plan). Dr. Wile is affable and very approachable, and can be reached by the means listed on the "Need Help?" page of the text, just opposite the copyright page.

Assignments and Tests:

Assignments for **Exploring Creation with Physical Science** will consist of reading from the texts, as well as written responses to:

- the "On Your Own" problems interspersed throughout the text of each module; and
- each end-of-module Study Guide.

Additionally, there are experiments placed throughout each module, and assigned in the lesson plan. Material requirements for these experiments are listed on Student Notes pages (pp.) iii through ix of the text. **Ensure that you read the section on "Experiments" on p. vi of the Student Notes in the text, especially the comments on safety precautions while conducting**

experiments. OLVS heartily concurs with Dr. Wile’s recommendation in the “Experiments” section of the Student Notes on p. ii of the text that the student keep a log or notebook of the experiments. The keeping of a log assists the student in working through the scientific concepts embodied in the experiment in an orderly fashion. On p. 4 of this Lesson Plan, you will find a sample Lab Log Book entry. Ensure that the student keeps notes on experiments which he conducts, along the lines of the sample given. Since the student will be required to periodically submit a log book entry, and since spiral bound notebooks are the most convenient log books to use, photocopies may be sent to the OLVS tutor when the log book entry is requested in the Lesson Plan. The student should develop good skills of observation and record keeping, since he will be required to keep detailed lab notes in 10th and 11th Grades for Biology and Chemistry, respectively. Again in future years, the student will be required to submit notes containing observations and conclusions from those labs.

On p. i of the Student Notes of the text, the author, Dr. Wile, gives some guidance for the student to pace himself through the text in the section entitled “Pedagogy of the Text.” Our Lady of Victory School uses a 38-week academic year, and as a result, the schedule suggested by Dr. Wile has been modified somewhat to accommodate the OLVS schedule.

Answers for the “On Your Own” problems placed throughout each module can be found immediately following the module in which the questions appear. Answers for the Study Guide questions, which appear at the end of each module as a means of review and reinforcement of the most significant concepts covered in that module, are to be found in the Solutions and Tests for Exploring Creation With Physical Science.

Students should remember to always answer the “On Your Own” problems and the “Study Guide” questions fully, in complete sentences, and to show all work when it requires some mathematical computation. Parents, please use the EZ Grader, when necessary, for finding grades of assignments, and fill in each grade in the corresponding space to the right on the appropriate page of this lesson plan.

There will be a test after each module. These 16 Module Tests may be found in the Solutions and Tests for Exploring Creation With Physical Science. Students will be readily able to answer the questions on the Module Tests if they have mastered the “On Your Own” problems and “Study Guide” questions for each module. There are also Quarterly Tests, which can be found at the end of each quarter in this Lesson Plan. Four modules will be covered each quarter. Each quarter test covers only material from its respective quarter only. They are comprehensive only insofar as they cover the all the content of the four modules covered in that particular quarter. It is recommended that you make copies of all your “On Your Own” written assignments and Module Test answers, to be used for study aides in preparation for the tests, since these will not be returned to you by the OLVS tutor until after you have submitted the Quarterly Test. **Again, we strongly suggest that you keep your own notebook of lab observations, conclusions, and important facts for review for quarterly tests.**

****REMEMBER, ANSWER ALL QUESTIONS FULLY
AND IN COMPLETE SENTENCES****

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For the Record:

Copernicus, Galileo, and Geocentrism

Exploring Creation with Physical Science is, in our opinion, the finest high school introductory physical science text available in print. In our talks with the author, Dr. Jay L. Wile, we have been impressed with his credentials, his scholarship, his even-handed writing, and his good will.

Unfortunately, Dr. Wile, who is not a Roman Catholic, has presented a somewhat erroneous and one-sided account of the Geocentrism (earth-centered solar system) debate which involved the Office of the Inquisition and its pronouncements upon the work and teachings of Copernicus and Galileo. It does not detract significantly from an otherwise excellent text, but because we have incorporated this text into our curriculum, Our Lady of Victory is duty-bound to set the record straight regarding this issue. It is of significance, we think, that in our discussions with Dr. Wile we advised him that we would publish disclaimers such as this one where we deemed it necessary. He understood and interposed no objection to our doing so.

On pages 279 - 280, the author implies that it was the Roman Catholic Church that raised objections to the work of Copernicus during his lifetime, and that “Copernicus was excommunicated for his work.” In the 1913 edition of the *Catholic Encyclopedia*, however, there is absolutely no mention of Copernicus having been excommunicated, and when he died in 1543, he did so in the bosom of Holy Mother Church, having been thwarted by the Protestant arch-heretics Luther and Melancthon – who controlled the printing presses in Wittenberg where the works were being printed – from having his works published as he originally wrote them. In the entry on “Copernicus” in the 1913 Knights of Columbus edition of the *Catholic Encyclopedia*, we read:

Opposition was first raised against the Copernican system by Protestant theologians for Biblical reasons, and strange to say it has continued, at least sporadically, to our own days. . . . On the Catholic side, opposition only commenced seventy-three years later, when it was occasioned by Galileo.

During the Galileo controversy, the works of Copernicus were forbidden by the Congregation of the Index, when Galileo challenged the ecclesiastical authorities of his time. The proofs which Galileo adduced in support of the heliocentric (sun-centered) system of Copernicus, as opposed to the geocentric model of Ptolemy to which many 17th century Churchmen adhered, were far from conclusive. Great scientists of his time such as Tycho Brahé and Lord Bacon remained unbelievers; but Galileo pushed the issue by attempting to convince all around him of the truth of his cause. His arrogance raised the ire of influential theologians and prelates at the time, and he was put on trial and condemned in 1616. Galileo promised to discontinue teaching the heliocentric model of the solar system, a promise he immediately broke upon his return to his native Florence.

Placed on trial again in 1632, he boldly denied that he had broken his earlier promise, and he was again condemned and this time placed under house arrest in Rome. Galileo’s Protestant biographer, von Gebler, tells us that during the trial he had the run of the “commodious apartment of an official of the Inquisition,” and that he spent those last ten years of his life (he died in 1642) in comfort and luxury, though he did go blind five years before his death. Galileo’s good friend and benefactor, Pope Urban VIII, allowed him to be interred not only in consecrated ground, but within the church of Santa Croce in Florence.

That the Church did not consider this a *de fide* issue concerning infallible teaching is clear from the fact that the Holy Father intentionally did not sign the condemnation of Copernicanism at the second trial. In fact, Doctor of the Church and Saint, Robert Cardinal Bellarmine, who was the prosecutor at the first trial of Galileo, had this to say of the whole matter:

I say that if a real proof be found that the sun is fixed and does not revolve round the earth, but the earth round the sun, then it will be necessary, very carefully, to proceed to the explanation of the passages of Scripture which appear to be contrary, and we should rather say that we have misunderstood those than pronounce that to be false which is demonstrated.

The inaccuracies in the textbook reinforce this axiom: that when anyone who is not a qualified Catholic theologian attempts to give us the Church’s position on a subject by saying “the Roman Catholic Church. . . ,” followed by some assertion, we should be wary. Such assertions often belie a fundamental misunderstanding of ecclesiology, papal or magisterial infallibility, and the differences between doctrine/dogma and discipline.

SAMPLE LAB LOG BOOK ENTRY

[Student Name]
Our Lady of Victory School
Grade 9
Physical Science Lab Notebook

Lab: Experiment 1.1, pp. 1 - 3, *Exploring Creation With Physical Science*

Materials:

Small glass	9-volt battery
Baking soda	Two pieces of insulated copper wire
Tap water	Scissors
Tape	

Preparation: I filled the glass about $\frac{3}{4}$ full of tap water, and added a teaspoon of baking soda, stirring until all the baking soda appeared to be dissolved. I prepared the two pieces of wire by stripping the insulation from both ends of each. I then attached one end of each wire to a terminal on the battery. It was difficult to get good contact, even with tape. (In future, should I need to use a 9-volt battery, I will purchase an adapter from an educational or radio supply store.) I immersed the other ends of the wires into the glass filled with the water/baking soda solution.

Observations: Immediately upon placing the wires into the solution, I noticed that small bubbles began to form around the bare ends of both wires. I let the experiment run for about ten minutes. After that, when I pulled the wires from the solution, I noticed that on the bare part of the wire that had been connected to the battery's positive terminal, a bluish-green substance had formed.

Conclusions: The bubbling of the water must have been caused by the electrical current breaking down the liquid into gases, which then escaped to the atmosphere. I don't know exactly how this occurs; but I want to research some more to see what causes this. I ran the experiment again, using only water, instead of a baking soda solution. No bluish-green substance formed, which leads me to believe that the bluish-green substance that formed on the wire connected to the positive terminal must be the result of the copper reacting with the elements found in the baking soda.

SAMPLE

PARENTS/TUTORS - PLEASE NOTE:

**There are answers in the back portion
of the
Physical Science Solutions Manual.**

**Please monitor all testing so that the
student will not be tempted to cheat.**

**Answers that match the answer key
(word for word) will receive '0' credit.**

