BOOKLET 1

Students' Booklet
AMS || **Teacher: Mr Bari** || **9/9/2015**

Topic: Overview of yearlong Regents Physics
Name/Period/Room#:

This booklet includes a Do Now, Worksheet, Data Assessment. All I expect from you guys is to pay attention & to take productive notes.

1.1 Do-Now Provide one line answer to the following questions.
1. What is Science?
2. What is Physics?
3. What is Mathematics?
4. What is the relationship between math and physics?
5. Name two topics you want to study in this course.

Welcome notes:

Welcome to our Physics Class!

My name is Mr. Bari. I'm a mathematician & physicist. I teach math at CUNY Baruch College. I recently joined at AMS to teach some Physics. So let me begin by asking you a question - what is Physics? Anyone want to explain the definition of physics, and its relation with math?

I will write student response in the box below:

I would define Physics as the science, which describes and explains the nature and the behavior of the world around us. **So how can you connect that with LC capacities?**

I will write student response in the box below:

My response after students' answers**: It's all about noticing deeply, you see.**

You go outside to a garden in a nice evening like today. You sit under a tree. All of a sudden you see an apple fall from a tree! What would you do? What would you see in the sky if you notice deeply? Say you see the moon. N**ow how can you connect that with LC capacities?**

I will write student response in the box below:

My response after students' answers**: It's all about posing questions, you see.**

You would probably ask a key question: if apple fall does the moon also fall? So how can you connect that with another LC capacities?

My response after students' answers**: It's all about making links, you see.** You would probably hypothesize it like this: **If apple fall does the moon also fall?** Okay, let's watch a movie to motivate ourselves. Movie link, https://www.youtube.com/watch?v=kewj4mu336Y

(2)
What is the apple made of? What is everything else made of? You look around, you know, and you see "stuff." What's it built out of? And, how does it work? When you push on something, how does it respond? How do we understand things that we can touch—like an apple? It's a pretty broad definition.

If Ms. Madison Kittleson and Ms. Marks were listening to this, they would probably say, "Hey, wait a minute, I'm doing biology. I'm describing and explaining the behavior of a living being." And I would agree. If Ms. Sugerman and Ms. Sizemore were listening to this, they say, "Hey, wait a minute, I'm doing Chemistry. I'm describing and explaining the behavior of chemical systems." And I would agree as well. In fact, I would say that's what all of science is doing. I think of Physics as sort of the underlying or fundamental science, upon which biology and chemistry and other sciences are building. Hence, if you do well in this class, you will perform well in Ms. Kittleson, Ms. Marks, Ms. Sugerman, Ms.. Sizemore and Mr. Lichoart classes.

If you're hiking on the Bear Mountain and you're doing some cool stuff, doing dance, spins and twists –are you doing Physics or are you doing biology or chemistry? I would argue that you're doing Physics. And the coach, Mr. Robollota, who wants to help you improve your health also applies physics. What are the fundamental laws, what are the primary ideas, how do we understand how things work and why they work the way they do. Now that to me is what Physics is about. So, when you have complicated systems – you might be doing Physics, you might be doing biology, you might be doing chemistry, and there's lots of room for **USING LINCLON CENTER CAPACITIES** to make connections. Let's look around the room. Make sure you notice deeply. What do you see?

There's computer, a projector. How the computer sends signals to the projectors so that it projects the information on the wall, which seems awfully complicated. Can Physics really help us understanding that complex system? There's more than just technology that Physics is trying to explain and help us to describe. How about the table, its color, its properties? Why is it hard? Why is your hand softer? Why is the air softer still, you can barely feel it. Physics is about all of these things. And so you can sort of feel like that one needs to be a direct descendants of Einstein to understand Physics. No, that's not true. In fact, it's quite the opposite!

Physics is about simplicity rather the complexity. Everything you see around us, computer, projector, table to the stars in the sky, have some underlying properties. We use science to test these properties and we use mathematics to explain them. And all of these properties can be understood just by knowing a few laws. That's what makes Physics so simple and beautiful. The person who really discovered and laid out these few basic laws that we need to understand was Isaac Newton. He's the hero of this course. I made a movie on him and I invite you to watch this movie. Please make sure to write the main idea of the movie.

Isaac Newton, in the late 1600's, was really just writing down a small set of laws, we'll call them Newton's Laws, and from these basic principals, we will be describing an awful lot of science. In this course, we're going to begin purely descriptively. We will begin with what's called kinematics. It's a fancy word for describing systems.

You need some sort of a language, an economical, efficient language that's quantitative – where is something? How fast is it moving? Which way is it going? So, that's the first step in understanding the world. But it's just the first step. It's by no means the end of the story. Just describing stuff isn't what we're about. We want to understand it. Newton's laws will help us really understand when you push on something and it accelerates. I can understand why and then, in much better detail, be able to explain and describe results of various physical experiments and physical systems. Once we've talked about forces and pushes and pulls, basically, we'll go on and we'll talk about more complex ideas, **Energy, Power, Momentum**.
You know, in the English language, people use those words as almost synonyms, but in Physics, we'll define them rigorously and they will be useful quantities, which we can use to help us to understand the behavior and the nature of physical systems.

In order to be quantitative, we will be using some math in this course. Nothing very fancy, I will be using some basic algebra, solving equations, you know, an equation with one unknown, maybe even two equations, and two unknowns. You draw a right triangle and I give an angle and the hypotenuse and I'll have to be able to find the other two sides. Pretty basic stuff.

When we have described and defined these new ideas, ideas like momentum and energy, then we're going to be able to start getting a little bit more realistic. When we start off, I'm a physicist, I really do like to keep things simple. I'm going to talk about point objects, with no friction. I'm going to make many, many approximations in the beginning to try to get at the essence of what's going on. But, once we understand that essence, then we can start adding all sorts of realistic complexity. We can add friction, that's part of Physics. We can talk, not about point like objects, but realistic objects, rigid bodies or human bodies, even fluids. We'll be able to describe the physics of fluids and even the waves, like waves on water. So, this is where we're headed. In fact, along the way, we will even discover that Newton's Laws, which are really the core of this course, have some very subtle issues. If you start pushing off to extremes, like super high velocity, then yes Newton's Laws begin to break down, only in those extreme cases is there anything that you have to fix up. And it was Albert Einstein who figured out what you need to do. And the basic picture is the same. A few new ideas introduced by Einstein and all of Physics, once again, becomes this sort of simple, coherent whole. So, I'm going to argue that Physics, as we go along, a very beautiful science. And I know that when you're working in a Physics course for the first time, you're saying "Beautiful? It looks to me like we've got a jillion equations and I'm plugging numbers in with my calculator." Don't lose the forest for the trees. The beauty of Physics is the simplicity, which underlies all of this. It's not about memorizing any equations and there's really only a few equations that you need and it's not really the equations, it's just these concepts. Newton's Laws and Einstein's additions to Newton's Laws, which allow us to quantitatively describe and understand, what are things made of, how do they work, why do they work that way?

1.3: What is CVMEA Model? Sample Topic: Atom			
Conceptual (C)	Visual (V)	Mathematics (M)	Algorithmic (A)
Student will work as a group to answer the question below:			
Q. What is Bhor Model (V)? Draw the Bhor Model for Boron (V)? And write the electron configuration (M)?			

1.4 A Brief overview of yearlong Physics Course!	
Main topic	Student will take important notes as I describe each thing from slides.
Overview of Student's Booklet	Every single Student booklet will be consist of following things: | | | | | | | | | |
A Brief overview of Syllabus	What are the Physics concepts we'll cover during the year" | T#1 | T#2 | T#3 | | | | |
A Brief Overview of Curriculum	Basic information about trimester? | | T #1 | T #2 | T# 3 | | Timeline | | | | | Days | | | | | Challenge | | | |
Goggle classroom overview	Why Google classroom would be useful?
AMS philosophies overview: Core values, habits of mind and LC capacities	| Core | Habits of mind | LC Capacities | | | | |
Graduation requirements overview	| Subs | Core English | Social Studies | Math | Science | Lote | Health | Art | Electives | | Credits | | | | | | | | | Regents Diploma | Subs | ELA | Math | SS | Science | Additional | | Score | | | | | |
Website and Programming overview	
Movie projects overview	
Homework and exams overview Essay writing assignment	

1.5: Assessment

Question	Answer
(1) What is booklet? How many items consist in a booklet? How often Mr. Bari will give me a Booklet?	
(2) What would we be mainly doing on Friday?	
(3) How many essay do you write for this class?	
(4) Why there is no HW on Friday?	
(5) What you need to bring every Monday?	
(6) What are the topics for T#1?	
(7) What is the T #1 Challenge?	
(8) How many essay due in T #1?	
(9) How many days we will meet in T#1?	
(10) What are AMS core values?	
(11) What are our Habits of Mind?	
(12) What are LC capacities?	
(13) Where will you find your HW?	