



LINCOLN-WOODSTOCK COOPERATIVE SCHOOL DISTRICT COURSE SYLLABUS

Course Name: Physical Science

Length: Full Year

Teacher: Katie Parent

Course Description: This physical science course is designed for students who want to better understand the sciences, who may not be planning to continue further education in them. There will be a wide variety of projects and experiments, which will investigate the world from a chemical perspective. The student will be exposed to several chemical applications as well as the science-technology relationship. Topics covered include research design, scientific measurement, atomic structure, chemical reactions, solutions, bonding, states of matter, light, gas laws, periodicity, objects in motion, forces, Newton's Laws, work, energy, waves, sound, light, electricity, and magnetism.

Competencies or Standards Assessed:

- HS-PS1-1: Valence Electrons and Properties of Elements
- HS-PS1-2: Simple Chemical Reactions
- HS-PS1-3: Electrical Forces and Bulk Scale Structure
- HS-PS1-4: Total Bond Energy Change in Chemical Reactions
- HS-PS1-5: Collision Theory and Rates of Reaction
- HS-PS1-6: Increased Product Design Solution
- HS-PS1-7: Conservation of Atoms in Chemical Reactions
- HS-PS1-8: Fission, Fusion, and Radioactive Decay
- HS-PS2-1: Newton's Second Law of Motion
- HS-PS2-2: Conservation of Momentum
- HS-PS2-3: Reducing Force in Collisions Device
- HS-PS2-4: Gravitational and Electrostatic Forces Between Objects
- HS-PS2-5: Electric Current and Magnetic Fields
- HS-PS2-6: Molecular-Level Structure of Designed Materials
- HS-PS3-1: Energy Change in Components of a System
- HS-PS3-2: Macroscopic Energy Due to Particle Position and Motion
- HS-PS3-3: Energy Conversion Device Design
- HS-PS3-4: The Second Law of Thermodynamics
- HS-PS3-5: Energy Change Due to Interacting Fields
- HS-PS4-1: Wave Properties in Various Media
- HS-PS4-2: Digital Transmission and Storage of Information
- HS-PS4-3: Wave-Particle Duality of Electromagnetic Radiation
- HS-PS4-4: Absorption of Electromagnetic Radiation

HS-PS4-5: Waves and Information Technology

Anchor Texts or Major Curriculum:
CK-12 [Physical Science](#)- Online FlexBook 2.0

Course Outline (major units of study):

Unit Title	Essential Question or Overarching Understanding
Unit 1 Introduction to Physical Science	How do scientific inquiry and precise measurement help us understand the physical world?
Unit 2 Matter and Change	How can we use physical and chemical properties to classify the diverse forms of matter?
Unit 3 Atomic Structure	How does the arrangement of subatomic particles determine an atom's identity and behavior?
Unit 4 The Periodic Table	How does the organization of the periodic table predict the reactivity and properties of elements?
Unit 5 Chemical Interaction	Why do atoms bond, and how do these interactions result in new substances with unique properties?
Unit 6 Carbon Chemistry	Why is carbon the fundamental building block for the complex molecules found in living things?
Unit 7 Solutions, Acids, and Bases	How do substances interact in mixtures, and how do we measure the strength of acids and bases?
Unit 8 Nuclear Chemistry	How do changes in an atom's nucleus release energy, and what are the risks and benefits of radiation?
Unit 9 Objects in Motion	How can we mathematically describe and predict the motion of an object over time?
Unit 10 Forces	How do various forces, like gravity and friction, influence the state of motion of an object?



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Motion	Unit 11 Newton's Laws of	How do Newton's three laws explain the relationship between force, mass, and acceleration?
Unit 12 Fluid Forces		How do pressure and buoyancy affect the behavior of objects submerged in liquids and gases?
Unit 13 Work and Machines		How do simple machines leverage work and power to make tasks easier for humans?
Unit 14 Introduction to Energy		In what ways is energy conserved or transformed as it moves through different systems?
Unit 15 Thermal Energy and Heat		How is thermal energy transferred between objects, and how does it affect the states of matter?
Unit 16 Waves		How do mechanical and electromagnetic waves transport energy without transporting matter?
Unit 17 Sound		How does the medium of a sound wave affect its pitch, volume, and speed?
Unit 18 Electromagnetic Radiation		How does the electromagnetic spectrum impact modern technology and human health?
Unit 19 Visible Light		How do reflection and refraction allow us to manipulate light to see the world around us?
Unit 20 Electricity		How does the flow of electrons through circuits power our daily lives?
Unit 21 Magnetism		How do magnetic fields originate, and how do they interact with other magnetic materials?
Unit 22 Electromagnetism		How can electricity be used to create magnetism, and how does magnetism generate electricity?

Portrait of a Learner

Independent Learner

I make thoughtful plans and do my best to reach personal goals using feedback to work

through challenges.

Responsible Collaborator

I work with others to achieve shared goals by listening actively, contributing ideas, and managing conflict.

Critical Thinker

I analyze information, ask thoughtful questions, and apply reasoning skills to solve problems and make decisions.

Effective Communicator

I express ideas clearly, adapting strategies based on the audience, setting, and/or purpose.

Global Citizen

I show that I care and take responsibility by helping in my community and the world around me.

Additional Classroom Expectations:

I consider all my students to be responsible people. I expect every student to be present for class and come prepared for classes. I anticipate professional conduct and active class participation from my students. Class will begin promptly after the bell rings, and I expect everyone to come directly to class to avoid distractions. It is your responsibility to come and talk to me about missed classes. Please do not fall behind- playing catch-up is never fun. If you know you're going to be absent, collect your work ahead of time. Bring all your problems to me, and I will make sure you are on track all the time. Please refer to and comply with the high school student handbook. All the work submitted for grading should be the student's original work with proper citations on labs. Students may not work together on lab reports. When working in groups, submitted work should NOT be copied from each other.

Course Assessment: Course assessment will be based on weekly quizzes, homework, labs, exams, and participation.

Formative Assessments: 20%

Summative Assessments: 80%

Exams: You may not use any electronic devices, cell phones, cameras, mp3 players, laptops, or programmable calculators without prior permission from the instructor. Any student found using these devices would be considered to have cheated and reported for further action.

Quizzes: There are Friday quizzes based on the material covered during that week. It will have 3-15 questions. Quizzes must be taken during the class, and no make-up quiz will be given for unexcused absences. A written note from the doctor/coach is required for an excused absence.

Homework: Homework will be 15-20 questions from the end of the chapter. All homework will be due the following class period unless otherwise instructed. Please see me if you need help with homework or classwork. Make an appointment with a 24-hour notice.

Laboratory Reports: Electronic laboratory reports will be encouraged to be "turned in" via



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Google Classroom. All lab reports are due after the completion of the lab with the assigned reports. Lab reports must include the following sections:

Name of student and any partners and date of lab (0.5 points)

Title of Lab (0.5 points)

Purpose of lab (0.5 points)

Introduction (2 points)

Background information/concepts covered by the lab

Materials and safety (0.5 points)

Procedure (not instructions) (1 point)

Results (2 points)

(may include one or more of the following weights, melting points, calculations, tables, charts, and spectra)

Discussions (2 points)

Explain how information from the results helps to verify the purpose. You may also suggest what you will do to avoid any failures and get better results.

Conclusion (2 points)

Summarize discussions, explain how the purpose was accomplished. Explain any errors and what should change if the lab were to be repeated for better results. Results only provide evidence to support or refute a claim; please avoid terms such as correct or proven.

Material in this course, in some instances, may be sensitive or emotionally provocative. As you review the syllabus, or at any time during the course, please let me know if you anticipate or are having a problem with any assignment or classroom activity. We can then discuss how this assignment or activity can be considered. We can also discuss extra help options and other resources that you may find helpful in dealing with your concerns.