2016-2017
PHYSICAL SCIENCE HONORS

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TEXT: Glencoe Science McGraw Hill – *Physical Science* 2008 ($67.50 replacement cost)
ISBN – 978-0-07-878533-7 (www.glencoe.com)

COURSE DESCRIPTION: This introductory level science course is designed to develop scientific literacy, problem solving skills, and an understanding of the interrelationships of matter and energy. The goal of this course is to help students better understand their immediate surroundings and, in turn, the world.

REQUIRED DAILY SUPPLIES: one inch binder, 10 tabs, composition notebook, textbook, paper, #2 pencils, black ink pens, expo marker, basic calculator, note cards 3x5, colored pencils, ruler, and protractor.

SYLLABUS UNIT OBJECTIVES:

Unit of	Topics	Chapter	Time Line
Unit 0	Science Process Skills,	**1**	**3 weeks**
	Phases of Matter, Density	**16**	
Unit 1	Classification of Matter	**15**	**4 weeks**
	Atomic Structure	**17**	
	Periodic Trends	**19**	
Unit 2	Nuclear Changes	**18**	**2 weeks**
Unit 3	Bonding	**20**	**5 weeks**
	Chemical Reactions and Equations	**21**	
Unit 4	Solutions	**22**	**3 weeks**
	Acids and Bases	**23**	
Unit 5	Motion	**2**	**3 weeks**
	Forces	**3**	
Unit 6	Work and Machines	**5**	**2 weeks**
Unit 7	Energy	**4**	**2 weeks**
	Thermal Energy	**6**	
Unit 8	Waves	**10**	**2 weeks**
	Sound	**11**	
Unit 9	Electromagnetic Waves	**12**	**3 weeks**
	Light	**13**	
	Mirrors and Lenses	**14**	
Unit 10	Electricity	**7**	**2 weeks**
	Magnetism	**8**	
EOCT	Review for EOCT (April 29th – May 3rd)	**1-23**	**2 weeks**
CULMINATING ACTIVITIES			**10-12 DAYS**

GA PERFORMANCE STANDARDS: The specific content objectives covered for this part of the course are as follows: This year the state of Georgia has begun to implement new standards called Common Core standards. These include literacy (reading and writing) standards for the sciences. This will mean an intentional effort to improve both your reading and writing skills particularly in science and scientific thinking. This link will take you to them:
https://www.georgiastandards.org/Common-Core/Documents/CCGPS_9-10_SS-Science-Tech-Literacy_Standards.pdf
https://www.georgiastandards.org/Common-Core/Documents/CCGPS_11-12_SS-Science-Tech-Literacy_Standards.pdf

SPS1. *Students will investigate our current understanding of the atom*.

a. Examine the structure of the atom in terms of
   - Explain the relationship of the proton number to the element's identity
   - Proton, electron, and neutron locations
   - Atomic mass and atomic number
   - Atoms with different number of neutrons (isotopes)
   - Atoms with different numbers of protons

b. Compare and contrast ionic and covalent bonds in terms of electron position.

SPS2. *Students will explore the nature of matter, its classifications, and the system for naming types of matter.*

a. Calculate density when given a means to determine a substance's mass and volume.
b. Predict formulas for stable binary ionic compounds based on balance of charges.
c. Use IUPAC nomenclature for transition between chemical names and chemical formulas of
   - binary ionic compounds (containing representative elements)
   - binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride)

d. Demonstrate the Law of Conservation of Matter in a chemical reaction.
e. Apply the Law of Conservation of Matter by balancing the following types of chemical equations:
   - Synthesis, Decomposition, Single Replacement, Double Replacement

SPS3. *Students will distinguish the characteristics and components of radioactivity.*

a. Differentiate among alpha and beta particles and gamma radiation.
b. Differentiate between fission and fusion.
c. Explain the process half-life as related to radioactive decay.
d. Describe nuclear energy, its practical application as an alternative energy source, and its potential problems.

SPS4. *Students will investigate the arrangement of the Periodic Table*.

a. Determine the trends of the following:
   - Number of valence electrons
   - Types of ions formed by representative elements
   - Location of metals, nonmetals, and metalloids
   - Phases at room temperature

b. Use the Periodic Table to predict the above properties for representative elements.

SPS5. *Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.*

a. Compare and contrast the atomic/molecular motion of solids, liquids, gases, and plasmas.
b. Relate temperature, pressure, and volume of gases to the behavior of gases.

SPS6. *Students will investigate the properties of solutions.*

a. Describe solutions in terms of
   Solute/solvent Conductivity Concentration
b. Observe factors affecting the rate a solute dissolves in a specific solvent.
c. Demonstrate that solubility is related to temperature by constructing a solubility curve.
d. Compare and contrast the components and properties of acids and bases.
e. Determine whether common household substances are acidic, basic, or neutral.

SPS7. *Students will relate transformations and flow of energy within a system.*

a. Identify energy transformations within a system (e.g. lighting a match).
b. Investigate molecular motion as it relates to thermal energy changes in terms of conduction, convection, and radiation.
c. Determine the heat capacity of a substance using mass, specific heat, and temperature.
d. Explain the flow of energy in phase changes through the use of a phase diagram.

SPS8. *Students will determine relationships among force, mass, and motion.*

a. Calculate velocity and acceleration.
b. Apply Newton's three laws to everyday situations by explaining the following:
   - Inertia
   - Relationship between force, mass, and acceleration
   - Equal and opposite forces
c. Relate falling objects to gravitational force.
d. Explain the difference in mass and weight.
e. Calculate the amounts of work and mechanical advantage using simple machines.

SPS9*. Students will investigate the properties of waves.*

a. Recognize that all waves transfer energy.
b. Relate frequency and wavelength to the energy of different types of electromagnetic waves and mechanical waves.
c. Compare and contrast the characteristics of electromagnetic and mechanical (sound) waves.
d. Investigate the phenomena of reflection, refraction, interference, and diffraction.
e. Relate the speed of sound to different mediums.
f. Explain the Doppler Effect in terms of everyday interactions.

SPS10*. Students will investigate the properties of electricity and magnetism.*

a. Investigate static electricity in terms of:
   - Friction Induction Conduction
b. Explain the flow of electrons in terms of:
   - Alternating and direct current
   - The relationship among voltage, resistance, and current
   - Simple series and parallel circuits
c. Investigate applications of magnetism and/or its relationship to the movement of electrical charge as it relates to:
   - Electromagnets Simple motors Permanent magnets

CLASSROOM RULES

1. Be polite and respectful
2. Be prompt and prepared
3. Be productive
4. **Food and canned/bottled drinks are not to be consumed in the classroom without permission.**
5. Obey all school rules.

CLASSROOM PROCEDURES

Tardy Students: Students must be in their seats and ready to work when the bell rings.

1st Tardy: Warning
2nd Tardy: one day private detention with teacher
3rd Tardy: referral to administrator and two days public detention

4th Tardy: referral to administrator and one day Saturday Opportunity School

Grading Procedure: There will be periodic grade checks and reports sent home.
Tests/Projects: **40%** Quizzes: **30%** Final Exam: **15%**
Assignments (Classwork/Homework/Lab): **15%**

Grading Scale: **A:** 90-100 **B:** 80-89 **C:** 70-79 **F:** 0-69

Leaving the Room: Students must utilize time given between classes to go to their lockers and the restroom. Absolutely no one is allowed to leave the room during the first and last 10 minutes of class nor while I am teaching.

Student Participation: Students are expected to pay attention and contribute to class activities. This includes taking notes; you learn more when you are an active learner. Student comments and questions are welcomed. Good participation can be very effective in learning new material; it is also helpful if you have a borderline grade. It will allow me to give you an "extra boost" if you need it.

Late Work: All work is due at the beginning of class on the date it is due. Students will not be allowed to go to their lockers to get work that is not in their possession at the beginning of class. Homework will accepted one day late for 50% credit only. However you may turn in projects or major assignments late for 20% of the earned grade deducted for each day. Excused absences will be allowed to turn in work as per school policy.

Help Sessions: Help sessions are available before and after school. Please set a confirmed appointment time and I will be there for you.

Make-up Work Policy or Absence: Make up work is your duty and responsibility to collect.
On your first day back to class, you must provide proof of excused absence. Unexcused absences receive no credit. Check the make up binder on the counter for any important material that you have missed.

Student Responsibility: Be respectful to the teacher, fellow classmates, and the things and equipment of others. If you act like mature adults, you will be treated as such. Correction of student misconduct within a given class period will follow the following procedure:

1st Occurrence	Verbal Warning
2nd Occurrence	Private Detention &/or Parent/Guardian Contact
3rd Occurrence	Administrative Referral &/or Parent/Guardian Contact

Conference Information: Parents/guardians may correspond with me via email to schedule an appointment to discuss any concerns they may have.

Home Access Center (HAC) : Parents have access to their child's grades through HAC.

Fulton County Policy – Provision for Improving Grades
Opportunities designed to allow students to recover from a low or failing cumulative grade will be allowed when all work required to date has been completed and the student has demonstrated a legitimate effort to meet all course requirements including attendance. Students should contact the teacher concerning recovery opportunities. Teachers are expected to establish a reasonable time period for recovery work to be completed during the semester. All recovery work must be directly related to course objectives and must be completed ten school days prior to the end of the semester. Teachers will determine when and how students with extenuating circumstances may improve their grades. See student handbook for further information.