



# Course Syllabus

Insert School Name Here  
Physics First  
2017-18

## **Instructor Information**

Include Name, Phone, Email

## **Course Description:**

This laboratory science course is designed to teach experimental methods by using the scientific method and measurements to be logged into a Physics notebook. Physics First is lab-based and will help students implement mathematical applications as well as develop the skills needed to write lab reports. Then, students will use this introduction to discover concepts in the themes of motion, forces, mechanical energy, thermal energy, wave energy and electromagnetic energy. Skills learned in this course would benefit the student as they continue into other high school science courses. Algebra will be used frequently throughout this course.

## **Course Units:**

### **Semester 1**

- Introduction to Science: experimental methods, scientific method and measurements
  - Labs: Scientific Method
  - Labs: Measurement
  - Measurement Lab Practical
- Motion
  - Labs: Measuring Constant Motion
  - Labs: Measuring Accelerated Motion
- Forces in Motion
  - Labs: Newton's Laws
  - Labs: Gravitation
  - Lab: Egg Drop

Straw Rocket Project: Project Design/redesign and written report

## Semester 2

- Mechanical Energy: Work, Power, and Machines
  - Labs: Work and Power
  - Labs: Simple Machines, Efficiency and Mechanical Advantage
- Thermal Energy
  - Labs: Laws of Thermodynamics
- Wave energy
  - Labs: Waves tables
- Electromagnetic energy
  - Labs: Electricity
  - Labs: Magnetism

Roller Coaster Project: Project Design/redesign, and written report.

### **Required Materials:**

- Notebook/paper
- Individual Learning Device
- Pens or Pencils
- Calculator

### **Grading Policy:**

Weighted Grading or Total Points, Late Work Policy in accordance with SB100.

#### Grading Scale

|         |   |
|---------|---|
| 100-90% | A |
| 89-80%  | B |
| 79-70%  | C |
| 69-60%  | D |
| 59% >   | F |

Grades for this class are weighted as follows:

|                |     |
|----------------|-----|
| Test & Quizzes | 60% |
| Labs           | 25% |
| Assignments    | 15% |

### **Learning Standards:**

#### 1st Semester

- Students will demonstrate an understanding of interaction of forces by using mathematical expressions to determine the relationships between the variables in the law of gravitation.
  - Common Core Standard: ELA- RI.9-10.8, SL.9-10.4
  - Common Core Standard: Math – HSN-Q.A.1, 2, 3
  - Next Generation or State Standard: HS.PS2-3,4

- Students will demonstrate an understanding of forces and motion by using algebraic equations to predict the velocities of objects and interaction and generate data to support the claim of the total momentum of a closed system of objects before interaction is the same as the total momentum of objects after interaction.
  - Common Core Standard: ELA- RST.9-10.7
  - Common Core Standard: Math – HSN-Q.A.1, 2, 3, HSA-CED.A.4,
  - Next Generation or State Standard: HS.PS2-2
- Students will demonstrate an understanding of force by planning and carrying out investigations to show that the algebraic formulations Newton’s second law of motion accurately predicts the relationship between net force on macroscopic objects, their mass and acceleration and the resulting change in motion.
  - Common Core Standard: ELA- RST.9-10.7
  - Common Core Standard: Math – HSN-Q.A.1, 2, 3, HSA-CED.A.4, HSF-IF.C.7
  - Next Generation or State Standard: HS.PS2-1
- Students will demonstrate an understanding of energy by design, build, or evaluate devices that convert one form of energy to another form of energy.
  - Common Core Standard: ELA- RST.9-10.7
  - Common Core Standard: Math – HSN-Q.A.1, 2, 3
  - Next Generation or State Standard: HS.PS3-3

## 2nd Semester

- Students will demonstrate an understanding of energy by design, build, or evaluate devices that convert one form of energy to another form of energy.
  - Common Core Standard: ELA- RST.9-10.7
  - Common Core Standard: Math – HSN-Q.A.1, 2, 3
  - Next Generation or State Standard: HS.PS3-3
- Students will demonstrate an understanding of energy by constructing representations that show energy is transformed and transferred.
  - Common Core Standard: ELA- RST.9-10.7
  - Common Core Standard: Math – HSN-Q.A.1, 2, 3
  - Next Generation or State Standard: HS.PS3-3
- Students will demonstrate an understanding of waves by planning and carrying investigations to determine the mathematical relationship between wave speed, frequency, and wavelength and how they are affected by the medium through which the waves travels.
  - Common Core Standard: ELA- RST.9-10.3,7, SL.1c
  - Common Core Standard: Math – HSA-SSE.A.1,HSA-SSE.B.3, HSA-CDE.A.4
  - Next Generation or State Standard: HS.PS4-1
- Students will demonstrate an understanding of interaction of forces by using mathematical expressions to determine the relationships between the variables in Coulomb’s Law.
  - Common Core Standard: ELA- RI.9-10.8, SL.9-10.4
  - Common Core Standard: Math – HSN-Q.A.1, 2, 3
  - Next Generation or State Standard: HS.PS2-3,4
- Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
  - Next Generation or State Standard: HS.PS3-4

**Behavior Expectations:**

Please refer to the teacher's Classroom Expectations.

**Original Work, Cheating, Plagiarism, and Paraphrasing Policy :**

Please refer to DPS61 Handbook and Code of Conduct.

**I have read and understand the attached syllabus and course guidelines for Physics First.**

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Student Name (print)

Signature

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Parent/Guardian Signature