PISCATAWAY TOWNSHIP SCHOOLS
COURSE SYLLABUS

Course Title: Conceptual Physics
Textbook: Holt Physics, Serway and Faughn
Teacher: Mrs. Erin Bontempo
732-981-0700
ebontempo@pway.org
Extra help Wednesday after school, other days/times by appointment.

Course Description: **Conceptual Physics** is a 6 credit, full year course for students in grades 11 and 12. This is a lab and lecture course that meets six periods per cycle. This functional Physics course is fully aligned with the Next Generation Science Standards will focus on enhancing student's natural curiosity with understanding and application of scientific and engineering practices to explore and explain physical phenomenon. The class emphasizes inquiry student driven inquiry, science as a means of explaining observations, math as a modeling tool and language arts as essential for communication of results. Student performance is highly correlated to daily attendance, preparation and performance in class, ability to collaborate and communicate conceptual understanding of material and the ability to utilize multiple resources rather than a single text.

The following Physics course will give students an understanding of the physical laws governing force and motion, heat, waves, electricity, and optics.

Course Schedule: Scope and Sequence	
Approximate Time Frame	Topic
Marking Period 1 September through November	**Topics**: Measurement, Vectors, Graphic Analysis, Kinematics **Specific Content**: Definition of Physics Units and Dimensions Data collection, significant figures Graphic representation and addition of vector quantities. Vector Resolution Using trigonometric functions to resolve and add vectors. How to graph lab data to identify mathematical relationships. How to identify and express constant velocity and acceleration. How to express and identify distance-time and velocity-time relationships graphically. Galileo's study of free fall acceleration-the acceleration due to gravity. The equations of motion.
Marking Period Two November through January	**Topics:** Dynamics, Projectile Motion/Circular Motion, Angular Motion, Impulse and Momentum **Specific Content:** Newton's Laws of Motion. Describing motion in a curved path: application of both kinematics and dynamics. Radian measure. Kinematics and dynamics of rotating objects. The impulse-momentum theorem. Collisions and the law of conservation of momentum.

Second Semester	
Marking Period Three February through April	**Topics:** Work and Energy, Heat, Waves and Sound, Light and Reflection **Specific Content:** Definition of work. Simple Machines. The work-energy theorem. Gravitational potential energy, linear kinetic energy, rotational kinetic energy, Hooke's Law, and Elastic Potential energy. The Law of Conservation of mechanical energy. Non-mechanical forms of energy. Thermal energy, heat, and temperature. Specific heats and latent heats; calorimetry. Wave properties. Wave behaviors: rectilinear propagation, reflection, refraction, diffraction, and interference. The electromagnetic spectrum. The speed of light. The Law of Reflection and mirror optics.
Marking Period Four April through June	**Topics:** Refraction and Lenses, Interference and Diffraction, Electric Forces and Fields, Electrical Energy and Potential Difference, Electrical Current and Resistance, Electrical Circuits, Magnetism, Atomic Physics **Specific Content:** Snell's Law. Lens Optics Young's Law The wavelength of light. Coulomb's Law Static Electricity Electrical potential energy at different points in a field. The volt. The ampere. Ohm's Law. Drawing circuit diagrams. Series and parallel circuits. Magnetic Fields. Electromagnetism Models of the atom. Atomic spectra. Quantum Mechanics

Materials Provided:
- Textbook

Materials needed for <u>every</u> class:
- A notebook
- A scientific calculator (Note: Phones cannot be used. Sharing is not permitted for quizzes and tests.)
- Pencils, pens, and colored pencils or a highlighter

Computer access and Web Resources:
Students will need access to a computer to complete assignments and access web resources in and beyond the classroom. Students can access computers outside the classroom at various locations within the school during homeroom and after school. Students can also access computers at the public library.

Class Rules

1. Be on time and prepared to learn with book, pens, calculator, etc.
2. Be respectful of the teacher, students and classroom with your language and actions.
3. Follow directions the first time they are given.
4. No personal electronic devices should be used or visible during instruction unless given permission by the teacher.
5. No food or drink, this is a science laboratory.

Safety in the laboratory:

- When asked, you must wear safety goggles
- Personal apparel should be appropriate for lab work
- Know what you are doing
- Know the proper fire drill procedures and the locations of the fire exits and the emergency equipment
- Report all accidents to the instructor, no matter how minor
- Do not perform unauthorized experiments or use equipment and apparatus in a manner not specified by the instructor
- Stay alert in the lab
- Food and beverages are never allowed in the lab
- Use extra caution when working with electrical equipment
- Keep the work area clean and neat
- Soap and water are available
- If something seems unsafe, it probably is

*Observation of all Piscataway High School rules and regulations as noted in the official student handbook.

Classroom Procedures:

Entering classroom:

- Put any homework assignments, labs, etc. in correct class bin
- Put phone away
- Write down any homework assignment
- Begin Do Now

Leaving Classroom:

- All materials cleaned up and put back where they were
- Log off computers (if used)
- Push in chairs
- Wait to be dismissed

Disciplinary Action:

- First offense- warning
- Second offense- 15 minute teacher detention (before/after school, during lunch if needed)
- Third offense- Phone call home
- Fourth and each additional offense- Administrative write up

*Observation of all Piscataway High School rules and regulations as noted in the official student handbook.

Absences and Assignment Deadlines:

The class is based on in class group investigation. Absences should be avoided at all costs. Sometimes an absence is unavoidable. Students are then required to investigate the missed material on their own time.

Meeting deadlines is an important demonstration of responsibility. Students are encouraged to hand in all assignments when due. However, some assignments will be accepted late for reduced credit.

- If absent on an assignment due date, the assignment due date is extended by the number of consecutive days missed per school policy. Students missing only "test day". Should be prepared to take the test on the first day of return.
- Missed quizzes, labs and tests must be made up within 1 week.
- Homework is not accepted after the date checked.

- Lab reports and projects will be accepted late but at reduced credit. (-10 points) All assignments after 1 week late require a note from home upon submission for grading. No assignment will be accepted after 2 weeks or the announced last due date for the assignment or marking period.

Grading Distribution:
Students will be assessed on a variety of assignment (labs, projects, homework, class work), exams (tests and quizzes), and class participation. Each graded assignment will have points assigned. A student's grade for the marking period is determined by the percentage of points earned /points available within a particular category. While an individual marking period may vary, the target point weights for each category is given below.

- Class Participation: 15%
- Classwork/Homework: 15%
- Tests/Quizzes: 40%
- Labs/Projects: 30%

*Extra credit assignments are available relating to physics in our daily lives, current events or science careers upon need for improvement.

NOTE: PLEASE do not wait to ask for help! I am here to help YOU understand and learn. Asking for help shows me that you are a serious student, concerned about learning, and that goes a long way. If you are planning on staying for extra help, please let me know in advance.

Please return form for HW grade.

Please note student and parent email addresses are very important!!!

Student Name:_____ Class Period _____

I have read and understand the syllabus for Conteptual Physics.

_____ _____

Student name printed Student signature

_____ _____

Parent/guardian name printed **Parent/guardian signature**

	Preferred number during school hours	**Parent/Guardian 1 Information Name**	**Parent/Guardian 2 Information Name**	**Student Information**
Home phone number				
Work phone number				
Cell phone number				
Email address *important				

Does student have Asthma or Allergies?_____

For the students:
What do you like most about science?

Complete the sentence:
In physics class I hope to _____.

What extra-curricular activities are you involved in? (Jobs, sports, clubs, etc.)?

What are you planning on doing after you graduate from high school?

What are you planning on doing for a career?

Please share any additional information you feel pertinent to this science class.

I am glad you are in my class and I am looking forward to helping you achieve your goals.

Sincerely,

Mrs. Bontempo