

# Physics of the Universe Courses at PHS

Dear Students and Parents, below is a brief description of the physics courses being offered next year. Please read through the description to gain a better understanding of the goals and expectations of these exciting courses.

## Course Overview

These physics courses are the end of the three course sequence adopted in 2016. Both physics courses follow the California Next Generation Science Standards as delineated by the three course model in Chapter 7 of the California 2016 Science Framework. To this end, the focal discipline is physics with disciplinary core ideas (DCIs) from earth and space sciences are integrated to ensure that, over the three years of science, Piedmont High School students will have had the opportunity to learn all of the disciplinary core ideas described in the standards while developing proficiency in the science and engineering practices (SEPs) in the context of the crosscutting concepts (CCC). Here is a video to help you visualize what is meant by [Three Dimensional Learning](#). You can access from Mrs. Chamberlain's webpage at PHS.

Throughout these courses, students will engage with phenomena and design challenges to make sense of abstract physical principles, such as wave/particle duality and electromagnetic fields, and complex earth and space science phenomena, such as stellar evolution and Earth's internal structure. The rigor will prepare students for collegiate studies in physics and for engaging in civic discourse around socio-scientific issues, such as human impacts on the environment. Students will demonstrate their ability to use this knowledge in a wide range of formative and summative assessment tasks including laboratory experiments, discussions, debates, quizzes, individual and group projects, essays, and exams.

The Honors Physics of the Universe course includes the foundational phenomena and themes of the standard Physics of the Universe course but **increases the conceptual demand** on students. For example, the California NGSS clearly state in the assessment boundary that calculations using Newton's first law are "limited to one-dimensional motion and to macroscopic objects moving at non-relativistic speeds." This guideline is followed in the standard Physics of the Universe course, while in the the Honors Physics of the Universe course, students calculate forces in two dimensions and explore the meaning of Einstein's famous equation describing special relativity. **Honors students will receive less scaffolding** for concepts that are taught than students who take the college prep Physics of the Universe course. Students in Honors Physics will learn the content at an **accelerated pace** in order to achieve a deeper level of conceptual understanding and engage at a more sophisticated level in the science and engineering practices.

Below is a chart outlining aspects of the course for students' consideration. After reviewing the differences between the college prep Physics of the Universe and Honors Physics of the Universe, students are encouraged to follow the directions provided for completing the self-assessment.

Component	Physics of the Universe	Honors Physics of the Universe
Content	Assessment boundaries will be limited to the depth covered on each standard	Beyond the assessment boundaries set by the framework as illustrated in the above example. This will not be equivalent to an AP Physics course.
Student expectations	Students are expected to be motivated learners who investigate physics phenomena through hands on activities, projects and text.	Independent learners who have genuine curiosity about physics. Students will develop an expertise beyond the standards. Act as knowledge partners by researching authentic questions and develop lessons to teach others.
HW Workload	3x/week, students will be expected to spend on average 15 minutes.	3x/week, students will be expected to spend on average 45 - 60 minutes.
Teaching modes	Students will learn the majority of	<b>Flipped classroom:</b>

Teaching modes	content in class and then go into depth through text & visual source analysis, other interactive in-class activities, discussion, homework, and larger projects.	Students are introduced and practice content through independent reading and video at home. Student independence is essential. Students need to have the curiosity and aptitude for look for additional materials online. In class there will be additional explanation through investigations, discussion, and debate. <b>Students should expect little time in class dedicated to direct teacher instruction.</b>
Formative and Summative Assessments	In-class assignments, homework, discussions/debates, projects, tests, essays, scientific notebook edits, laboratory work.	Primary text and visual source analysis, discussion, debate, projects, laboratory work, white board and gallery walks.
Standard Based Grading	Weekly and bi-weekly assessments will be graded for mastery of the standards.	Summative assessments are opportunities for students to show mastery of the standards. At least two opportunities are offered to show mastery on standards assessed prior to finals week. A service project will be another assessment based on both science standards and tolerance standards adopted by the district. Ex. If there are 15 standards in a semester, students with at least 13 assessments of mastery will earn an A. There are no percents, no extra credit and no points for homework, classwork nor participation. The grade reflects understanding of the standards.
Content sources	Textbook is used mainly as a reference material, introducing or reviewing topics. Current articles and scientific videos will be assigned.	Textbook is used mainly as a reference material, introducing or reviewing topics. Current articles and scientific videos.

**In the past student did the below assignment to get a better idea of the assessment type used in physics. Currently, this is simply informational for families to use to inform their decision making.**

**Students** can complete the [sample assessment](#) to familiarize yourself with what an assessment will look like in the Honors Physics course. Since the purpose of this letter and assessment is to inform students and parents about the Physics of the Universe courses, the assessment will not be graded but used as a means for families to reflect, discuss and understand the expectations of these courses.

1. **Watch the video** [We are Star Stuff](#) for you to be prepared to take the assessment. You can access the link here or by going to Mrs. Chamberlain's webpage on the PHS website.
2. Complete the [pre-assessment](#) on your own and then grade your own assessment using the [KEY for Pre-Assessment](#).

Make an informed decision based on your overall course load and what you truly enjoy!  
Mrs. C