

Course Syllabus
Jasper County Middle School 8th Grade Physical Science
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Course Description:

Science consists of a way of thinking and investigating, as well a growing body of knowledge about the natural world. To become literate in science, students need to possess sufficient understanding of fundamental science content knowledge, the ability to engage in the science and engineering practices, and to use scientific and technological information correctly. Technology should be infused into the curriculum and the safety of the student should always be foremost in instruction. The Physical Science Georgia Standards of Excellence are designed to continue student investigations of the physical sciences that began in grades K-8, and provide students the necessary skills to have a richer knowledge base in physical science. The standards in this course are designed as a survey of the core ideas in the physical sciences. Those core ideas will be studied in more depth during in the chemistry and physics courses. The physical science standards include abstract concepts such as the conceptualization of the structure of atoms and the role they play in determining the properties of materials, motion and forces, the conservation of energy and matter, wave behavior, electricity, and the relationship between electricity and magnetism. The idea of radioactive decay is limited to the understanding of whole half-lives and how a constant proportional rate of decay is consistent with declining measures that only gradually approach to zero. Students investigate physical science concepts through the study of phenomena, experiences in laboratory settings, and field work.

Instructional Goals:

The assessment of student performance is one of the most difficult and most important of all tasks performed by teachers. It begins with the identification of learning goals and subsequently involves diagnosis of student needs, provisions of effective instruction with feedback, and use of assessment results to improve learning. In fact, the best measure of effective teaching is student learning. This course is designed to provide students with the creative and critical thinking skills necessary to enhance learning. The course will address ways to assess higher order cognitive objectives and authentic tasks to improve literacy, mathematics and critical thinking skills. Students will participate in activities that enhance understanding of the physical world. They will participate in class discussion via online format to provide feedback to peers and develop an environment of learning. Documenting student performance and progress both for instructional and accountability purposes will be emphasized. Students will reflect and provide evidence of learning aligned to Georgia Standards of Excellence. **STEAM will be used to implement learning goals, instructional strategies, and assessment planning.**

Late Work Policy:

Late work will be accepted with a penalty. 10 points each day up to 5 days will be taken from the grade.

1 st QTR	2 nd QTR	3 rd QTR	4 th QTR
S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects. b. Construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object. c. Construct an argument from evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia). S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system. a. Analyze and interpret data to create graphical displays that illustrate the relationships of kinetic energy to mass and speed, and potential energy to mass and height of an object. b. Plan and carry out an investigation to explain the transformation between kinetic and potential energy within a system (e.g., roller coasters, pendulums, rubber bands, etc.). c. Construct an argument to support a claim about the type of energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)]. d. Plan and carry out investigations on the effects of heat transfer on molecular motion S8P5. Obtain, evaluate, and communicate information about gravity, electricity, and magnetism as major forces acting in nature a. Construct an argument using evidence to support	S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system a. Analyze and interpret data to create graphical displays that illustrate the relationships of kinetic energy to mass and speed, and potential energy to mass and height of an object. b. Plan and carry out an investigation to explain the transformation between kinetic and potential energy within a system (e.g., roller coasters, pendulums, rubber bands, etc.). c. Construct an argument to support a claim about the type of energy transformations within a system [e.g., lighting a match (light to heat), turning on a light (electrical to light)]. d. Plan and carry out investigations on the effects of heat transfer on molecular motion S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects. a. Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration. (Clarification statement: Students should be able to analyze motion graphs, but students should not be expected to calculate velocity or acceleration.) b. Construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object.	S8P2. Obtain, evaluate, and communicate information about the law of conservation of energy to develop arguments that energy can transform from one form to another within a system. d. Plan and carry out investigations on the effects of heat transfer on molecular motion as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or a gas (convection). S8P4. Obtain, evaluate, and communicate information to support the claim that electromagnetic (light) waves behave differently than mechanical (sound) waves. a. Ask questions to develop explanations about the similarities and differences between electromagnetic and mechanical waves. (Clarification statement: Include transverse and longitudinal waves and wave parts such as crest, trough, compressions, and rarefactions.) b. Construct an explanation using data to illustrate the relationship between the electromagnetic spectrum and energy. c. Design a device to illustrate practical applications of the electromagnetic spectrum (e.g., communication, medical, military). d. Develop and use a model to compare and contrast how light and sound waves are reflected, refracted, absorbed, diffracted or transmitted through various materials. (Clarification statement: Include echo and how color is seen but do not cover interference and scattering.)	S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter. a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures. (Clarification statement: Include heterogeneous and homogeneous mixtures. Types of bonds and compounds will be addressed in high school physical science.) b. Develop and use models to describe the movement of particles in solids, liquids, gases, and plasma states when thermal energy is added or removed. c. Plan and carry out investigations to compare and contrast chemical (i.e., reactivity, combustibility) and physical (i.e., density, melting point, boiling point) properties of matter. d. Construct an argument based on observational evidence to support the claim that when a change in a substance occurs, it can be classified as either chemical or physical. (Clarification statement: Evidence could include ability to separate mixtures, development of a gas, formation of a precipitate, change in energy, color, and/or form.) e. Develop models (e.g., atomic-level models, including drawings, and computer representations) by analyzing patterns within the periodic table that illustrate the structure, composition, and characteristics of atoms (protons, neutrons, and electrons) and simple molecules. f. Construct an explanation based on evidence to describe conservation of

the claim that fields (i.e., magnetic fields, gravitational fields, and electric fields) exist between objects exerting forces on each other even when the objects are not in contact.		e. Analyze and interpret data to predict patterns in the relationship between density of media and wave behavior (i.e., speed). f. Develop and use a model (e.g., simulations, graphs, illustrations) to predict and describe the relationships between wave properties (e.g., frequency, amplitude, and wavelength) and energy. g. Develop and use models to demonstrate the effects that lenses have on light (i.e., formation an image) and their possible technological applications. S8P5. Students will recognize characteristics of gravity, electricity, and magnetism as major kinds of forces acting in nature. b. Demonstrate the advantages and disadvantages of series and parallel circuits and how they transfer energy. c. Investigate and explain that electric currents and magnets can exert force on each other.	matter in a chemical reaction including the resulting differences between products and reactants. (Clarification statement: Evidence could include models such as balanced chemical equations.)
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Class Schedule/Procedures:

7:20-7:45 -- Breakfast
7:45- 8:00 -- Homeroom
8:05- 9:20 -- 1st Period
9:20-10:30 -- 2nd Period
10:30 - 11:40 -- 3rd Period
11:45- 12:55 -- 4th Period
1:00- 1:30 -- LUNCH
1:35-2:45 -- 5th Period
2:50 - 3:25 -- ACADEMY

RIT (about 10 minutes)

Opening (about 10 minutes)

Work/Student Activity Period (approximately 40 minutes)

Closing Activity/Wrap Up (approximately 10 min)

Texts and Resources:

Frank, D.V. (2009) Georgia Physical Science. Prentice Hall.

Hsu, T. C. (2007). *CPO physical science. Student ed.* CPO Science.

Supplemental readings will be required as needed throughout the course. These readings will include NewsELA articles, textbook readings, and research articles.

Internet resources are as follows: USA TestPrep, Quzzlet, YouTube, BrainPop, PhET, NewsELA, and Google Classroom. As technology changes so will we when it comes to using the Internet for resources.

Class Expectations:

_See student handbook for behavior/ discipline expectations and policies. Cell phones will be not allowed unless teacher gives permission. However, students are expected to be Prepared, Responsible, Independent, Dependable, and Engaged. Cane PRIDE!

Grading:

The grading policy is located in the student handbook.

Please sign and return to _____

Student Name_____

Class Period _____

X_____

Parent Signature

Parent Name (Printed) _____

Email Address: _____ Phone Number: _____