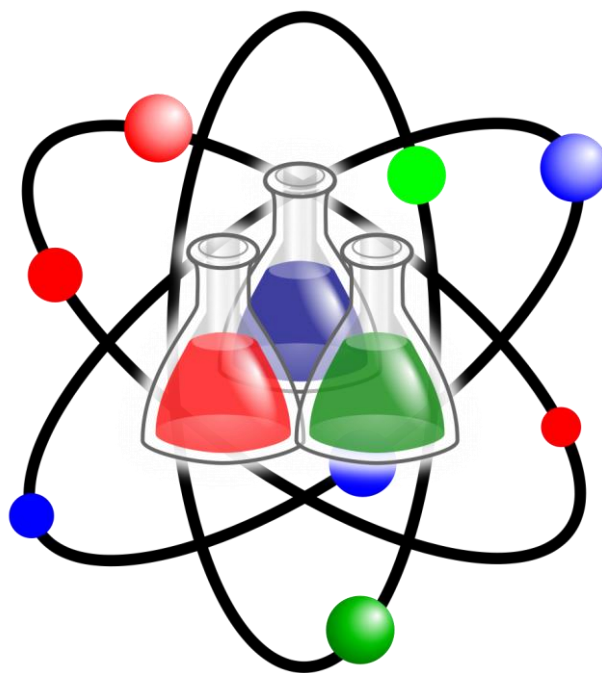




9TH GRADE PHYSICAL SCIENCE CURRICULUM WITH STANDARDS

Parma High School



2017

PARMA SCHOOL DISTRICT
Ketterling

Grade: 9
Subject: Physical Science
Unit: Problem solving
Lens:

Enduring Understandings

Guiding Questions

1. Observations are what we use to gather information in science. This information can then lead to questions which can be answered using a scientific approach to problem solving
2. The scientific method is one approach to solving problems in science
3. Inquiry and design is another approach to scientific problem solving where specific variables have yet to be identified.

1. What are the two types of data that can be gathered through observation?
2. What are the different variables that are manipulated when using the scientific method
3. What are the 3 possible outcomes of a properly written hypothesis
4. What is the difference between criteria and constraints and how do they influence the inquiry and design process?

Grade: 9			
Subject: Physical Science			
Unit: Problem Solving			
<i>Lens:</i>			
Critical Content and Skills		AC = Assessment Code:	Q – Quizzes O – Observations D – Dialogues T - Tests
Assessment			P - Prompts WS – Work Samples SA – Student Self-
Students will Know...	AC	Students will be able to do...	AC
1. The components to a properly designed scientific problem solving approach VOCAB Qualitative data Quantitative data Independent variable Dependent variable Variables Constants Control setup Experimental setup Hypothesis Criteria Constraints prototype		1. Design an experiment using the scientific method. 2. Conduct an experiment using the scientific method 3. Analyze the results of an experiment using the scientific method 4. Solve or test a problem using inquiry and design 5. Classify observations as qualitative or quantitative.	

Grade: 9
Subject: Physical Science
Unit: Measurements
Lens:

Enduring Understandings

Guiding Questions

1. The metric system is the accepted set of units used in the sciences.

1. What are the 7 fundamental properties and their metric standard that measures them?
2. What is the difference between precision and accuracy during the collection of quantitative data?
3. How do you convert from one unit to another within the metric system?
4. How do you concisely display quantitative data in various types of graphs?

Grade: 9
 Subject: Physical Science
 Unit: Measurements
 Lens:

AC = Assessment Code: **Q** – Quizzes **P** - Prompts
Critical Content and Skills **O** – Observations **WS** – Work Samples
 Assessment **D** – Dialogues **SA** – Student Self-
 T - Tests

Students will Know...	AC	Students will be able to do...	AC
1. The 7 fundamental units and their metric system unit 2. The difference between a fundamental and a derived property 3. The structure of a properly designed graph. 4. How to convert within the metric system VOCAB Property Unit Fundamental property Derived property Precision Accuracy Ordered pair Axis (x and y)		1. Collect data with both precision and accuracy using various laboratory tools and equipment. 2. Organize and display collected data using the metric system within an organized and concise graphical form 3. Convert from one metric unit to another. 4. Estimate quantities using metric units	

Grade: 9
Subject: Physical Science
Unit: Matter
Lens: Properties and Structure

Enduring Understandings

Guiding Questions

1. Atoms are the basic unit of matter
2. All matter can be classified into 4 groups
3. The behavior of matter within its three phases is based on the amount of energy each sample has

1. How does atomic structure help us to classify atoms?
2. How can we use physical and chemical properties to classify matter
3. How do atoms combine to make molecules?
4. How does matter change when energy is either added or removed?

Grade: 9
 Subject: Physical science
 Unit: Matter
 Lens:

AC = Assessment Code: **Q** – Quizzes **P** - Prompts
Critical Content and Skills **O** – Observations **WS** – Work Samples
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Students will Know...	AC	Students will be able to do...	AC
1. The consequences of adding and removing heat energy to a sample of matter 2. Basic characteristic properties that help us identify and classify matter VOCAB Volume Mass Characteristic property Density Weight Specific gravity Element Compound Mixture Solution Pure substance		1. Describe particle behavior in each of the 3 basic states of matter PS1-MS-4, PSC3-HS-3 2. Classify matter as an element, compound, mixture or solution based on observable properties (characteristic) and prior knowledge	

Grade: 9
Subject: Physical Science
Unit: Atomic structure
Lens:

Enduring Understandings	Guiding Questions
1. Atoms are the basic building block of all matter	1. What identifies the element to which an atom belongs? 2. What role do neutrons play in an atom's properties? 3. How are electrons arranged within both a neutral and charged atom? 4. How are atoms arranged on the periodic table?

Grade: 9
 Subject: Physical Science
 Unit: Atomic structure
 Lens:

AC = Assessment Code: **Q** – Quizzes **P** - Prompts
Critical Content and Skills **O** – Observations **WS** – Work Samples
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Students will Know...	AC	Students will be able to do...	AC
1. What the addition of protons does to an atom’s properties 2. What the addition of a neutron does to an atom’s properties 3. What the addition or removal of an electron does to an atom’s properties VOCAB Proton Neutron Electron Cation Anion Atomic number Atomic mass Mass number Isotope		1. Identify elements by atomic number PS1-MS-1 2. Determine mass number of an element based on certain given information 3. Predict the type of ion an atom will form based on its location on the periodic table PSC1-HS-1, PSC1-HS-2 4. Locate and name major sections of the periodic table 5. Make a model of two isotopes of a given element	

Grade: 9
Subject: Physical science
Unit: chemical bonds
Lens:

Enduring Understandings

Guiding Questions

1. The rearrangements of an atom's valence electrons determines what type of chemical reaction it will undergo and what type of bond (if any) it will form

1. What is the "preferred" arrangement of valence electrons in order for atoms to become stable?
2. What 3 things can an unstable atom do in order to become stable?
3. Using the location of an atom on the PT, can you predict what type of a bond the atom will be involved in?
4. How does the metallic bond describe common properties of metals?

Grade: 9 Subject: Physical Science Unit: chemical bonds <i>Lens:</i>			
AC = Assessment Code:		Q – Quizzes	P - Prompts
Critical Content and Skills		O – Observations	WS – Work Samples
Assessment		D – Dialogues	SA – Student Self-
		T - Tests	
Students will Know...	AC	Students will be able to do...	AC
1. How to use the periodic table to predict bond probability and type. VOCAB Valence electron Octet rule Electromagnetic force Electronegativity Polar Delocalized electrons		1. Determine the bond type and atom enters into. PS1-MS-1 PSC1-HS-3 PSC2-HS-1 2. Determine the atomic ratio of atoms in a compound PS1-M-1 PS1-MS-5 3. Describe basic properties of substances according to the type of bond that holds them together. PS1-MS-2, PS1-MS-5	

Grade: 9
Subject: Physical Science
Unit: Energy
Lens: Systems

Enduring Understandings

Guiding Questions

1. Energy Flows through Systems and is conserved.

1. What is the primary source of energy on earth?
2. What are the forms of energy?
3. How is energy converted between forms?
4. How is energy transferred?
5. If all energy is conserved, where does it go within a system?

Grade: 9 Subject: Physical Science Unit: Energy Lens: Systems			
AC = Assessment Code: Critical Content and Skills Assessment		Q – Quizzes O – Observations D – Dialogues T - Tests	P - Prompts WS – Work Samples SA – Student Self-
Students will Know...	AC	Students will be able to do...	AC
<ol style="list-style-type: none"> 1. Energy exists in different forms 2. Energy is transferred by conduction, convection, radiation 3. Energy is continually converted from one type to another and all can be traced back to the sun 4. Energy is transferred via waves 5. Energy is conserved as it flows through a system (Law of Conservation) <p>VOCAB</p> <p>Kinetic</p> <p>Mechanical</p> <p>Heat</p> <p>Sound</p> <p>Electromagnetic</p> <p>Light</p> <p>Electrical</p> <p>Potential</p> <p>Chemical</p> <p>Nuclear</p> <p>GPE</p> <p>Elastic</p>		<ol style="list-style-type: none"> 1. Create a model identifying the form of energy and its transfer through a system ultimately back to the sun. PSC3-HS-5, PSC3-HS-4 2. Design a device that converts one form of energy to another PS3-MS-2, PS3-MS-3 3. Site the two basic forms of energy and the specific examples of each 4. ID the two types of waves and give examples of energy that travels that way PS4-MS-1, PS4-MS-2 	

Grade: 9
Subject: Physical Science
Unit: Forces and Motion
Lens: Interactions

Enduring Understandings

Guiding Questions

1. A force is required to change motion
2. Motion can be measured

1. What kinds of forces act on objects?
2. How do net forces affect motion?
3. How do Newton's Laws describe motion?
4. What is the relationship between forces and energy?
5. How are speed and acceleration used to quantify motion?

Grade: 9 Subject: Physical Science Unit: Forces and Motion <i>Lens: Interactions</i>			
AC = Assessment Code:		Q – Quizzes	P - Prompts
Critical Content and Skills		O – Observations	WS – Work Samples
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		T - Tests	
Students will Know...	AC	Students will be able to do...	AC
<ul style="list-style-type: none"> 1. The motion of an object is determined by the net forces acting on it 2. Newton’s Laws describe the interaction of force and motion 3. There is a Relationship between potential energy, kinetic energy and motion 		<ul style="list-style-type: none"> 1. Create a model identifying the forces acting on an object PS2-MS-2 2. Design an experiment testing the laws of motion PSP1-HS-1, PS2-MS-4 3. Analyze and interpret graphs and data related to motion PS2-MS-4, PS2-MS-5 	

Grade:
Subject:
Unit:
Lens:

Enduring Understandings

Guiding Questions

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Grade:
 Subject:
 Unit:
 Lens:

AC = Assessment Code: **Q** – Quizzes **P** - Prompts
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Students will Know...	AC	Students will be able to do...	AC