Harris County-Carver Middle School
2017-2018 8th Grade Gifted Physical Science Syllabus
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Please keep this syllabus in the front of your notebook at all times.

Infinite Campus: All students with internet access are encouraged to become registered users of Infinite Campus so that you may keep up with your grades in all classes. Have a smartphone? Download the app! District ID: HMYTHJ. Parents may register then access this information by going to our schools website and click the quick link for Parent Portal.

Conference Period: Mondays and Fridays 9:00 to 10:00 by appointment through the counselor's office (706) 628-4951.

Classroom Expectations:

- *All students are expected to arrive on time with all needed materials and bring agenda every day.*
- *All students are expected to follow the Electronic Devices policy- refer to Parent/Student Handbook.*
- *All students are expected to follow the Conduct/Discipline policy-refer to Parent/Student Handbook.*
- *All students are expected to stay current on any missed work-refer to Parent/Student Handbook.*

Course Description: The eighth grade gifted Science program is designed to develop a student's understanding of physical science concepts and how it relates to the world around them. This course acts as a bridge between previously learned concepts and new material to higher level concepts presented at the high school. The curriculum is taught using a variety of modalities to include investigations, technology, and research-based presentations. **Students are expected to demonstrate creativity and understanding based on original work and independent thought working within the cluster model classroom setting.**

Recommended Supplies:

- *Binder with 4 dividers (sections to include: Notes/Think Maps, Classwork/Homework, Labs, Review)…binder can be combined with another subject, Composition notebook **or** spiral notebook (for daily warm ups), Loose leaf paper, Graph paper, Pencils (wooden, no. 2), Cap erasers, Hand-held sharpener, Colored Pencils, Glue sticks, Ruler (metric)*
  **To keep at home - Poster board and markers- for take-home projects (1 performance task is assigned for each nine weeks)*

Grading Schedule:

- Test/Quizzes/Projects 25%
- Labs/Class work 45%
- Homework 15%
- 9weeks exams 15%

Units of Instruction:

Molecular Motion- →
S8P1. Structure and Properties of Matter
S8P2. d Heat Transfer

Special Projects: Physical & Chemical Properties & Changes, Design a Density Column, Research and make a time line of the history of the Periodic Table

Forces and Motion- →
S8P5. Electricity, Magnetism, Gravity
S8P3. Forces and Motion
S8P2. a, b Potential/Kinetic Energy

Special Projects: Balloon Car Racers, Electromagnets, Electroscopes, Circuits

Energy in Motion- →
S8P2. c Energy forms and Transformations
S8P4. Waves

Special Projects: Energy Transformation Web, Electromagnetic Wave Usage, Musical Instrument

Curriculum meets all National Science Standards and correlates to the Georgia Standards of Excellence. For your reference, all science standards of excellence are listed on the back.

I have read and understand the above syllabus.

Student Signature_____ **Parent Signature**_____

Science Georgia Standards of Excellence

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 matter in a chemical reaction including the resulting differences between products and reactants. (Clarification statement: Evidence could include models such as balanced chemical equations.)

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 as it relates to the collision of atoms (conduction), through space (radiation), or in currents in a liquid or a gas (convection).

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. 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).

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.) 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. Obtain, evaluate, and communicate information about gravity, electricity, and magnetism as major forces acting in nature. a. Construct an argument using evidence to support 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. b. Plan and carry out investigations to demonstrate the distribution of charge in conductors and insulators. (Clarification statement: Include conduction, induction, and friction.) c. Plan and carry out investigations to identify the factors (e.g., distance between objects, magnetic force produced by an electromagnet with varying number of wire turns, varying number or size of dry cells, and varying size of iron core) that affect the strength of electric and magnetic forces. (Clarification statement: Including, but not limited to, generators or motors.)