

**SHS Accelerated Physical Science**  
**Mr. Chris Martin**  
**2015-2016**  
**[martin\\_chris@silverfalls.k12.or.us](mailto:martin_chris@silverfalls.k12.or.us)**

**Room: A203**  
**Google Class Code:**

### **Course Overview:**

Welcome to Accelerated Physical Science! Please expect this year to be both challenging and enlightening. This course is designed to familiarize students with the basic principles of entry-level physics and chemistry. We will be exploring the nature of science, the physical laws that govern our world, the states and composition of matter and general study skills that will become imperative to academic success in the future. The Accelerated Physical Science course will parallel the content and layout of the standard Physical Science course. However, the pace of the class will be more rigorous and we will delve into content more deeply. In the accelerated class you are expected to already have independent study skills and problem-solving abilities.

**Textbook:** *Science Spectrum: Physical Science* (Holt, Rinehart, & Winston)

**Notebook:** students are expected to keep a detailed **notebook** as well as a **3-ring binder** of all material covered in class. All worksheets/handouts will be kept by the student as study material. These will be graded based on completion.

### **Grading Policy:**

- Your weighted grade will be based on performance in the following categories:
  - Academic: (70% of grade)
    - Exams
    - Quizzes
    - Major Labs
  - Personal Management: (20% of grade)
    - Assigned work
    - Participation
  - Final: (10% of grade)
    - cumulative for semester

### **The Grading Scale is as follows:**

-90-100% = A  
-80-89% = B  
-70-79% = C  
-60-69% = D  
-0 -59% = F

### **Expectations**

- **Things I Value:**
  - **Respect.**
    - Respect your learning environment
    - Respect your instructor
    - Respect your peers. Work as a team.
  - Being on-time to class or scheduled meetings
  - Having class materials ready (or asking me if you don't have them)
- **Absences:** It is the student's responsibility, **not mine**, to find out which assignments were missed after an absence and make them up in a timely manner. Please check with me and do not rely on RIE to complete your work.

- If you are absent, your handouts will be available on Google Classroom or in the handout bin in the room.
- **Test Retakes:** If you need to retake a test because of a low score, you will have until the next unit test to complete your retake. You may not retake a test that you have already earned a “B” on. **Retakes are not your right. They are given at my discretion and will require extra work before they are granted.**
- **Late Work:** Assigned work (“homework”) under the ‘Personal Management’ grade will be accepted for ½ credit for one week after the original due date. Work turned in after this 1-week deadline will earn a ‘0.’ Academic exams, quizzes, and labs must all be made up within a reasonable span of time (depending on material) and must be coordinated with me in-person.
- **Self-advocacy:** you are a young adult and I will expect you to act as one. If you have concerns or questions regarding assignments, classroom policy, grading, redoes, etc. talk to me about them! It is sincerely my desire to see you succeed. I’m on your side. So please, before complaining to parents/peers about any issues you have, lets have a conversation and problem-solve together.
- **Classroom Rule #1: Talking.** If I am speaking to the entire class, please give me your full attention. If one of your classmates is addressing the entire class, please give him/her your full attention.
- **Classroom Rule #2: Drinks.** All drinks must be in a spill-proof container. This means that if your drink is knocked over, liquid will not spill out of the container.
- **Classroom Rule #3: Food.** You may snack in class, but the food (or the container it is in) cannot be loud. If I can smell it, you will have to put it away.
- **Classroom Rule #4: Electronics.** I will be very clear when it is appropriate to use your devices.

**Overview of Content by Next Gen. State Standards: (this is approximate and subject to change)**

### Semester 1: Chemistry

#### Atomic Structure and the Properties of Matter (3-4 weeks)

**PS1-1: Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.**

**PS1-2: Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.**

#### Types of Bonds (2-3 weeks)

**PS1-3: Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.**

**PS2-6: Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.\***

**PS1-4: Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.**

#### Chemical changes (reactions) (3-4 weeks)

**PS1-5: Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.**

**PS1-6: Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.\***

**PS1-7: Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.**

Nuclear Reactions (3 weeks)

**PS1-8: Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.**

**ESS1-3: Communicate scientific ideas about the way stars, over their life cycle, produce elements.**

**Semester 1 Final (10% of overall grade)**

**Semester 2**

Thermodynamics (2 weeks)

**PS3-2: Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative positions of particles (objects).**

**PS3-1: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.**

**\*ESS2-3: Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.**

**PS3-4: Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).**

Energy (4 weeks)

**PS3-1: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.**

**PS3-3: Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.\***

Newton's Laws (4 weeks)

**PS2-1: Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.**

**PS2-2: Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.**

**PS2-4: Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.**

**PS2-5: Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.**

Waves (3 weeks)

**PS4-1: Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.**

**PS4-3: Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.**

**PS4-5: Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.\***

**ESS1-2: Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.**

**\*ESS2-3: Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.**

Humanity's Effect on the Earth (2.5 weeks)

**\*ESS2-4: Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.**

**ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.**

**ESS3-2: Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.\***

**ESS3-3: Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.**

**ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.\***

**ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.**

**ESS3-6: Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.**

**Semester 2 Final**

**Getting Help:**

- I am available before and after school in Room A203. It is important in Physical Science to stay caught up, as we move at a brisk pace. All of my lecture notes and classroom resources (handouts/worksheets) will be posted on the Google Classroom. This will be a valuable resource to you so be sure you can access it.

**It is important that you read and understand this syllabus. Please take this home with you and to get it signed. You will then keep it as a reference in your 3-ring binder.**

Print Student's Name \_\_\_\_\_

Physical Science Period \_\_\_\_\_

Student Signature: \_\_\_\_\_

Parent Signature: \_\_\_\_\_