Physical Science (4000) Course Overview Curriculum Document

Course Description

This is a general science course with an emphasis on the integration of physical and chemical sciences. The course will provide students the opportunity to discover major science concepts while developing critical thinking skills. Laboratory work will be an integral part of this course. Students will explore many of the fascinating and exciting aspects of science that allow them to gain knowledge useful to functioning as a citizen in our technological world.

Credits	Prerequisites
1	None
Board Approved	**Revised**
June 2003	July 2004; June 2021; June 2022

Required Assessments

District-wide, standards-based common summative assessments

Textbooks/Resources

McLaughlin, C. W., Thompson, M., & Zike, D. (2021). *Inspire Physical Science*. Columbus, OH: McGraw-Hill Education.
ISBN: 978-0-07-668304-8

Course Essential Understandings

As a result of successfully completing this course, students will understand that:

- Forces impact motion of an object.
- Energy cannot be created or destroyed, it is only able to be transformed.
- Objects can have electric and/or magnetic fields which influence interactions with other objects.
- Waves can transfer energy and information.
- Matter is made of atoms and the properties of those atoms determine how that matter interacts with other matter.
- Substances combine/react with one another in order to make new substances.
- Matter is conserved during chemical reactions.

Course Relevance Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

- How are forces related to energy?
- How are matter and energy related?
- How can rules and relationships be used to predict what will happen in a system?

Unit Overviews

Unit Name	Unit Description	Unit Relevance Question	Instructional Standards	Assessed Standards
Unit 1 - Forces and Motion	Students will understand the basics of motion and how it changes in a system.	• How do you quantify motion? • How do forces impact motion? • What is inertia? • What happens when objects collide? • What is an impulse and how does it relate to collisions?	HS-PS2-3	HS-PS2-1 HS-PS2-2
Unit 2 - Energy	The energy unit will cover the different types of energy, the transformations between them, and electrical work and power.	• What is energy? • What are the most common types of energy? • How can types of energy be transformed? • What is the Law of Conservation of Energy? • How is energy use measured? • How can energy be used to do work?	HS-PS3-3 HS-PS3-4	HS-PS3-1
Unit 3 - Electricity and Magnetism	Students will understand electric and magnetic fields and how they interact with one another.	• Are electricity and magnetism the same thing? • What is electricity and how do we make it? • Why are some things magnetic and others are not? • How can we apply electricity and magnetism to create useful technologies?	HS-PS2-5	HS-PS3-5
Unit 4 - Waves	Students will understand how energy moves from place to place and how we can apply that knowledge.	• What is an electromagnetic wave? • What are the properties of waves? • How do waves interact? • How do electromagnetic waves affect living things? • What are some applications of wave technology?	HS-PS4-2 HS-PS4-4 HS-PS4-5	HS-PS4-1
Unit 5 - Properties of Matter and Atoms	Students will be able to understand the structure of an atom, how the periodic table is organized, and physical and chemical properties of matter.	• What are the key physical and chemical properties (ie. density, solubility, buoyancy, flammability, melting point, boiling point)? • How is the periodic table organized? • How can the periodic table be used to predict chemical properties? • What is happening at a molecular level during phase changes? • How are atoms put together?		HS-PS1-1
Unit 6 - Reactions	Students will understand how elements combine and change in different ways to store and release energy.	• Why might the properties of reactants and products differ? • Explain the outcome of a given chemical reaction. • How does bond type determine the properties of a substance? • How are fission and fusion similar and dissimilar?	HS-PS1-1 HS-PS1-3 HS-PS1-4 HS-PS1-5	HS-PS1-2 HS-PS1-7 HS-PS1-8