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CHECK assignments/grades on my website-

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PHYSICAL SCIENCE WITH MR.BILITZ

CLASS SUPPLIES:

Textbook – Physical Science: Science Spectrum, Holt, Rinehart and Winston (must be covered)

Three-ring-binder -

3 dividers (these are for notes, homework, labs and projects)

lined paper/or notebook

Scientific Calculator, preferably a Texas Instrument

COURSE PURPOSE: To introduce students to the exciting world of science which God has created, and give them a solid scientific background so they will be able to function in today's rapidly changing world.

COURSE OUTCOMES:

1. Demonstrate an understanding of God's plan for science in our lives by differentiating between relative science truths and God's absolute truth. (Ch. 1, Bible)
2. Incorporate accepted scientific-mathematical procedures to evaluate and justify relationships within science processes.(Ch. 1,2)
3. Identify characteristics of motion, relate how forces affect motion, and perform demonstrations, which justify their relationships. (Ch. 10,11)
4. Identify types of energy and relate energy conversions, conservation, and transfer to matter in real life situations. (Ch. 12,13)
5. Identify components of machines and design, construct, and perform demonstrations to justify mathematical equivalencies. (Ch. 12)
6. Describe and label characteristics of waves and predict wave interaction. (Ch. 14, 15)
7. Show a working knowledge of Ohm's law by designing, predicting, constructing, and evaluating outcomes of a said circuit. (Ch. 16)
8. Use the Periodic Table to recognize trends and predict characteristics of elements and chemical bonding. (Ch. 4-8)
9. Create working models of atoms, machines and heating systems, and present them in class. (Ch. 4, 12, 13)
10. Incorporate technology in designing and presenting information, gained through research. (throughout text)

COURSE OUTLINE:

QUARTER 1(3): Chapters 1,2,3,4

Physical Science Basics

QUARTER 2(4): Chapters 4,5,6,7

Interactions of Matter

A variety of instructional techniques will be used in this class. They will include, but not be limited to, discussion (25%), group work (5%), projects(5%), laboratories (25%), and the use of demonstrations(5%), overheads (25%), power point presentations(5%) and videos(5%).

CLASSROOM EXPECTATIONS:

1. Attendance: It is extremely important that you attend class every day. You will not lose points for absences, but missing class will definitely affect your grade.
2. Make-up Work:
 - a. If you miss a lab you will have one week to make it up at the teacher's discretion. Notify me early if possible.
 - b. If you miss an assignment or test you will have one school day plus the number of days you were absent to make it up.
 - c. If you miss notes you should see Mr. Bilitz or a fellow classmate about getting them.
 - d. Late work will not be tolerated more than one time a quarter. The second late assignment will be an automatic F (50% or lower), and will drastically affect the final grade.

*****YOU MAY NOT MAKE UP ANY WORK IF YOUR ABSENCE IS UNEXCUSED!!!**
3. Tardies: You must be *in the room* when the bell rings, and please be in your seat as well. Penalties will follow according to school policy.
4. Plagiarism: You are responsible for your own work! Copying of any assignment, test, or quiz may result in zero points for ALL parties involved. It may also result in redoing an assignment or failure of the course.
5. Lab Safety: All students must abide by the rules and regulations of the Flinn Safety Contract. Failure to do this is cause for removal from class or other disciplinary actions.

<u>Grading Scale:</u>	50% labs/assignments	A	93-100
	50% quizzes/tests	B	85-92
		C	77-84
		D	69-76
		F	below 69



UNIT 1: THE NATURE OF SCIENCE AND PHYSICAL SCIENCE BASICS

Outcome: Students will demonstrate an understanding of God's plan for science in our lives by differentiating between relative science truths and God's absolute truth. Students will incorporate accepted scientific-mathematical procedures, evaluate and justify relationships within science processes.

Enabling Outcomes: the student will...

- use select portions of the Bible to locate truths revealed about God.
- explain the difference between God's Word and relative scientific truth.
- differentiate between pure science and technology.
- integrate the scientific method to solve real life problems.
- apply safety rules in lab and in class.
- demonstrate critical thinking by completing challenging exercises.
- use the scientific method to solve a variety of problems, mathematical, real life, and more.
- master the SI units and the corresponding prefixes and correctly do problems associated with them (i.e. conversions, density, and the like)
- be able to successfully complete a practical lab exam which incorporates the meter stick, balance, beaker, graduated cylinder, and thermometer.
- use procedure to make computerized graphs and tables and then interpret the data.
- apply basic library and computer skills to science class via a scavenger hunt.

textbook: pages 2-35 (Ch. 1)

Range of days: 12-17

Science Outcomes: Graduates of the WLHS Science Department will be:

1. God-Centered thinkers who

- 1.1 Utilize Scripture as a means of scientific discoveries and technology
- 1.2 Apply God's Word as it relates to science issues

2. Effective communicators who

- 2.1 Express an understanding of the major concepts and principles of science and related technology
- 2.2 Analyze opinions and statements set forth by others

3. Innovative problem solvers who

- 3.1 Use the scientific method to investigate relationships in order to draw conclusions and make and defend predictions and recommendations
- 3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed opinions

4. Self-directed learners who

- 4.1 Research, evaluate, and use scientific information from a variety of sources
- 4.2 Contribute both independently and cooperatively with their peers
- 4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society

School Outcomes: 1,2,3,4,5,6

UNIT 2: MATTER

Outcomes and Assessment: Students will recognize properties of matter in order to classify it; then distinguish between chemical and physical changes in matter and predict and evaluate why these changes occurred.

Enabling Outcomes: the student will...

- Explain the relationship between matter, atoms, and elements
- distinguish between elements and compounds
- interpret and write some common chemical formulas
- identify properties of matter in order to classify it in a variety of ways.

- perform calculations involving density
- explain how materials are suited for different uses based on their physical and chemical properties, and give examples
- compare and contrast physical and chemical changes
- state the laws of conservation of mass and conservation of energy, and explain how they apply to changes of state
- apply the Kinetic Theory of Matter to explain such changes
- research biblical stories that incorporate changes in state
- Define, describe and apply Archimedes' principle, Pascal's principle, Bernoulli's principle in dealing with fluids
- Explain and apply Boyle's law and Charles's law in dealing with gases

textbook: pages 36-99 (Ch. 2,3)

Range of days: 20-25

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- 1.2 Apply God's Word as it relates to science issues

2. Effective communicators who

- 2.1 Express an understanding of the major concepts and principles of science and related technology
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School Outcomes: 1,2,4,6

UNIT 3: ATOMS AND THE PERIODIC TABLE

Outcome: Students will trace the development of the model of the atom and relate that knowledge to explain the arrangement of the Periodic Table and extract information from the table.

Assessment: Students will research, present, and explain information on an assigned element to the class via a model and presentation. The model will include, but not be limited to, the name of the element, its chemical symbol, atomic structure, properties and uses.

Enabling Outcomes: the student will...

- utilize the scientific method and explain the development of modern atomic theory.
- identify subatomic particles and diagram they're corresponding location in select atoms.
- graphically determine the pattern of the Periodic Table and explain its arrangement
- understand God's intricate design of the elements and the periodic table
- identify trends of the Periodic Table by comparing groups and periods.
- explain why some atoms gain or lose electrons to form ions
- determine how many protons, neutrons, and electrons an atom has, given its symbol, atomic number, and mass number
- describe how the abundance of isotopes affects an element's average atomic mass
- solve problems converting the amount of an element in moles to its mass in grams, and vice versa

textbook: pages 100-179 (Ch. 4-5)

Range of days: 20-29

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3. Innovative problem solvers who

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School Outcomes: 1,2,3,4,5,6

UNIT 4: CHEMICAL REACTIONS

Outcomes: Students will explain why and how atoms combine. Students will classify types of chemical reactions and identify factors, which will affect their reaction rate in solution.

Enabling Outcomes: the student will...

- recognize some signs that a chemical reaction may be taking place
- use oxidation numbers to predict products of chemical reactions and write proper chemical formulas.
- compare and contrast ionic and covalent bonds.
- balance equations according to the Law of Conservation of Matter.
- identify types of chemical reactions (i.e. endothermic, exothermic, combustion, decomposition, single and double displacement, neutralization, synthesis, etc.)

textbook: pages 182-220 (Ch. 6)

Range of days: 12-17

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2. Effective communicators who

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3. Innovative problem solvers who

3.2 Use scientific knowledge to investigate the natural world, to solve problems, and to make informed opinions

4 Self-directed learners who

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4.3 Make decisions using scientific knowledge to assess the effect of scientific discoveries on themselves and society

School Outcomes: 2,3,5

UNIT 5: SOLUTIONS: ACIDS, BASES and SALTS

Outcome: Students will further explore the classification of matter and discover that pure substances are used frequently in our every day lives. Students will be able to differentiate and describe many common acids, bases and salts and will predict products when these solutions react with one another.

Assessment: Students will work in groups to perform titrations and neutralization labs. Students will research acid rain and the problems that occur when pollution is emitted into the earth's atmosphere.

Enabling Outcomes: the student will...

- list factors, which speed up or slow down the rate of practical, everyday reactions
- distinguish between heterogeneous and homogeneous mixtures
- give examples of solutions that contain solids or gases
- compare the properties of suspensions, colloids, and solutions
- explain why the polarity of water enables it to dissolve many different substances
- research and react to banning DMHO due to extensive damage it can cause
- compare and contrast polar and nonpolar solutions
- distinguish between ionization and dissociation of strong and weak acids and bases

-relate pH to the concentration of hydronium and hydroxide ions in a solution

textbook: pages 222-281 (Ch. 7-8)

Range of days: 14-22

Science Outcomes: Graduates of the WLHS Science Department will be:

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2. Effective communicators who

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3. Innovative problem solvers who

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School Outcomes: 1,2,3,4,5,6