

Tree of Life School

*"Wisdom is a tree of life to those to those who embrace her."
Proverbs 3:18*

Physical Science Course Outline

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Course Outline

Introduction

This course is a general introduction to Physical Science, the study of the non-living physical natural world as created by God. The subjects of this course will cover matter and energy, heat, forces and motion, the earth and space, rocks, water and air, and weather. Generally, this course serves as an entry point into further studies in chemistry and physics. This course will present many new words and definitions, but also key concepts and ideas about current issues and the limitations of science. The variety of assignments and tests will focus on memory of factual information as well as understanding of concepts, practical experiments, research, and writing. The goal of this course is to introduce the student to the language and systematic study of the physical world as well as to instill an appreciation and wonder of God's creation.

How to Work Through The Course

This course has been divided into a **140 day schedule**. This will allow the student to follow a **four-day school week** and still complete the course in a normal academic year. The **fifth day** of each week can be used to **catch up on assignments**, do **extra reading**, or simply **take the day off** from the course. If, however, a five-day school week is more desirable, the student is encouraged to pursue this course and will be rewarded by early completion of the material. Care has been taken to provide specific instructions for each day's work. Therefore, **all work is to be completed in the order presented in the daily schedule**.

The guide provides a suggested day-by-day sequence of lessons that will pace you through the reading material, experiments, assignments, and tests. This course uses the textbook *Exploring Creation with Physical Science* by Jay Wile, but the textbook is not itself the course, but only the main reading source you will use as you study the science. This course guide offers important suggestions over the next few pages on **how to study this course** as well as comments and tips throughout the 140 day plan. The beginning of the textbook also describes how the textbook should be used during study.

Calculating Your Final Grade

During this Physical Science course, you will complete 10 assignments and 6 tests. Every module (chapter) of the course has either an assignment or a test to send for marking. **Please note that Tree of Life doesn't use the test package that comes with your textbook.** Your final mark in the course will be based on the following percentages:

10 Assignments	50%
6 Tests	50%

How To Study Physical Science

Reading and Note-Taking

The backbone of the course is the textbook, which poses questions and provides scientific information and discussion in a very understandable and conversational tone. However, simply reading the textbook will yield little learning if there is no critical interaction with the material. One does not read science as one reads novels. Some people can read novels very quickly. But for science, you must slow down and sometimes read every word in the sentence to understand the concept. You might need to look back and forth five times between a diagram and a paragraph you are reading in order to “connect the dots”. This type of careful reading is necessary for learning science.

One very important learning method you should employ for this and following science courses is **note-taking** or **reading notes**. When reading a section of the textbook, you should always have at your side a notebook used for recording important terminology, definitions, explanations, facts, diagrams, and illustrations. The best time to write down notes is the moment your mind is on them. The purpose of reading notes is threefold. First, the act of note-taking forces you to think about what are the most important things in what is being said – that’s what to write down. Second, good notes give you a quick reference to the most important information from the textbook. You can find the main points more easily when studying for the test. Thirdly, as in the case of copying diagrams, note-taking causes you to look carefully and think harder about what you are looking at. If you take good notes while reading, you might accumulate 2-3 pages per module (not including your answers to practise questions).

How to use this Study Guide

This study guide is intended to provide a sequence of learning steps to pace you through the course. Each day gives a suggested number of pages for reading, practise questions, experiments, and tips. Some days will require more time and work; in this case, take an extra day if you need. If you are able to move faster, that’s fine too. However, good study habits are still important to develop, so following every lesson step is recommended. A good memory for terminology and concepts in science only goes so far, and a failure to develop study methods will eventually make learning harder or less enjoyable.

A few other tips and notes...

- You should always check the answers to the practise questions (“On Your Own” questions); the answers are at the end of the module. Don’t “peek” if you aren’t sure of an answer; give your honest effort first, then check afterwards.
- It is a good idea to review the materials required for different experiments **before** the day of the lab. That way, you can be prepared. It is very important to pre-read the entire procedure for the experiment before you start.

Why do experiments?

The experiments in this course are very important to do for several reasons. First, many experiments can help turn abstract scientific concepts into observable events and memorable pictures in your mind that help develop understanding. Another reason for the experiments is that they are fun and sometimes entertaining! They give variety to the course. Thirdly, experiments are an important activity of working scientists who make hypotheses about their observations in nature, and then set out to test their predictions within controlled conditions. Although you must learn the foundations of science before practicing like real scientists, the kind of experiments in this course emulate the same thinking processes in natural science.

Module 1 - The Basics

This chapter introduces the course and focuses on scientific measurement. You will practise important mathematical skills involving metric units, conversions, and simple calculations used in science. Such skills will also be applied in later parts of this course. Your first assignment is based on these numerical skills

Key terms: atom, molecule, element, compound, mass, volume, concentration.

Day 1 - Read pages 1-3. Carefully read and follow the instructions for **Experiment 1.1**. Record your observations in a notebook. You might want to make a quick diagram showing what you saw.

Day 2 - Write 1-2 sentences in your notebook explaining what you think Experiment 1.1 tells us about Atoms and Molecules. Read pages 3-7. Make sure you understand the difference between atoms and molecules, as well as examples of each. **Complete questions 1.1 and 1.2** (page 6) in your notebook.

Day 3 - You will see that numbers are very important in science because they allow us to accurately compare and make conclusions about things in nature. Read pages 7-11. Copy Tables 1.1 and 1.2 into your notebook, as well as any other important information about scientific measurement. Practise: Study Guide questions 1-6 (end of module).

Day 4 - Read pages 11-14. Follow the example calculations very carefully and make sure you understand every step. You should copy them into your notebook. **Answer questions 1.3, 1.4, and 1.5** in your notebook. Make sure you show all units and cancel (cross out) units as you go. Check answers at the end of module.

Day 5 - Read pages 14-17. Copy Table 1.3 into your notebook. **Answer questions 1.6, 1.7, and 1.8** in your notebook. Again, make sure you show each calculation completely. Check answers at the end of module. Experiment 1.2 is optional.

Day 6 - Complete **Experiment 1.3** on Concentration. Record your detailed observations in your notebook. Illustrations would be helpful. Practise: Study Guide questions 7-11. **Start Assignment 1**.

Day 7 - Write 1-2 sentences in your notebook explaining what you think Experiment 1.3 tells us about concentration. How does the concentration of vinegar affect the nature of the chemical reaction? Read pages 18-20. **Answer questions 1.9 and 1.10** in your notebook. Check answers at the end of the module.

Day 8 - Practise: Study Guide questions 12-14. **Complete Assignment 1** and submit it by mail or email. See the Student Handbook for instructions on submitting assignments.

Tree of Life School
Physical Science

Assignment	Test	Description	Mark
1		Calculations assignment	
2		Lab Report (module 2)	
	1	Module 2/3 Test	
3		Lab Report (module 4)	
	2	Module 4/5 Test	
4		Lab Report (module 6)	
5		Research Assignment	
	3	Module 7/8 Test	
6		Calculations assignment	
7		Lab Report (module 10)	
	4	Module 9/10/11 Test	
8		Lab Report (module 12)	
	5	Module 12/13 Test	
9		Lab Report (module 14)	
10		Lab Report (module 15)	
	6	Module 14/15/16 Test	
		Assignments (50%)	
		Tests (50%)	
		Final Mark	