

School: Crook County High School

Course Title: Physical Science A

Semester: 1

Course Description: Physical Science A is designed to instruct students on the basics of science as a discipline and to introduce the student to various aspects of physical science. The course will cover the following topics: Metric measurement, Scientific Method, Forces & Motion, Work, Power & Simple Machines, and Energy.

Learning Standards (Critical Content Power Standards)

At the end of the course, the student will be able to understand:

- How to convert using the metric system
- That energy cannot be created nor destroyed
- That matter cannot be created nor destroyed
- That a wave is a disturbance that transmits energy.
- That the atom is the basic unit of matter
- The purpose and the process of the scientific method
- That “Newton’s Laws of Motion” and “The Universal Law of Gravity” apply to all matter

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter

- The structure and interactions of matter at the bulk scale are determined by electrical forces within and between atoms. (secondary to HS-PS2-6)

PS2.A: Forces and Motion

- Newton’s second law accurately predicts changes in the motion of macroscopic objects. (HS-PS2-1)
- Momentum is defined for a particular frame of reference; it is the mass times the velocity of the object. (HS-PS2-2)
- If a system interacts with objects outside itself, the total momentum of the system can change; however, any such change is balanced by changes in the momentum of objects outside the system. (HS-PS2-2),(HS-PS2-3)

PS2.B: Types of Interactions

- Newton’s law of universal gravitation and Coulomb’s law provide the mathematical models to describe and predict the effects of gravitational and electrostatic forces between distant objects. (HS-PS2-4)
- Forces at a distance are explained by fields (gravitational, electric, and magnetic) permeating space that can transfer energy through space. Magnets or electric currents cause magnetic fields; electric charges or changing magnetic fields cause electric fields. (HS-PS2-4),(HS-PS2-5)

- Attraction and repulsion between electric charges at the atomic scale explain the structure, properties, and transformations of matter, as well as the contact forces between material objects. (HS-PS2-6),(secondary to HS-PS1-1),(secondary to HS-PS1-3)

PS3.A: Definitions of Energy

- “Electrical energy” may mean energy stored in a battery or energy transmitted by electric currents. (secondary to HS-PS2-5)

ETS1.A: Defining and Delimiting an Engineering Problem

- Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (secondary to HS-PS2-3)

ETS1.C: Optimizing the Design Solution

- Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. (secondary to HS-PS2-3)

PS4.A: Wave Properties

- The wavelength and frequency of a wave are related to one another by the speed of travel of the wave, which depends on the type of wave and the medium through which it is passing. (HS-PS4-1)
- Information can be digitized (e.g., a picture stored as the values of an array of pixels); in this form, it can be stored reliably in computer memory and sent over long distances as a series of wave pulses. (HS-PS4-2),(HS-PS4-5)
- [From the 3–5 grade band endpoints] Waves can add or cancel one another as they cross, depending on their relative phase (i.e., relative position of peaks and troughs of the waves), but they emerge unaffected by each other. (Boundary: The discussion at this grade level is qualitative only; it can be based on the fact that two different sounds can pass a location in different directions without getting mixed up.) (HS-PS4-3)

PS4.B: Electromagnetic Radiation

- Electromagnetic radiation (e.g., radio, microwaves, light) can be modeled as a wave of changing electric and magnetic fields or as particles called photons. The wave model is useful for explaining many features of electromagnetic radiation, and the particle model explains other features. (HS-PS4-3)
- When light or longer wavelength electromagnetic radiation is absorbed in matter, it is generally converted into thermal energy (heat). Shorter wavelength electromagnetic radiation (ultraviolet, X-rays, gamma rays) can ionize atoms and cause damage to living cells. (HS-PS4-4)
- Photoelectric materials emit electrons when they absorb light of a high-enough frequency. (HS-PS4-5)

Materials:

Texts: Online Text book: StemScopes. Will be available on the Google Chromes

Film, Videos/ Other Electronic Media: Periodic educational films will be shown along with PowerPoint Presentations and video feeds from the internet.

Student Notebook - Since taking notes is a required part of this class, all students are

required to have a student notebook. And will be using AVID Binders or Interactive Notebooks depending on which teacher you have.

Notification of the Right to Object to the Use of Materials

Any resident of the district may raise objection to instructional materials used in the district's educational program despite the fact that the individuals selecting such materials were duly qualified to make the selection and followed the proper procedure and observed the criteria for selecting such material.

The first step in expressing objection is consultation with the classroom teacher or library staff and providing a brief written complaint. The staff member receiving a complaint regarding instructional materials shall try to resolve the issue informally through the discussion of the original assignment or the opportunity for an alternative assignment.

If not satisfied with the initial explanation or an alternative assignment, the person raising the questions will meet with a building administrator who, if unable to resolve the complaint, will provide a Request for Reconsideration form which will be given to the superintendent for action.

Goals:

By the end of the semester 100% of students will meet or exceed subject level learning standards in science as measured by a score of 70% or better on the final exam.

Citizenship (Behavior Expectations)

Attendance - Attendance is crucial to the understanding of the critical content. Those students who do not regularly attend usually struggle with the class content. If absences are unavoidable, please contact the teacher to arrange alternate assignments and learning opportunities.

Participation

- take part in classroom discussion
- complete all assignments, projects, presentations
- take notes when given
- participate in all openers

Behavior

- Follow all rules and procedures
- Be in your seat when the bell rings
- Do not interfere with the education of others
- Do not line up at the door before the bell rings
- Do not leave the classroom without a pass
- Do not use a cell phone or similar device in classroom during classroom time.
- Do not disrupt the physical environment of the classroom i.e. throwing objects, writing on furniture, damaging items in the classroom, inappropriate use of the physical environment.
- Be reasonable, respectful and responsible

Evaluation (grading)

Grades may be comprised from scores in any of the following:

- Daily Quizzes
- Daily Assignment/Homework
- Lab Work
- Projects
- Presentations
- Quizzes
- Exams

Grading Scale

The grading scale is weighted with a computer program. Not all grades are weighted the same. **90%** of the grade is assessed from assessments. **10%** of the grade comes from the other methods mentioned above. Retakes will be offered for each assessment taken, giving students the chance to show proficiency or mastery of material covered. Students will need to complete an **Assessment Retake Form** PRIOR to retaking any assessments. If the retake form is not turned in student will NOT be allowed to retake the assessment, until the form is received.

A = 90%-100%

B = 80%-89%

C = 70%-79%

D = 60%-69%

F = Below 60%

Makeup Policy - Assignments are due, at the beginning of class, on the date for which they were assigned. Assignments turned in after the due dates are docked 10% per day they are late. **NO ASSIGNMENTS WILL BE ACCEPTED AFTER THE UNIT EXAM PERTAINING TO THAT MATERIAL.**

Extra Credit Policy - Extra credit is generally discouraged but exceptions can be made if there are extenuating circumstances. See the teacher individually.