Metropolitan Business Academy
PhyChem Science Course Syllabus and Overview

Teacher Contact:
Mr. Chris Willems willemsscience@gmail.com or chris.willems@nhboe.net **Phone:** (475) 220-7700

After school hours: check your weekly email update and outside room 408 for after school "office hours"

Course overview:
9th grade PhyChem science is about asking scientific questions, investigating, simulating, making models, collecting data, and making sense of data. Course topics include Earth's climate, protecting natural resources, learning and the brain and electricity. Students have many opportunities to explore additional science topics by completing an honors contract. See the final two pages of this syllabus for honors contract details.

New Haven Public Schools Science Competencies:
1. Questioning: Students can develop and use relevant scientific questions to investigate a phenomena, test a hypothesis, conduct an experiment or solve a problem
2. Investigation: Students can design and conduct appropriate scientific investigations
3. Modeling: Students can construct and use models to represent and analyze phenomena and systems
4. Data Analysis: Students can analyze and interpret scientific data and solve problems using a range of tools, technology and mathematical techniques
5. Explanation and Argumentation: Students can develop, evaluate and critique scientific claims/explanations, arguments and solutions based on evidence from the natural and designed world

New Haven Public Schools 21st Century Competencies:

1	Problem Solving and Critical Thinking	Reason effectively, make insightful judgments and decisions, solve problems
2	Accessing and Analyzing Information	Use research tools to access and evaluate information from multiple sources, organize and synthesize information using multiple methods
3	Communication and Collaboration	Articulate ideas clearly and effectively to a variety of audiences using multiple modes, communicate effectively and work productively with others
4	Creativity and Innovation	Demonstrate originality and inventiveness in work by implementing and sharing new ideas
5	Initiative, Self-Direction and Accountability	Set and meet high standards and goals for one's self and others, manage time and resources to produce high quality results in a timely manner, take responsibility for one's own learning
6	Citizenship and Responsibility	Exercise empathy and respect for diverse cultures and perspectives, contribute to and take responsibility for the larger community

PhyChem NHPS Preliminary Performance Task Chart:

Trimester Topics	Performance Task	NHPS Science Competencies	NHPS 21st Century Competencies
Science of Climate Change	Demonstrate an understanding of Earth's climates with models, simulations and data analysis.	#1, #2, #3, #4, #5	#1, #3, #4, #6
Human Impacts and Natural Resources	Use evidence to explain several Earth systems and the impacts resource use has on human activity. Create and explain a model that shows the cycling of matter through our Earth's environment.	#1, #2, #3, #5	#1, #2, #3, #4, #5, #6
Learning and Our Brain	Collect, graph, analyze and explain data brain science labs.	#1, #2, #4, #5	#1, #2, #3, #4, #5, #6
Our Need for Energy	Demonstrate the relationships among frequency, wavelength and speed of waves.	#1, #2, #3, #4, #5	#1, #2, #3, #4, #5, #6
The Energy Crisis: Reducing Human Impact on the Environment	Student-led investigation of energy conversions. Includes PBAT: Performance Based Assessment Task.	#1, #2, #3, #4, #5	#1, #2, #3, #4, #5, #6
Skills and performances that support performance tasks			
	Annotated Bibliography: Organized notes from learning and discussions about current scientific discoveries in media (text, audio, video).	#1, #2, #4, #5	#2, #3, #5
	Science Vocabulary: This improves our science writing and deepens our understanding.	#1, #4, #5	#2, #3, #5
	Graphing: Using numbers for clear explanations.	#3, #4	#2, #3, #4
	Lab Practice: Laboratory experiments, exercises, and field activities allow us to experience the process of scientific investigation	#1, #2, #3, #4, #5	#1, #2, #3, #4, #5, #6

Grade explanation and portfolio criteria: Each trimester, you will highlight examples of the best work in your portfolio. Revisions are essential for high quality performances, and are a critical part of your portfolio.

Trimester 1	Trimester 2	Trimester 3
Quizzes, annotated bibliographies, reflections on science learning, moderation study pre-PBAT, climate system performance tasks	Quizzes, annotated bibliographies, reflections on science learning on natural resources performance tasks, PBAT midterm and science roundtables	Quizzes, annotated bibliographies, reflections on science learning on waves, electromagnetism, brain performance task and energy conversions performance task, PBAT final with roundtables

Mastery Based Learning and Grading:

In Powerschool, you will see mastery codes, a green checkmark, a 0 or a dash.

-A green checkmark means the item is complete and has been handed in.

-A zero (0) and an orange dot means the item has not been turned in or completed, including absences.

-A dash (---) might appear in place of a green checkmark or other codes if you use certain types of cell phones, so we recommend checking your powerschool on a computer.

The mastery code meaning are below. Your goal is to reach competent or above on all major tasks for the year.

Mastery Language Abbreviations	**Progression to Meeting Standard**	**Standard Grading Equivalent**	**GPA (Grade Point Average)**
XE = Exemplary	Exceeds Standard with Distinction	100 = A+	4
CO-XE = Competent-Exemplary	Exceeds Standard (revise for exemplary)	93 = A	3.5
CO = Competent	Meets Standard (revise for exemplary)	85 = B	3
EM = Emerging	Approaches Standard (needs revision)	70 = C-	2
NY = Novice	Not Yet (needs revision)	60 = D-	1
NE = No Evidence	No Evidence of Work Yet	50 = F	---

Homework:

After class, regularly make time to review your notes and any of our class materials to reinforce your learning. Ask yourself questions about what you learned. Reflect on what you want to know more about. This will help shift your learning from "short term" memory to "long term" memory. We usually forget most of what we experience only one time, so practicing by reviewing will help you remember! Read science! There are great sources of terrific science writing all over the web and in popular books! If you don't already do pleasure reading in science, I strongly suggest you try it out! It's fascinating and will help you understand the world better. See me, your other teachers, or Ms. Cupole in the library for suggestions! Study for quizzes by testing yourself! Make up your own quiz, and then see how you do! If any performance grade is not competent or higher, use our feedback and make the time as soon as possible to fix it! Waiting is never a good strategy.

Honors Credit Opportunity:

Are you motivated to go further with your science learning? In the first trimester, you have the opportunity to sign an honors contract, that includes the exploration of a scientific question of your own choosing! For honors credit:

- Complete all PhyChem performance tasks at competent or higher (after revision)
- Do regular check-ins, including project updates with Mr. Willems and your science mentor if preparing for science fair
- A descriptive written summary of honor credit progress at the end of trimester 2
- A completed project by the end of May that meets the agreed-upon honors contract signed in trimester one.

Guidelines for PhyChem Honors Contract

An Honors Contract is a how students earn honors credit at Metropolitan Business Academy. The process involves "contracting" with the teacher to complete an honors performance. All of the terms stated in the contract must be successfully completed by agreed upon dates in order for the student to receive honors credit.

The PhyChem honors contract gives students a chance to learn and share more science! It allows the student to go into greater depth or explore addition topics beyond the non-honors course.

Time involved:
The honors credit contract is an additional time commitment. The student will schedule individual student meetings with Mr. Willems and/or science mentors. The details of these meetings will be arranged ahead of time.

Options include:

- Working with Mr. Willems to develop and present a mini-unit, including background and a laboratory activity
- An independent science research project with demonstrable results (for science fair or other external performance, if student wishes)
- Writing a major research paper, such as would be required for a science fair project and presenting the results of the learning to an audience
- A citizen science activity that supports an ecosystem or community which is important to the student
- Other project or performance that come from a conversation with Mr. Willems

Course topic:	What we are doing:
Science of Climate Change	Demonstrate an understanding of Earth's climates with models, simulations and data analysis.
Human Impacts and Natural Resources	Use evidence to explain several Earth systems and the impacts resource use has on human activity. Create and explain a model that shows the cycling of matter through our Earth's environment.
Learning and our Brain	Collect, graph, analyze and explain data from brain science labs.
Our Need for Energy	Demonstrate the relationships among frequency, wavelength and speed of waves.
The Energy Crisis: Reducing Human Impact on the Environment	Student-led investigation of energy conversions. Includes PBAT: Performance Based Assessment Task.

When is the Contract Complete?
The contract is complete when both teacher and student are satisfied that the performances have been done successfully.

PhyChem Honors Credit Contract

First and Last Name:_____ Date_____

Honors Credit Planning sheet for PhyChem Cosmos with Mr. Willems DUE BEFORE THANKSGIVING

Brief description of your honors contract project in PhyChem

**What do you want to do and learn as part of your honors contract?*

Please talk to Mr. Willems as you fill in this section

✓ #1: Plan for Honors Contract. By the end of November, I plan to:

✓ #2: At least ⅓ of way through contract work. Before the end of January, I plan to:

✓ #3: About ⅔ of way through contract work. Before the end of March, I plan to:

Once you have finished writing this first draft with Mr. Willems, please share a googledoc of your project with willemsscience@gmail.com including ✓ #1 in November, ✓ #2 in January and ✓ #3 in March

I look forward to your honors work in our class!