Chesapeake Math & IT Academy

CMIT South Biogeochemical Systems Syllabus 2018-2019

Teacher: Ms. Anna McAllister
Room: 332
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Course Description: This course is designed to illustrate the role of chemical processes, inclusive of photosynthesis and cellular respiration, in the cycling of carbon among Earth's spheres. Students will explore the study of matter and its interactions, motion, stability, and force through laboratory investigations, scientific discussions, and phenomena based instruction. Students will apply the science and engineering practices and crosscutting concepts of the Next Generation Science Standards (NGSS) to explain systems interactions: the flow of energy among organisms in an ecosystem, the control of weather and climate with a major emphasis on the mechanisms and implications of climate change, and the importance of biological and geophysical phenomena that support student explanations of chemical processes such as the release of energy. This course will involve students developing solutions to authentic problem-based science issues and investigations, while exploring career opportunities in Science, Technology, Engineering, and Mathematics (STEM). *Content from Biogeochemical Systems and the 9th Grade Biology course will be assessed on the High School Maryland Integrated Science Assessment (MISA).

- **Edmodo Codes:**

Section 101, 102, 103 : kucyet

- **Khan Academy Codes:**

Section 101 : 5PXBBQU4
Section 102 : NSWXFM9E
Section 103 : TE4GTNVV

Materials:

These items must be brought to class EVERYDAY

- See below for explanation on notes and note-taking
- Binder with dividers for ***handouts and returned assignments WITH loose leaf paper*** (PLEASE make sure you have a binder!). As an organizational tip please label binder dividers as follows
  - Warm-Ups (DNA)
  - Notes/Handouts
  - Homework / Classwork
  - Tests and Quizzes
  - Labs
- **Composition book (for classwork and labs) – this will stay in the classroom**
- **Scientific Calculator**

- ➢ Pens (blue or black) or Pencil and sharpener
- ➢ ***Set of colored pencils/ or crayons/ or thin multi-color markers***
- ➢ Glue stick
- ➢ Scissors

Students will need these additional materials regularly

- ➢ Internet and Computer Access (For notes, mandatory digital homework, and projects)
- ➢ Microsoft Office (Word) for writing papers/ lab reports

***If a student does not have the required materials on a daily basis, they may be docked SIS points for being unprepared to class. ***

Class Rules:

1. Respect yourself, others, and property
2. No food, drinks, or gum in the laboratory
3. Electronic devices must be turned off, and toys must stay in lockers
4. Be prepared and on time with a positive attitude
5. Raise your hand and wait to be acknowledged
6. Remain seated during class
7. Follow CMIT uniform policy

Consequences:

Students are expected to follow school and class rules. The following consequences will be issued if students choose not to comply with class rules.

- ➢ 1st Offense – Verbal and/or written warning
- ➢ 2nd Offense – Teacher/ Student Conference/Deduction of SIS points
- ➢ 3rd Offense – Parental Contact/Lunch Detention/Deduction of SIS points
- ➢ 4th Offense – Office Referral/Parental Contact

Rewards:

Wall of Fame: Students who earn high scores on assessments, and/or finish the quarter with a top SIS balance or grade in the class will be put on the wall of fame. With this reward, students will earn 10 tickets.

Students will also have the opportunity to earn tickets for outstanding work performed, and may use the tickets earned to the following privileges:

1. 3 Tickets: 5 points of Extra Credit on one Homework assignment
2. 5 Tickets: 5 points of Extra Credit on one Classwork assignment
3. 10 Tickets: 5 points of Extra Credit on one Assessment assignment

How to earn tickets?

- ➢ Students who go above and beyond to help classmates.

- ➢ Students who got perfect score (100%) on any quiz or test will receive a ticket.
- ➢ Students who show outstanding work in any classwork or class activity will receive a ticket.
- ➢ Additional incentives will be announced by Ms. McAllister along the school year.

Keys To Course Success

- ➢ ***Maintain your notebook! It WILL be graded and contains critical information, notes and handouts.***
- ➢ ***Study regularly***! Science is an intense subject that covers a broad range of topics and all concepts relate to one another- If you struggled with an early chapter- it will come up again in a later one.
- ➢ Keep up to date with the weekly science updates released by Ms. McAllister
- ➢ Ask for help if you need it! My classroom is almost always open to students for lunch tutoring.
- ➢ Work collaboratively, sometimes other students can explain something in a way I am not able to.

Ms. McAllister's Note-Taking

- ➢ Students are required to take notes during every class unless otherwise specified during that class.
- ➢ As noted above, students are required to have a binder or folder with loose leaf paper for notetaking.
- ➢ **Notes should include:**
  - o The date
  - o The topic of the day or continuation from the previous day
  - o Notes, questions, important information

Ms. McAllister's Assignments

- ➢ Students are required to submit all assignments by the assigned due date.
- ➢ I will make every effort to post all assignments and reminders online via Edmodo.
- ➢ For large assignments, I will send emails and post on the newsletter to remind parents and students of upcoming due-dates.
- ➢ All assignments must have name and class on them. Assignments with no name will not be graded and will result in a "0" with the comment "Not turned in" in SchoolMax.

Make-up Work:

If the student misses class with an excused absence, it is **his or her responsibility** to retrieve the missed work from **Ms. McAllister's Make – Up Work Folder**, and submit it within ***2 days*** of their return. ***Email notification is required for missed assignments so there is a written record of absence and request for work***. Work submitted past this deadline will not be accepted. (For example, if you missed school on Tuesday, you would pick up the work you missed on Wednesday, and hand it in by Friday.) If you are absent on a test or quiz day, you have 3 days from the date of your return to take the test.

Late work will not be accepted **without an excused absence**, and will be marked as a "**0**". This applies to homework assignments as well.

Absences and Tardiness
Students must present a valid note or pass to indicate that their absence from school is excused. Students will not receive credit for make-up work for unexcused absences. Students arriving late to class must bring an excused pass from the office or a teacher, and will be required to sign in on the tardy log.

Honor Code
Students are expected to abide by the Prince George's County Public Schools Code of Conduct at all times. Cheating, copying someone else's work, plagiarizing, sharing information about assessments, etc. will result in a grade of '0' on that assignment, followed by parent and administrator contract.

Grading Policy:
The grading scale that will be used in this class:
A (90%-100%); **B** (80%-89%); **C** (70%-79%); **D** (60-69); **E** (59% and below)

The final grade is based on the combination of three weighted categories: **classwork**, **homework**, and **assessment**. Please use School Max to check for grades.
*****Teacher reserves the right to decide which assignments to grade. *****
*****Do not ask for grade adjustments 72 hours before grades are due, missing work should be completed before this time*****

PGCPS Science Grading

Biogeochemical Systems

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 documents.

Please note: 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 all work completed in the classroom setting. Assignments may include, but are not limited to: ● Developing and using models ● Engaging in argument from evidence ● Individual and whole class discussions ● Planning and carrying out investigations	35%

	● Projects (include parts of the STEM Fair process) ● 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)	
Homework	This includes all work completed outside the classroom. Assignments may include, but are not limited to: ● Developing and using models ● Obtaining, evaluating, and communicating of information ● Constructing scientific explanations (for science) and designing solutions (for engineering)	15%
Assessment	This category entails both the traditional (exams and quizzes) and alternative (presentations, projects, portfolios) methods of assessing student learning: ● 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 a used as an assessment grade. For students that do not participate, teachers will develop an alternative assignment to assess. ***An instructional rubric should be created to outline the criteria for success and scoring for each alternative assessment.***	50%

Biogeochemical Systems
Course at a Glance

<table>
<tr><th>Quarter 1
September 4, 2018 - November 2, 2018 (44 days)</th><th>Quarter 2
November 5, 2018 - January 25, 2019 (47 days)</th></tr>
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Unit 1: The Big Bang Theory

Instructional Focus

- Construct an explanation of The Big Bang Theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.
- Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.
- Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.

Content Specifics

- The Big Bang Theory
- Earth and the Solar System
- Waves- Motions and Forces
- Evidence of Life
- Systemic Literacy Task

Assessments

- SLO Biogeochemical Systems Pre- Test
- Unit One PGCPS District Assessment
- Formative Assessment Systems Test (FAST-1)

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Unit 2: Earth's Properties

Instructional Focus

- Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.
- Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.
- Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
- Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

Content Specifics

- Earth's History
- Systems of Matter and Energy
- Plate Tectonics
- Earths' Changing Surfaces
- Earth's Waters

Assessments

- SLO Biogeochemical Systems Post- Test
- Unit Two PGCPS District Assessment
- Formative Assessment Systems Test (FAST-2)

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<tr><th>Quarter 3
January 28, 2019 - March 28, 2019 (43 days)</th><th>Quarter 4
March 29, 2019 - June 14, 2019 (46 days)</th></tr>
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Unit 3: Interactions of Earth's Systems

Instructional Focus

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Unit 4: Systems Thinking

Instructional Focus

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● Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. ● Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. ● Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. ● Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. **Content Specifics** ● Earth's Cycles (Interactions) ● Human Impact/Activity and Earth **Assessments** ● Unit Three PGCPS District Assessment	● Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations. ● Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system. ● Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution. **Content Specifics** ● Engineering, Technology, and Applications of Science ● High School Maryland Integrated Science Assessment Content Review (Life Science, Physical Science, and Earth and Space Science) **Assessments** ● High School Maryland Integrated Science Assessment ● Unit Four PGCPS District Assessment

Next Generation Science Standards Parents' Guide

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

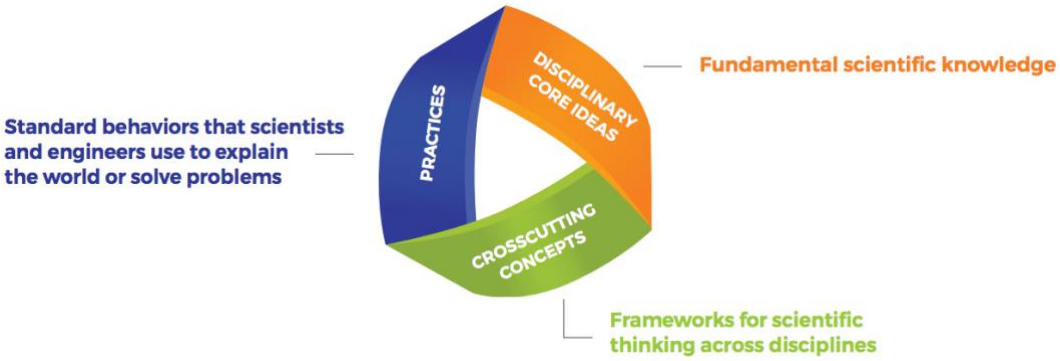
The Next Generation Science Standards (NGSS) enable students to: Develop a deeper understanding of science beyond memorizing facts, and Experience similar scientific and engineering practices as those used by professionals in the field.		
How can you support your child's success? Although this new approach to teaching and learning K–12 sciences 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.*

DCIs are grouped in four domains: the physical sciences; the life sciences; the earth and space sciences; and engineering, technology and applications of science.

Physical Sciences (PS)
PS1: Matter and its interactions
PS2: Motion and stability: Forces and interactions
PS3: Energy
PS4: Waves and their applications in technologies for information transfer

Life Sciences (LS)
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