

## Wilson Area School District Planned Course Guide

**Title of planned course:** Introduction to Physical Science

**Subject Area:** Chemistry / Physics

**Grade Level:** 10 - 12

**Course Description:** This course is designed to be offered in conjunction with the Biology Remediation class to afford the opportunity for a remediating student to earn a full science credit for the year while also providing the necessary fundamentals and content to prepare them for chemistry and physics coursework which will be needed in subsequent years. The course will integrate core concepts integral to the physical sciences such as measurement, atomic structure, forces, and motion. Exposure to the laboratory and application of mathematics to our understanding of the natural world will also be emphasized.

**Time/Credit for this Course:** 0.5 years / 0.5 credits

**Curriculum Writing Committee:** Stewart, Evans, Browne, Grabowski, Johnson

## Curriculum Map

**Month 1:** Evolution of science and our understanding of the world.

**Month 2:** Measurement of physical and chemical properties

**Month 3:** Atomic Structure

**Month 4/5:** Forces and Motion

**Wilson Area School District  
Planned Course Materials**

**Course Title:** Introduction to Physical Science

**Supplemental Books:** The Martian

**Teacher Resources:** Laboratory Materials/Teacher Prepared Worksheets

## Curriculum Scope & Sequence

**Planned Course:** Introduction to Physical Science

**Unit 1:** Evolution of Science and Understanding

**Time Frame:** 3 weeks

**State Standards:** 3.3.10 B1; 3.3.10 B3; 3.4.10 B4; 3.2.10.A6

**Anchor or adopted anchor:** CHEM.A.1.1; CHEM.A.1.2; CHEM.A.1.2.1; CHEM.A.1.2.2; CHEM.A.1.2.3; CHEM.A.1.2.4; CHEM.A.1.2.5

**Essential Content/Objectives:** At the end of the unit, students will be able to:

- Compare the scientific method to that of philosophy and mathematics
- Create a timeline of our ever changing conception of the structure of the universe - what is matter, what is energy, basic universal laws
- Describe the difference between qualitative and quantitative measurements
- Describe and apply the scientific method and use it to write laboratory reports
- Describe the difference between chemistry and physics and how these physical sciences differ from the life sciences and how they interconnect

**Core Activities:** Students will complete/participate in the following:

- Direct Instruction Q/A
- Measuring in labs to demonstrate quantitative and qualitative observations.
- Student homework and classwork
- Creation of Lab Reports
- Background reading in “The Martian”

**Extensions:**

- Enrichment Questions for Advanced Students

**Remediation:**

- School developed and industry developed resource videos

**Instructional Methods:**

- Direct Instruction
- Teacher facilitated student learning
- Laboratory Work

**Materials & Resources:**

- Laboratory Materials
- The Martian Novel

**Assessments:**

- Quiz a day and Unit Exam

## Curriculum Scope & Sequence

**Planned Course:** Introduction to Physical Science

**Unit 2:** Measurement

**Time frame:** 4 weeks

**State Standards:** 3.2.10.A.6; 3.2.C.A3

**Anchor(s) or adopted anchor:** CHEM.A.1.1.3; CHEM.A.1.1.3

**Essential content/objectives:** At end of the unit, students will be able to:

- Understand the importance of units in scientific work
- Record data with the correct significant figures
- Identify the correct laboratory equipment to measure mass, volume, temperature, velocity, atmospheric pressure, and voltage
- Distinguish between physical and chemical properties
- Identify a material based on its properties
- Group materials based on their properties
- Define terms that pertain to laws of gravity, motion, conservation of mass, and the laws of thermodynamics
- Manipulate equations that describe natural laws and use them to calculate applicable variables
- Develop comfort and mastery with using mathematics as a tool to describe natural phenomena
- Graph variables properly and determine or describe a relationship

**Core Activities:** Students will complete/participate in the following:

- Direct Instruction Q/A
- Measuring in labs to demonstrate gravity, conservation of mass, and laws of thermodynamics
- Student homework and classwork
- Background reading in “The Martian”

**Extensions:**

- Enrichment Questions for Advanced Students

**Remediation:**

- School developed and industry developed resource videos

**Instructional Methods:**

- Direct Instruction
- Teacher facilitated student learning
- Laboratory Work

**Materials & Resources:**

- Laboratory Materials
- The Martian Novels

**Assessments:**

- Quiz a day and Unit Exam

## Curriculum Scope & Sequence

**Planned Course:** Introduction to Physical Science

**Unit 3:** Atomic Structure

**Time frame:** 4 weeks

**State Standards:** 3.2.10.A; 3.2.1.C.A2; 3.2.C.A1; 3.2.10.A4; 3.4.10.A

**Anchor(s) or adopted anchor:** CHEM.A.1.1.1; CHEM.A.1.1.4; CHEM.A.2.2.4

**Essential content/objectives:** At end of the unit, students will be able to:

- Describe the characteristics and support for the current quantum model of the atom
- Predict properties such as metallic character, size of radii, and reactivity based on atomic structure
- Compare and contrast the various types of matter in universe and how their differences relate to the atomic structure of the atoms from which it is composed
- Draw a proper model of the atom and energy diagram for an atom based off of the quantum model
- Describe how the principle of wavelike behavior and the interaction of matter with light has led to our understanding of matter
- Classify matter and propose methods to verify predictions.
- Group materials based on their properties

**Core Activities:** Students will complete/participate in the following:

- Direct Instruction Q/A
- Measuring in labs to demonstrate gravity, conservation of mass, and laws of thermodynamics
- Student homework and classwork
- Background reading in “The Martian”

**Extensions:**

- Enrichment Questions for Advanced Students

**Remediation:**

- School developed and industry developed resource videos

**Instructional Methods:**

- Direct Instruction
- Teacher facilitated student learning
- Laboratory Work

**Materials & Resources:**

- Laboratory Materials
- The Martian Novels

**Assessments:**

- Quiz a day and Unit Exam

## Curriculum Scope & Sequence

**Planned Course:** Introduction to Physical Science

**Unit: 4:** Laws of Motion and Forces

**Time frame:** 4 weeks

**State Standards:** 3.2.10.B.1; 3.2.P.B1; 3.2.P.B6; 3.2.12.B6

**Essential content/objectives:** At end of the unit, students will be able to:

- Calculate the velocity of an object before/after a force is applied
- Determine quantities such as force of gravity, mass, acceleration, distance, and time using Newton's second law
- Compare the different factors influencing law of gravitation and determine and compare gravitational force between different bodies
- Identify momentum and its conservation
- Describe the various potential forces operating on a body and the influences they have

**Core Activities:** Students will complete/participate in the following:

- Direct Instruction Q/A
- Measuring in labs to demonstrate gravity, conservation of mass, and laws of thermodynamics
- Student homework and classwork
- Background reading in "The Martian"

**Extensions:**

- Enrichment Questions for Advanced Students

**Remediation:**

- School developed and industry developed resource videos

**Instructional Methods:**

- Direct Instruction
- Teacher facilitated student learning
- Laboratory Work

**Materials & Resources:**

- Laboratory Materials
- The Martian Novels

**Assessments:**

- Quiz a day and Unit Exam