

*The Mission of the Chardon Local Schools is High Achievement
for All Students, Where Learning is Our Most Important Work.*

Science Course of Study:
PHYSICAL SCIENCE — *Honors*

Revised April 2022



Honors Physical Science

Committee Member: Dan Robertson

Learning Standards: Unit 1 - Study of Matter

PS.M.1: Classification of matter

- Heterogeneous vs. homogeneous
- Properties of matter
- States of matter and its changes

PS.M.2: Atoms

- Models of the atom (components)
- Ions (cations and anions)
- Isotopes

How Taught?

Teaching activities may include, but are not limited to:

- Students closely read select passages from documents to analyze text structure, development, and consequent meanings.
- Teacher provides direct instruction, give feedback, and model critical thinking
- Small group and class discussions.
- Pogil Activities
- Cooperative learning groups
- Students analyze video content related to standards that provide a broader global perspective of content.
- Design and conduct lab-based investigations that connect content to real-life experiences.
- Inquiry Labs
- Analysis of lab results, with focus on sources of error and how experimental designs may be improved.
- Small groups - White board problem solving and sharing
- Investigating alternative approaches to problem solving.
- Using technology and mathematics to improve investigations and communications.
- Utilize data to impact instruction

Materials:

- High School level Physical Science Text
- On-line video sources
- On-line simulations
- Lab equipment and chemicals
- Vernier probes and Labquests
- Gradecam/Google Forms
- Calculators

How Assessed?

Assessments may include, but are not limited to:

- Pre-Assessments (pre-tests, observation, questioning, diagnostics)
- Formative Assessments (mini analysis assignments, group work, discussions, homework/classwork, ap chem solutions worksheets, ap classroom videos and guided notes for videos, observations, quizzes, conferences, rubrics, study guides, progress checks from (AP Classroom), lab reports
- Summative Assessments (free response questions, using rubrics, multiple choice questions)

How Re-Taught?

Re-teaching activities may include, but are not limited to:

- descriptive feedback on original task/assessment
- student examples of expectations

	<ul style="list-style-type: none"> ● modeling ● student self assessments ● manipulatives ● presenting the information again in a different way ● review sessions ● graphic organizers ● small-group instruction ● practice activities ● computer tutorials / programs ● peer tutoring ● breaking down concept into smaller components ● cooperative learning ● Universal Design for Learning principles offering students opportunities to experience and engage material in new and different ways
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<p>Learning Standards: Unit 2 - Atomic Structure</p> <p>PS.M.2: Atoms</p> <ul style="list-style-type: none"> ● Models of the atom (components) ● Ions (cations and anions) ● Isotopes 	<p>How Taught?</p> <p>Teaching activities may include, but are not limited to:</p> <ul style="list-style-type: none"> ● Students closely read select passages from documents to analyze text structure, development, and consequent meanings. ● Teacher provides direct instruction, give feedback, and model critical thinking ● Small group and class discussions. ● Pogil Activities ● Cooperative learning groups ● Students analyze video content related to standards that provide a broader global perspective of content. ● Design and conduct lab-based investigations that connect content to real-life experiences. ● Inquiry Labs ● Analysis of lab results, with focus on sources of error and how experimental designs may be improved. ● Small groups - White board problem solving and sharing ● Investigating alternative approaches to problem solving. ● Using technology and mathematics to improve investigations and communications. ● Utilize data to impact instruction
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<p>Materials:</p> <ul style="list-style-type: none"> ● High School level Physical Science Text ● On-line video sources ● On-line simulations ● Lab equipment and chemicals 	<p>How Assessed?</p> <p>Assessments may include, but are not limited to:</p> <ul style="list-style-type: none"> ● Pre-Assessments (pre-tests, observation, questioning, diagnostics)
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- Vernier probes and Labquests
- Gradecam/Google Forms
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Learning Standards: Unit 3 - Organizing elements

PS.M.3: Periodic trends of the elements

- Periodic law
- Representative groups

PS.M.4: Bonding and compounds

- Bonding (ionic and covalent)
- Nomenclature

PS.M.5: Reactions of matter

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- **Chemical reactions**
- **Nuclear reactions**

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Learning Standards: Unit 4 - Bonding and Chemical reactions

PS.M.4: Bonding and compounds

- Bonding (ionic and covalent)
- Nomenclature

PS.M.5: Reactions of matter

- Chemical reactions
- Nuclear reactions

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<p>Learning Standards: Unit 5 - MOTION</p> <p>PS.FM.1: Motion</p> <ul style="list-style-type: none"> • Introduction to one-dimensional vectors • Displacement, velocity (constant, average and instantaneous) and acceleration • Interpreting position vs. time and velocity vs. time graphs 	<p>How Taught? Teaching activities may include, but are not limited to:</p> <ul style="list-style-type: none"> ● Students closely read select passages from documents to analyze text structure, development, and consequent meanings. ● Teacher provides direct instruction, give feedback, and model critical thinking ● Small group and class discussions. ● Pogil Activities ● Cooperative learning groups ● Students analyze video content related to standards that provide a broader global perspective of content. ● Design and conduct lab-based investigations that connect content to real-life experiences. ● Inquiry Labs ● Analysis of lab results, with focus on sources of error and how experimental designs may be improved. ● Small groups - White board problem solving and sharing ● Investigating alternative approaches to problem solving. ● Using technology and mathematics to improve investigations and communications. ● Utilize data to impact instruction
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Learning Standards: Unit 6 - FORCES**PS.FM.2: Forces**

- Force diagrams
- Types of forces (gravity, friction, normal, tension)

How Taught?

Teaching activities may include, but are not limited to:

- Students closely read select passages from documents to analyze text structure, development, and consequent meanings.

- Field model for forces at a distance
- PS.FM.3: Dynamics (how forces affect motion)**
- Objects at rest
 - Objects moving with constant velocity
 - Accelerating objects

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Learning Standards: Unit 7 - Energy

PS.EW: ENERGY AND WAVES

PS.EW.1: Conservation of energy

- Quantifying kinetic energy
- Quantifying gravitational potential energy

PS.EW.2: Transfer and transformation of energy (including work)

PS.EW.4: Thermal energy

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