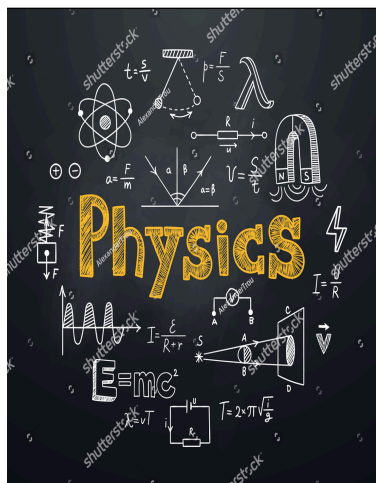


The Dalles High School Course Syllabus



Course Name: Patterns Physics B

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Office Hours: M, Tu, Th, F 3:05-3:30 PM

Course Description

This course focuses on three-dimensional learning through intertwining the disciplinary core ideas of Physics with the science practices and crosscutting concepts as described in the Next Generation Science Standards (NGSS). Students experience the patterns approach of using inquiry experiments as a mode to learn content and then apply what they have learned in engineering design tasks. The **mathematical patterns** of **horizontal, proportional, quadratic, and inverse** will be reinforced. Students will also learn how to structure their inquiry investigations with multiple designs to foster scientific discourse during the analysis of their data.

Honors Designation

Beginning with the first unit, students who desire a more rigorous course or have an interest in pursuing a career in Science, Technology, or Engineering will have the option to work towards an Honors designation. Students will need to be self-motivated to complete the curriculum, as it has numerous Engineering and Design projects that are designed to enhance the STEM Physics curriculum.

Course Content and Standards

1	<p>Patterns and Inquiry</p> <p>Students learn about data collection, graphing skills (both by hand and computer aided [Desmos]), and the fundamental mathematical patterns of the course: horizontal line, proportional, linear, quadratic, and inverse. Students perform several experiments, each targeting a different pattern and build the mathematical models of physical phenomena. During each experiment, students start with an uninformed hypothesis, then through inquiry and making sense through group consensus, can make an accurate data informed prediction.</p>
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2	<p>Texting & Driving (with Computational Thinking)</p> <p>Students are confronted with a scenario of a student who is texting and driving in the school parking lot and they are tasked to determine the effect of various parameters to see if a student will collide with a pedestrian. Students must begin by breaking the scenario down into more manageable parts to determine what must be studied about the situation. Through a series of labs and activities, students learn how to model and predict situations with constant velocity and acceleration. Then, coding a spreadsheet, students model the complex situation of a texting driver, reacting, and braking during a potentially hazardous situation to create an evidence-based argument.</p>
3	<p>Energy and Engineering</p> <p>In order to contextualize the Energy unit, students are tasked to engineer a bungee cord that will optimize the enjoyment of a doll's bungee jump. To do this, students first develop the mathematical patterns through inquiry on gravitational energy, kinetic energy, and elastic energy. Once the patterns have been established, students further build on their spreadsheet coding skills, in order to use computational thinking to create a program that will help predict the length of bungee cord necessary for a variety of situations.</p>
4	<p>Impulse, Forces and Momentum</p> <p>This unit starts with an introduction to Newton's Laws and our mid unit project is using CO₂ powered cars to demonstrate the laws of motion. The second half of this unit includes impulse and momentum. Students will use vernier technology to analyze engineering techniques such as plastic on cars and rubber on shoes. They will put this knowledge to the test with an end of unit project.</p>
5	<p>Waves and technology</p> <p>The phenomenon that launches this unit is a cell phone call to a student in the class, where the caller on speaker phone asks "How are you hearing me?". Over the course of the unit, students discover the patterns with waves. Then use that understanding to explain ultrasound medical imaging technology and ultimately how cell phones work. Cell phone communication is operationalized by the engineering challenge of communicating a three letter signal by first coding a spreadsheet to digitize the signal in binary (ASCII), then transmit the digital signal using light and sound (AM and FM), then receive and decode the signal to complete the communication. This project models the sending and receiving of a text message.</p>
6	<p>Electricity, Power Production and Climate Science</p> <p>The real world task of being a member of Oregon's Energy Commission that must create a 50-Year Energy Plan propels students through a learning arc that includes electricity, magnetism, power production, and climate science. The need to understand the basic physics of how generators work, leads us to build and explore motors. The</p>

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need for large amounts of energy and efficient generators motivates us to engineer wind turbines and optimize solar cells for local facilities use. Creating the rubric to evaluate large scale power production launches us into climate science.

Adopted Curriculum, Digital or Printed Textbooks and Readings

Adopted Curriculum is Pattern Physics and more information about this curriculum can be found at this website

<https://sites.google.com/beaverton.k12.or.us/patterns/home>

Technology Requirements

Course Web Resource:

Google classroom- ask for code if you need it!

Grading

A variety of factors and a number of assessment strategies are used to determine the level of student achievement. Grades will be based on student performance on tests, quizzes, notebook checks, homework, classwork, group projects, labs and various activities. Assignments will be given point values and grades will be calculated based on the weighted categories below:

- 60% of the final grade will be based on tests and lab scores(30 each)
- 40% of the final grade will be based on notebook checks, classwork, quizzes, and homework.

Grading Scale:

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F = 59% below

Once assignments are graded, scores will be entered into Powerschool. Students are encouraged to check their online grades on a regular basis to keep up to date.

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Classroom Expectations

Students are **prepared**. Their electronics are away and they have a sharpened pencil and their notebook at the beginning of every class.

Students are **engaged**. They are actively listening or actively participating in the physics task at hand and asking questions when they need help.

Students are **respectful**. They are taking good care of school property, getting along with peers, and following all classroom expectations.

Plagiarism/Cheating:

Plagiarism or cheating will not be tolerated. Plagiarism or cheating in any form will result in a zero on the assignment with notification of the parents and administration. Each and every student is responsible for his or her own work.

Cell Phones and Electronic Devices:

Students are **NOT** permitted to have cell phones or other electronic devices including headphone/earbuds out during class unless a teacher has authorized the use. If a student has a phone or earbuds out (in their lap, on the table, in use) they will be given a cell phone slip. They must take their phone and surrender it to the office and they may pick it up at the end of the school day. If there is a second offense, the student's parent or guardian must pick up the phone for the student.

Submitting Classwork and Assessments

Labs

Each student is required to sign a lab safety contract before participating in lab activities. Personal protection equipment is required during all labs (provided by the school). If a student is absent from a lab, it is the student's responsibility to complete the lab by acquiring data from colleagues or the teacher.

Test & Quiz Corrections

It is the expectation of the science department staff that we are preparing students to be college and career ready, this means that students are ready the first time they take a test. Students are not able to retake tests in science. However I will drop your lowest test grade and you are able to re-do or re-submit homework and labs in order to get back lost points.

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Late Classwork and Assessments

All students are responsible for getting make-up work from the days they are absent including updating their notebook with warm ups, exit tickets and notes. If you are absent for 1 day, you have one day to make up missed work for full credit. If you are absent for 2 days, you have 2 days to make up the missed work for full credit and so on. Students must get their missed assignments/work the DAY THEY RETURN. It is the STUDENTS' responsibility to get and turn in make-up work. Labs, classwork and homework turned in late will only be worth 80% of the original grade. Once the unit is complete there will be no late work accepted from that unit as well as no correction to any homework or labs at this point.

Extra Support

Support and help are available during scheduled Teacher Accessibility Time (TAT) throughout the trimester. Please use email to reach me anytime during the day. I will do my best to respond as soon as possible. My room is 301.

Communicating with Parents

In addition to the school-wide systems of Powerschool, PR's and Report Cards, I will reach out to parents/guardians through email in most cases and phone calls if necessary along with an in-person meeting if needed or requested.

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I will know you (student and parent/guardian) have read and understood the requirements for Intro to Physics A/B when you complete the attached form on the backside of this page.

Fill out and return this page.

I have read and understand the requirements for Intro to Physics A/B.

Student Name _____ Period _____

Student Signature _____

Parent Name _____

Parent/Guardian Signature _____ Date ___/___/___

Phone Number (____) _____ - _____

Parent's Email Address _____

Will your student be participating in the Honors Designation (see paragraph on page 1)?

yes no

Please write a little bit about your student, in order to help me get to know him/her, including anything you know about how they learn (learning style). I encourage you to contact me at any time if you have questions.
