Wilby High School

Principal
Michele Buerkle

Assistant Principals
Elizabeth Henson
Paul Drewry
Dawn Kalach

PHYSICAL SCIENCE SYLLABUS 2016 - 2017
Instructor: Dr. Joseph Pacheco, Room 224

Course Description: Physical Science is a basic course that provides a broad overview of earth science, chemistry, and physics. Analytical skills including the scientific method, measurement, and data analysis are developed. Students who complete this course will develop an understanding of interconnections among the sciences, technology, and the environment. Students who are successful in Physical Science have a willingness to complete nightly assignments with comprehension, have good attendance, and actively participate in classroom activities. A typical week includes a combination of inquiry, lecture, group work, and problem-solving. On average, students will work on homework 15-30 minutes per night or approximately 2-3 hours per week.

Textbook: *PHYSICAL SCIENCE: Concepts in Action* PEARSON (2011)

Instructional Method: This course will be taught through a series of lectures, discussions, assignments, homework, class participation, practical demonstration as well as examinations.

1st Quarter Syllabus:

- SCIENTIFIC METHOD: Steps, Observation (Qualitative/Quantitative) vs inferences, Variables - independent/dependent/control.
- METRIC MEASUREMENT: Metric System Review, Conversions, Length, perimeter, area, Volume, liquid & solid, Density, Temperature - scales (Celsius, Kelvin) & Metric Conversions
- GRAPHING: Data tables, Graph Types, Graphing experimental data (single & multiple lines), Relationships (direct/positive & indirect/negative), Analyzing Graphs
- MATTER: States of matter, Phase changes – (inc. melting & boiling point), Physical/chemical properties, Physical/chemical changes, Heterogeneous vs homogeneous mixtures, Water cycle – Law of conservation of matter

2nd Quarter Syllabus:

- ATOMS: Protons, electrons, neutrons (P,E,N), Atomic number & mass, Bohr model, History of the Atomic Model.
- PERIODIC TABLE: Energy levels/valence electrons/Lewis dot diagrams, Patterns in the periodic table, Metals/nonmetals/metalloids, Properties of families, alkali metals, alkaline earth metals, halogens, noble gases.
- BONDING: Atoms/molecules/compounds, Ionic/covalent/metallic bonds
- CHEMICAL EQUATIONS: Reactants vs products, Law of conservation of mass – simple balancing equations (no polyatomics),
- ORGANIC CHEMISTRY: Chemical structure and properties of carbon, Monomers vs polymers
- ACIDS AND BASES: Solutions, solvents, and solubility, Characteristics of acids and bases, pH scale

The mission of Wilby High School is to involve school, home, and community resources to provide all students a safe environment where they have the opportunity to acquire the knowledge, skills, and experience needed to reach their full potential as responsible, contributing members of society.

460 Bucks Hill Road
Phone 203 574-8100 Waterbury, Connecticut 06704 *Fax* 203-574-6896

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3rd Quarter Syllabus:

- FORCES AND MOTION: Speed vs velocity vs acceleration, Gravity, Friction
- ENERGY: Types of energy – potential vs kinetic, Relationship b/t energy and mass (PE = mgh, KE = ½ mv^2), Energy transfers – solar, chemical, electrical, thermal, Law of conservation of energy
- HEAT AND LIGHT: Principles of light – refraction, reflection, absorption, Electromagnetic spectrum, Heat energy – convection, conduction, radiation
- ELECTRICITY: Static electricity & electric charges, Circuits – open/closed, series/parallel, circuit diagrams, Ohm's Law (I = V/R) – current, voltage, resistance, Electrical safety

4th Quarter Syllabus:

- MAGNETISM: Magnetic fields (like poles vs unlike poles)
- ELECTROMAGNETISM: Electromagnetic induction, Transformers – step up/step down
- GLOBAL IMPACT on the ENVIRONMENT: Fossil fuels – formation, nonrenewable, pollution issues, Pros/cons of using fossil fuels to generate electricity, Power grids & electricity pathways, Difference between greenhouse effect (solar budget with greenhouse gases), global warming, climate change
- PROS AND CONS OF ALTERNATIVE RESOURCES: Renewable vs nonrenewable sources, Availability, portability, efficiency, expense, & environmental impact for each resource, Comparison of Nuclear, Geothermal, Solar, Biomass, Wind, and Hydropower.
- BROWNFIELDS AND IMPACTED HABITATS: What are they, Point and nonpoint sources of pollution
- SUSTAINABILITY AND HUMAN PROBLEM SOLVING: Raw materials vs recycling, Waste disposal options and recycling codes, Waste reduction & conservation
- GREEN LIVING: Green chemistry & technology, Mass transportation, Appliance options

Grading Per Quarter:

25% Homework Assignments
25% Quizzes, Projects
40% Tests
5% Attendance
5% Participation
100% Course Grade

Grading Per Year:

75% Quarterly Grades
25% Mid Term & Final Exam
100% Course Grade

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