Subject: **Physical Science**
Required Course: **1 Unit**
Instructor: **Mark Joachim**
Text: **Glencoe/McGraw-Hill**

Course Description: Students will be able to take terms from Physical Science and apply them to their everyday living. Students will be able to read the Periodic Table, and to understand scientific laws and be able to do problems.

Topics include:

1. Energy and Motion
2. Electricity and Energy Resources
3. Energy on the Move
4. The Nature of Matter
5. Diversity of Matter
6. Interactions of Matter

Instructional Philosophy and Instructional Delivery Plan:

1. Instruction will be in the form of lectures, research, hands-on labs, presentations and special projects.
2. Students will work independently, with partners, and in small groups.
3. Students will be responsible for submitting completed assignments and projects in a timely manner.

Course Objectives/Goals:

This Physical Science course will provide a knowledge and understanding of appropriate concepts, processes, values and skills in Physical Science by teaching:

1. Students to acquire basic habits of critical thinking.
2. To learn scientific terms, concepts, and principles.
3. So that students will sustain and enhance their natural curiosity.
4. To instill an appreciation for their natural environment.
5. To relate the learned Physical Science concepts to the understanding of practical applications in their everyday life.
6. To perform experiments to help them to understand the how and the why of science.
7. Demonstrate appropriate laboratory techniques and safe use of equipment and chemicals, while working as lab partners or individuals.
8. Lab safety is taught, and the student indicating that they have read the rules, understand the rules, and will abide by the rules signs a form.

Major Course Projects:

Students will have special projects that they will work on through out each nine weeks period. Special projects will include research papers, a Science Fair Project, weekly journal of science in the news,.

Course Assessment:

Evaluation will be done by: homework exercises and problems, lab exercises, teacher made and standardized tests, quizzes, lab safety and procedure, and cooperation and respect for teachers, classmates, and equipment in the classroom. Students will receive a passing grade if their average is 70% or better.

Homework and Reports 30%, Quizzes and Labs 30%, and Tests 40%.

Grading Scale:

A+ 100-99	B+ 93 – 92	C+ 86 - 84	D+ 76 - 75	F 69-0
A 98-97-96	B 91-90-89	C 83-82-81-80	D 74 - 73 -72	
A- 95-94	B- 88 – 87	C- 79 - 77	D- 71 –7 0	

GRADES 9-12 PHYSICAL SCIENCE STANDARDS

STUDENTS WILL:

1. relate macroscopic and microscopic characteristics of the four states of matter.
2. differentiate between physical and chemical properties used to describe matter.
3. trace the changing model of the atom. (example: the Bohr to the wave-mechanical model)
4. use the periodic table to determine reactivity, to write formulas, to identify types of compounds formed, and to determine valence and oxidation number.
5. analyze how placement of elements on the periodic table is a function of atomic structure.
6. explain characteristics of atoms and of relationships that exist among them.
7. compare characteristics of isotopes of the same element.
8. analyze different types of stoichiometric relationships.
9. differentiate between acids and bases.
10. compare the roles of electrons in covalent, ionic, and metallic bonding.
11. describe factors that affect reaction rates including temperature, concentration, surface area, and catalysts.
12. apply calorimetry to investigate heat of reaction.
13. analyze the properties and interactions of acids, bases, and salts.
14. describe factors that affect solubility and rate of solution. (example: nature of solute and solvent, temperature, agitation, surface area, pressure of gases)
15. analyze energy transfer as matter changes from one form to another.
16. analyze physical and chemical processes involving atoms, molecules, and ions that result in endothermic and exothermic changes.
17. explain how molar quantities are changed based upon the intended chemical reaction.
18. analyze how phases of matter are explained by kinetic theory and by forces of attraction between particles.
19. apply the kinetic molecular theory to solve quantitative problems involving pressure, volume, and temperature in ideal gases.
20. use models to make predictions about chemical bonds, chemical reactivity, and polarity of molecules.
21. demonstrate the relationships between force and motion in Newton's laws.
22. solve graphically and analytically vector problems related to force.
23. relate gravitational or centripetal force to projectile or uniform circular motion.
24. apply quantitative relationships among mass, velocity, force, and momentum.
25. apply the quantitative relationships among force, distance, work, time, and power to solve problems or to describe situations.
26. explain how extremely large and extremely small quantities and very rapidly moving objects are not necessarily described by the same laws that Newtonian physics describe.
27. explain the sources of intramolecular and intermolecular forces in matter.
28. calculate the force on a charged particle at rest and/or in motion.
29. determine if an object is in equilibrium and distinguish among stable, neutral and unstable equilibria.
30. describe mathematically the relationships among potential energy, kinetic energy, and work.
31. describe how energy can be transferred and transformed to produce useful work and to calculate the efficiency of selected systems.
32. explain methods of heat transfer. (example: conduction, radiation, convection)
33. relate conservation of matter and energy to the flow of energy through food webs.
34. describe the use of isotopic dating in determining the age of fossils.
35. interpret wave phenomena using models of transverse and longitudinal waves.
36. analyze the different frequencies and wavelengths in the electromagnetic spectrum.
37. investigate how light behaves in the fundamental processes of reflection, refraction, and image formation. (example: manipulate prisms, mirrors, lenses)
38. use single and multiple slits and diffraction gratings to demonstrate the wave properties of light.