Contact Information: Parents may contact me by phone, email or visiting the school.
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CHS Vision Statement: Our vision is to be a caring learning center respected for its comprehensive excellence.

CHS Mission Statement: Our mission is to prepare our students to serve their communities and to commit to life-long learning.

Course Description and Prerequisite(s) from Course Handbook:
Physical Science - 305 (1 semester)
State Course # 132220, Level I
Prerequisite: None
Required Option Grade: 9
Graded Conventionally Credit: 1

Physical science introduces students to key concepts and theories that provide a foundation for further study in other sciences and advanced science disciplines. Physical science comprises the systematic study of the physical world as it relates to fundamental concepts about matter, energy and motion. A unified understanding of phenomena in physical systems is the culmination of all previously learned concepts related to chemistry, physics, and space science, along with historical perspective and mathematical reasoning. There is a $15 lab fee.

Big Ideas/Purpose per Unit and Essential Questions/Concepts per Unit: Defined below for clarity are the Unit Titles, Big Ideas of every Unit taught during this course, and the Essential Questions to be answered to better understand the Big Ideas. A student’s ability to grasp and answer the Essential Questions will define whether or not he or she adequately learns and can apply the skills found in Big Ideas. This will ultimately define whether or not a student scores well on assessments given for this course. The Common Core Standards can be found at http://www.corestandards.org/the-standards. (Teacher Note: The Ainsworth Model suggests 1-3 Big Ideas for each Unit and 1-3 Essential Questions per Big Idea. Each Unit will vary.)

- 1st or 3rd 9 Weeks
  - Unit I Title: The Process of Science and Matter
    - Big Idea #1: Science is a process of inquiry, observation, experimentation, and analysis.
- **Essential Question #1**: How do I make observations and calculate data involving metric units?
- **Essential Question #2**: How do I design a controlled experiment to appropriately test a hypothesis?
- **Essential Question #3**: How do I recognize patterns and trends to draw conclusions using the scientific method?

**Big Idea #2**: All matter can be organized into groups based on properties and composition.
- **Essential Question #1**: How do I use physical and chemical properties to identify/describe an unknown substance?
- **Essential Question #2**: How do I classify matter based on its composition?
- **Essential Question #3**: How do I calculate density of various objects?

**Big Idea #3**: Energy changes the states and interactions of matter.
- **Essential Question #1**: How do I use the kinetic molecular theory to describe matter’s behavior in each state?
- **Essential Question #2**: How do I describe endothermic and exothermic changes in matter?

- **Unit II Title: Atoms & The Periodic Table**
  - **Big Idea #1**: Atoms are the building blocks of matter.
    - **Essential Question #1**: How do I interpret data for each element on the periodic table?
    - **Essential Question #2**: How do I identify and describe the nature of subatomic particles?
    - **Essential Question #3**: How do I trace the atomic model through history?
    - **Essential Question #4**: How do I place subatomic particles in appropriate places in an atom?
  - **Big Idea #2**: The periodic table shows trends in properties of elements.
    - **Essential Question #1**: How do I identify properties and position of metals and nonmetals on the periodic table?
    - **Essential Question #2**: How do I distinguish between a group or family and a period on the periodic table?
    - **Essential Question #3**: How do I explain the similarities of elements in the same group or family?

- **Unit III Title: Chemical & Nuclear Reactions**
  - **Big Idea #1**: Atoms combine to form compounds.
    - **Essential Question #1**: How do I compare and contrast ionic and covalent bonding?
    - **Essential Question #2**: How do I write chemical formulas and name compounds?
  - **Big Idea #2**: Elements in compounds are rearranged in chemical reactions to form new substances.
• Essential Question #1: How do I balance chemical equations to show conservation of matter?
• Essential Question #2: How do I explain how heat energy affects the rate and products of chemical reactions?

□ Big Idea #3: Nuclear reactions break down atoms creating new elements, releasing energy in the process.
  • Essential Question #1: How do I describe the opposing forces in an atomic nucleus?
  • Essential Question #2: How do I calculate and graph the radioactive decay of a substance using its half-life?
  • Essential Question #3: How do I compare and apply fission and fusion reactions?

• 2nd or 4th 9 Weeks
  ○ Unit IV Title: The Universe
    □ Big Idea #1: The history of the universe involves evolution of galaxies and stars.
      • Essential Question #1: How do I use supporting evidence to explain the big bang theory?
      • Essential Question #2: How do I explain the relative motion of universal objects in terms of red and blue shifts?
      • Essential Question #3: How do I trace the lives of stars based on their classification?
  ○ Unit V Title: Newtonian Physics
    □ Big Idea #1: The motion of an object can be measured by its direction and magnitude.
      • Essential Question #1: How do I calculate speed and find direction of a moving object?
      • Essential Question #2: How do I calculate acceleration of a moving object?
      • Essential Question #3: How do I construct and interpret velocity and acceleration graphs?
    □ Big Idea #2: Forces act on objects, causing them to change their motion.
      • Essential Question #1: How do I draw force diagrams and determine net force?
      • Essential Question #2: How do I explain how friction and gravity affect an object’s motion?
      • Essential Question #3: How do I apply Newton’s Three Laws of Motion in appropriate situations?
    □ Big Idea #3: Energy is required to do work.
      • Essential Question #1: How do I explain the Law of Conservation of Energy?
      • Essential Question #2: How do I explain methods of energy transfer?
• Essential Question #3: How do I calculate kinetic and potential energy?

o Unit VI Title: Electricity/Waves
  ▪ Big Idea #1: Electricity is the flow of electrons that can generate power.
    • Essential Question #1: How do I explain the relationships among ‘current’, ‘resistance’, and ‘voltage’?
    • Essential Question #2: How do I distinguish volts, resistance, and current in series and parallel circuits?
  ▪ Big Idea #2: Many types of energy can be transmitted through wave interactions.
    • Essential Question #1: How do I describe the results of various wave interactions?
    • Essential Question #2: How do I discuss the properties of sound waves?
  ▪ Big Idea #3: The electromagnetic spectrum is divided into bands that have different applications.
    • Essential Question #1: How do I classify the divisions of the electromagnetic spectrum?
    • Essential Question #2: How do I analyze applications of the electromagnetic spectrum?
    • Essential Question #3: How do I contrast different sources of light?

• END OF COURSE EXAM


Course Expectations
Welcome to the exploration of our physical world through scientific inquiry (question asking and answering). Our study of physical science will revolve around hands-on learning experiences that will put you in the role of discovering truths about the world in which we live. Such activities require an open and focused mind. Your performance in this class will be measured by how well you can solve problems and demonstrate your understanding of concepts, not by how well you can memorize facts. For this reason, your active participation and productivity in class are the most significant commitments you can make to yourself and me during this course. I look forward to our joint exploration of the physical world around us!

Course Material
• textbook classroom set with online access at my.hrw.com
• notebook
• calculator (scientific preferred)
• writing utensils
Grading
Unit Exams 50%
Assessments (Including: Quizzes, Essays, Labs, and Projects) 30%
Homework 10%
Class work 10%
  • End of Course Exam is 20% of a student’s final grade.

Grading Scale
The grading scale for Chillicothe High School can be found in the student handbook.

Late Work: Late work will be subject to the board adopted policy on assignments that are turned in late (to be reviewed in class).

CHS TENTATIVE Course Schedule
This is an overview of what will be covered in this course at CHS for this school year. Although, I would like to follow this plan verbatim this year’s tentative schedule is subject to change (at the teacher’s discretion).

1st or 3rd 9 Weeks
Week 1: Beginning of the Year Pre-Assessment Exam
Unit I Title: Process of Science and Matter
Week 1: Scientific Method (‘Design Your Own Experiment’ project)
  • Formative Assessment
Week 2: Matter Properties and Composition
  • Formative Assessment
Week 3: Interactions of Matter and Energy Changes
  • Unit I Summative Assessment
Unit II Title: Atoms and the Periodic Table
Week 3: Periodic Table (Periodic Table Wall project)
  • Formative Assessment
Week 4: Atomic Structure
  • Formative Assessment
Weeks 5-6: History of the Atomic Model
  • Unit II Summative Assessment
Unit III Title: Chemical and Nuclear Reactions
Week 7: Formation of Compounds
  • Formative Assessment
Weeks 7-8: Chemical Reactions/Nuclear Reactions
  • Formative Assessment
Weeks 8-9: Nuclear Reactions (Half-Life activity)
  • Unit III Summative Assessment

2nd or 4th 9 Weeks
Unit IV Title: The Universe
Week 1: The Big Bang Theory
Week 1-2: Doppler Effect
  • Formative Assessment
Week 2-3: Star Life Cycle and Classification (Star Life Cycle)
• Formative Assessment
• Unit IV Summative Assessment
Unit V Title: Newtonian Physics
Week 4: Velocity and Acceleration
  • Formative Assessment
Week 5: Newton’s Laws (Galileo Ball Drop experiment)
  • Formative Assessment
Week 6: Energy Transfer
  • Unit V Summative Assessment
Unit VI Title: Electricity and Waves
Week 7: Circuits and Flow of Electrons (Building Circuits)
  • Formative Assessment
Week 8: Wave Interactions
  • Formative Assessment
Week 9: Electromagnetic Spectrum
  • Unit VI Summative Assessment
END OF COURSE EXAM

Performance Based Section: Writing
Assignments/Exams/Presentations/Technology
One or more of the End of Unit Exams may be Performance Based. According to the Ohio Department of Education, “Performance Based Assessments (PBA) provides authentic ways for students to demonstrate and apply their understanding of the content and skills within the standards. The performance based assessments will provide formative and summative information to inform instructional decision-making and help students move forward on their trajectory of learning.” Some examples of Performance Based Assessments include but are not limited to portfolios, experiments, group projects, demonstrations, essays, and presentations.
CHS Physical Science Course Syllabus

After you have reviewed the preceding packet of information with your parent(s) or guardian(s), please sign this sheet and return it to me so that I can verify you understand what I expect out of each and every one of my students.

Student Name (please print): __________________________________________________

Student Signature: _______________________________________________________

Parent/Guardian Name (please print): _______________________________________

Parent/Guardian Signature: _____________________________________________

Date: ____________________________________________________________________