Course Title/Grade: Science 5

2018 - 2019 Course Syllabus
Prince George's County Public Schools

INSTRUCTOR INFORMATION		COURSE INFORMATION	
NAME:	Ms. Watson	**COURSE NUMBER:**	
E-MAIL ADDRESS:	kathy.watson@pgcps.org	**CLASS TIME:**	
		MEETING DAYS:	
SCHOOL:	Avalon	**ROOM:**	
SCHOOL PHONE NUMBER:	(301) 449-4970	**STUDENT TEXTBOOK/DIGITAL RESOURCES:**	Grade 5 Science Dimensions. (2017). Orlando, FL: Houghton Mifflin Harcourt. Digital Resource: Discovery Education Techbook™ Digital Textbooks.

Prerequisites Course: Science 4

Course Description: Fifth grade science students are actively engaged in a comprehensive science program as they build an understanding to make sense of the natural world through phenomenon-based instruction. Students will be interacting with content from different topics to include Earth and Space Science (ES), Life Science (LS), Physical Science (PS) and Engineering Design (ETS) Disciplinary Core Ideas (DCIs) from the Next Generation Science Standards (NGSS). Students are able to describe that matter is made of particles too small to be seen through the development of a model. Students develop an understanding of the idea that regardless of the type of change that matter undergoes, the total weight of matter is conserved. Students determine whether the mixing of two or more substances results in new substances. Through the development of a model using an example, students are able to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. They describe and graph data to provide evidence about the distribution of water on Earth. Students develop an understanding of the idea that plants get the materials they need for growth chiefly from air and water. Using models, students can describe the movement of matter among plants, animals, decomposers, and the environment and that energy in animals' food was once energy from the sun. Students are expected to develop an understanding of patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

The Crosscutting Concepts (CCCs) of patterns; cause and effect; scale, proportion, and quantity; energy and matter; and systems and systems models are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency with Science and Engineering Practices (SEPs) by asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students will conduct inquiry-based investigations through hands-on, digital and virtual laboratory experiences. Students will be introduced to various STEM careers while in grades K-12.

The new upcoming Maryland Integrated Science Assessment (MISA) will be administered in fifth grade. Content from this course will prepare students for the assessment.

PGCPS Elementary Science Policy: Grades 2-5

Overview: *The goal of grading and reporting is to provide the students with feedback that reflects their progress toward the mastery of the indicators and objectives found in the Science curriculum document.*

Please note: *For grades 3-5, the STEM fair process is designed for students to receive more than a single grade for the entire project. As such, various components of the STEM fair process can be used as classwork, homework and/or assessments.*

Factors	Brief Description	Grade Percentage Per Quarter
Classwork	This includes but is not limited to activities that involve: • Developing and using models • Engaging in argument from evidence • Individual and whole class discussions • Planning and carrying out investigations • Projects (include parts of the STEM Fair process) • Mandatory: 10% of classwork must be relevant hands-on and lab experiences • Asking questions (for science) and defining problems (for engineering) • Obtaining, evaluating, and communicating information • Constructing scientific explanations (for science) and designing solutions (for engineering)	**45%**
Homework	This includes but is not limited to assignments that involve: • Developing and using models • Obtaining, evaluating, and communicating information • Constructing scientific explanations (for science) and designing solutions (for engineering)	**15%**
Assessment	This includes but is not limited to assessments that involve: • Pre/post assessments, final exams, quizzes, final essays/reports, portfolios • Analyzing and interpreting data, using mathematics and computational thinking • Oral or written evaluation that reflects the student's performance on a summary of a lesson, chapter or unit • Final STEM Fair projects should also be used as an assessment grade. For students that do not participate, teachers will develop an alternative assignment to assess.	**40%**

Course Title/Grade: Science 5
Course Sequence: At-A-Glance

Actual pacing may differ slightly due to individual school schedules/events, testing, and calendar modifications. In support of the shifts and demands of the Next Generation Science Standards (NGSS), the Science and Engineering Practices (SEPs) and the Crosscutting Concepts (CCCs) are integrated to deliver each topic taught.

Each Unit focuses on making sense of Phenomena through the integration of 3-Dimensional teaching and learning. For purposes of our K-5 NGSS Curriculum, ***Sense-making*** *is defined as "the process by which the learner actively engages with the natural or designed world; wonders about it; and develops, tests, and refines ideas with peers and the teacher." (Schwarz, Passmore & Reiser, 2017).*

NOTE: *Students in grade 5 will be administered the Maryland Integrated Science Assessments (MISA). The tentative testing window for MISA from the Maryland State Department of Education is March 11 - 22, 2019. PARCC testing window is April 8-May 17, 2019.*

Grade 5

Quarter One - September 4, 2018 - November 2, 2018 (44 days)
Content To Be Taught:

- Comparing the Sun's Brightness to other Stars Relative Distance from Earth **(5ESS1-1)**
- Revealing Patterns of Shadows and Seasonal Appearances of Stars in the Night Sky **(5ESS1-2)**
- Supporting an Argument About Gravitational Force by Earth Object is Directed Down **(5PS2-1)**
- Developing a Model to Describe Ways the Geosphere Biosphere, Hydrosphere and Atmosphere Interact **(5ESS2-1) Mandatory 5th Grade MWEE Lesson**
- Graphing the Amounts and Percentages of Water and Fresh Water Distributed on Earth **(5ESS2-2)**
- Combining Information About Science Ideas to Protect Earth's Resource and Environment **(5ESS3-1)**

Quarter Two - November 3, 2018 - January 25, 2019 (47 days)
Content To Be Taught:

- Defining a Simple Design Problem with Specified Criteria for Success and Constraints on Materials, Time or Cost *(Engineering Design)* **(3-5ETS1-1)**
- Generating and Comparing Possible Solutions to a Program that Meet the Criteria and Constraints of the Problem *(Engineering Design)* **(3-5ETS1-2)**
- Developing a Model to Describe Matter is made Small Particles **(5PS1-1)**
- Observing and Measuring Materials Based on their Properties **(5PS1-3)**
- Measuring and Graphing Quantities To Provide Evidence that the Total Weight of Matter is Conserved **(5PS1-2)**
- **MISA Review Packet for Grade 5 (Highly Recommended)**

Quarter Three - January 26, 2019 - March 28, 2019 (43 days)
Content To Be Taught:

- Investigating to Determine the Mixing of Two or More Substance Results in New Substances **(5PS1-4)**
- Supporting an Argument that Plants Get Materials for Growth from Air and Water **(5LS1-1)**

Quarter Four - March 29, 2019 - June 14, 2019 (46 Days)
Content To Be Taught:

- Planning and Carrying Out Fair Test with Controlled Variable to Improve a Model or Prototype *(Engineering Design)* **(3-5ETS1-3)**
- Defining a Simple Design Problem with Specified Criteria for Success and Constraints on Materials, Time or Cost *(Engineering Design)* **(3-5ETS1-1)**

• Developing a Model to Describe the Movement of Matter Among Plants, Animals, Decomposers and the Environment **(5L2-1)** • Using Models to Describe that Energy in Animals' Food is from the Sun **(5PS3-1)** • **MISA REVIEW FOR GRADE 5 (Highly Recommended WINTER BREAK)** • **GRADE 5 LITERACY TASK: Revealing Patterns of Shadows and Seasonal Appearances of Stars in the Night Sky (5ESS1-2)** ***(This task will be implemented after MISA and before PARCC)***	• Generating and Comparing Possible Solutions to a Program that Meet the Criteria and Constraints of the Problem *(Engineering Design)* **(3-5ETS1-2)**

KIDS FOR SCIENCE (KFS) STEM FAIR For Grades 3-5

The 2019 Kids for Science (KFS) STEM Fair (county-wide) for grades 3-5, will be held at Eleanor Roosevelt High School Friday, May 17 - Saturday, May 18, 2019. Parents and guardians will have to speak with the School's STEM Fair Coordinator regarding their child's participation. Student must take part in their school-based STEM Fair in order to be considered for selection to KFS by the STEM Fair Coordinator and their committee.

Next Generation Science Standards Parents' Guide

https://www.nextgenscience.org/ and https://www.nextgenscience.org/parentguides

As the Next Generation Science Standards (NGSS) are implemented in PGCPS, they will enable students to: Develop a deeper understanding of science beyond memorizing facts, and Experience similar scientific and engineering practices as those used by professionals in the field.

How can you support your child's success?
Although this new approach to teaching and learning K–12 science is different than the past, you can still actively support your child's success in the classroom!

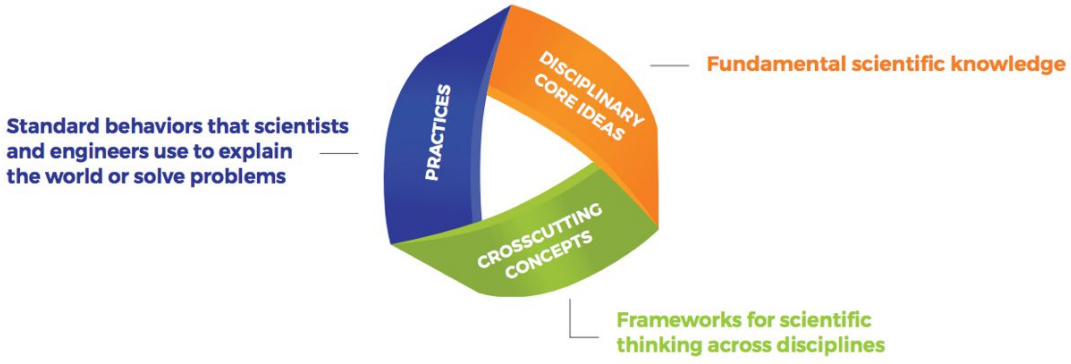
1. Speak to your child's teacher(s) or principal about how these important changes affect your school.	2. Ask your child's teacher thoughtful questions based on the information provided in this syllabus.	3. Learn how you can help the teacher(s) reinforce classroom instruction at home.

Next Generation Science Standards Performance Expectations (PEs)

Performance Expectations state what students should be able to do in order to demonstrate that they have met the standard, thus providing the same clear and specific targets for curriculum, instruction, and assessment.

Three Dimensional Learning (3D Learning)

The NGSS emphasizes three distinct, yet equally important dimensions that help students learn science. Each dimension is integrated into the NGSS and—combined—the three dimensions build a powerful foundation to help students build a cohesive understanding of science over time.



Dimension 1: Science and Engineering Practices (SEPs): *The practices describe behaviors that scientists engage in as they investigate and build models and theories about the natural world and the key set of engineering practices that engineers use as they design and build models and systems. This dimension emphasizes that engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice.*

1. Asking questions (for science) and defining problems (for engineering)

2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Dimension 2: Crosscutting Concepts (CCCs): *Crosscutting concepts describe concepts that bridge disciplinary boundaries, having explanatory value throughout much of science and engineering. These crosscutting concepts have application across all domains of science; they are a way of linking the different domains of science. The Framework emphasizes that these concepts need to be made explicit for students because they provide an organizational schema for interrelating knowledge from various science fields into a coherent and scientifically based view of the world.*

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function
7. Stability and change

Dimension 3: Disciplinary Core Ideas (DCIs): *Disciplinary core ideas have the power to focus K–12 science curriculum, instruction, and assessments on the most important aspects of science. To be considered core, the ideas met at least two of the following criteria and ideally all four:*

- *Have **broad importance** across multiple sciences or engineering disciplines or be a key organizing concept of a single discipline;*
- *Provide a **key tool** for understanding or investigating more complex ideas and solving problems;*
- *Relate to the **interests and life experiences of students** or be connected to societal or personal concerns that require scientific or technological knowledge;*
- *Be teachable and learnable over multiple grades at increasing levels of depth and sophistication.*
- *Disciplinary ideas are grouped in four major domains: physical sciences; the life sciences; the earth and space sciences; and engineering, technology and applications of science.*

Physical Sciences (PS)	***Life Sciences (LS)***
PS1: Matter and its interactions PS2: Motion and stability: Forces and interactions PS3: Energy PS4: Waves and their applications in technologies for information transfer	LS1: From molecules to organisms: Structures and processes LS2: Ecosystems: Interactions, energy, and dynamics LS3: Heredity: Inheritance and variation of traits LS4: Biological evolution: Unity and diversity

Earth and Space Sciences (ESS) ESS1: Earth's place in the universe ESS2: Earth's systems ESS3: Earth and human activity	***Engineering, Technology, and Applications of Science (ETS)*** ETS1: Engineering design ETS2: Links among engineering, technology, science, and society

FOR PARENTS/GUARDIANS
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Parents/guardians please sign this page and return your child's classroom teacher.

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Student's Name _____ **Parent's/Guardian's Signature** _____ **Date** _____