SAMPLE SYLLABUS #1

AP® Physics 1

Curricular Requirements

CR1	Students and teachers have access to college-level resources, including a college-level textbook and reference materials in print or electronic format.	*See page:* 2
CR2	The course provides opportunities to develop student understanding of the required content outlined in each of the units described in the AP Physics 1 Course and Exam Description.	*See page:* 2
CR3	The course provides opportunities for students to develop the skills related to Science Practice 1: Creating Representations.	*See page:* 2
CR4	The course provides opportunities for students to develop the skills related to Science Practice 2: Mathematical Routines.	*See page:* 2
CR5	The course provides opportunities for students to develop the skills related to Science Practice 3: Scientific Questioning & Argumentation.	*See page:* 3
CR6	Students spend a minimum of 25% of instructional time engaged in hands-on laboratory investigations.	*See page:* 3
CR7	Students engage in hands-on laboratory investigations representative of the topics outlined in the AP Physics 1 Course and Exam Description.	*See page:* 3
CR8	The course provides opportunities for students to record evidence of their scientific investigations in a portfolio of lab reports or a lab notebook (print or digital format).	*See page:* 3

Advanced Placement Physics 1 Sample Syllabus #1

The AP® Physics 1 course is conducted using inquiry-based instructional strategies that focus on experimentation to develop the student's conceptual understanding of physics principles. This syllabus has been designed to follow the eight curricular requirements (CRs) set by College Board for the Physics 1 course. These CRs are listed in the table below. Evidence of meeting the CRs will be shown on the pages that follow

Textbook provided on the AP Course Audit form. **CR1**

The AP Physics 1 course will follow the outlines for units of study as presented in the AP Physics 1 Course and Exam Description. These units are: **CR2**

Unit 1: Kinematics

Unit 2: Force and Translational Dynamics

Unit 3: Work, Energy, and Power

Unit 4: Linear Momentum

Unit 5: Torque and Rotational Dynamics

Unit 6: Energy and Momentum of Rotating Systems

Unit 7: Oscillations

Unit 8: Fluids

CR2
The syllabus must include an outline of course content by unit title to demonstrate the inclusion of the required course content listed in the current AP Physics 1 Course and Exam Description.

Science Practice 1 CR3

Within each unit, students will complete at least one problem-solving activity that involves the use of multiple representations.

For Unit 1: Kinematics, students will be asked to:

- Analyze position vs. time data in order describe the motion of the object. This analysis will include correctly plotting data on a quantitative graph with appropriate axis scaling and units.
- Use a verbal description, motion map, diagram, or chart to create a qualitative sketch of a motion graph that would correlate with the information that has been provided.

CR3
The syllabus must include a section labeled "Science Practice 1" describing one assignment, activity, or lab where students create representations that depict physical phenomena.

Science Practice 2 CR4

Within each unit, students will complete at least one problem-solving activity or lab that requires or demonstrates an appropriate use of mathematics to answer questions.

For Unit 1: Kinematics, students will be asked to:

- Analyze the collected experimental data using graphing, calculations, and regression analysis.
- Determine the significance of the slope derived from the regression analysis.

CR4
The syllabus must include a section labeled "Science Practice 2" describing one assignment, activity, or lab where students use mathematical routines.

Science Practice 3 CR5

Within each unit, students will complete at least one activity or lab that requires the use of student-designed experimental procedures, data analysis, and supporting claims.

For Unit 2: Forces, students will be asked to:

- Design an experiment to determine the relationship between the amount of force applied to an object and the resulting acceleration.

25% of this class will be spent designing, performing, and analyzing hands-on laboratory investigations. CR6 Labs will be incorporated into instruction using inquiry methods when appropriate in the lesson cycle. All student-designed lab procedures will be approved by the instructor prior to data collection. When students perform each lab investigation, they will submit their report (either in full or in part as per instructions) to their instructor either digitally or through the maintenance of a lab notebook. CR8 The following labs will be done in this course: CR7

- Buggy Lab: Students will collect position vs. time data for constant velocity vehicles to determine a collision time and location.
- Flying Pig Lab: Students will use flying pigs to investigate the relationship between radius and tangential velocity, centripetal acceleration, and centripetal force.
- Bullseye Lab: Students will predict the landing spot of a projectile moving in two dimensions.
- Free Fall Lab: Students will determine the acceleration due to gravity in the classroom using G-balls.
- Newton's Second Law Lab: Students will use carts, tracks, and probe ware to determine the relationship between net force and acceleration and the relationship between mass and acceleration, resulting in the derivation of Newton's second law.
- Popper Height: Students will use poppers and energy concepts to determine the launch speed of the popper.
- Collision Carts: Students will use collision carts and probe ware to verify conservation of linear momentum.
- Mass of a Meter Stick: Students will use torque concepts to determine the mass of a meter stick experimentally.
- Spring Constant: Students determine the spring constant of a spring using oscillatory motion concepts.
- Density: Students use buoyancy concepts to determine the density of an irregularly shaped object.
- Water Sprayer Continuity: Students use continuity concepts to determine the exit velocity of a stream of water.
- Bernoulli Bottles: Students use Bernoulli's law to determine the landing spot of a stream of water.

CR5
The syllabus must include a section labeled "Science Practice 3" describing one assignment, activity, or lab where students design experimental procedures, and make and justify claims.

CR6
The syllabus must include an explicit statement that at least 25% of instructional time is spent engaged in hands-on laboratory investigations, with an emphasis on inquiry-based labs.

CR7
The syllabus must include a title and brief description for each laboratory investigation. The labs listed should be representative of the topics outlined in the AP Physics 1 Course and Exam Description.

CR8
The syllabus must include an explicit statement that students are required to maintain a lab notebook or portfolio (hard copy or electronic) that includes all their lab reports.