

**Course Syllabus 2020-2021**  
Casa Grande Union High School  
2730 North Trezell Rd, Casa Grande, AZ 85122



**Course Name:** AP Physics 2

**Teacher Name:** Marissa C. Yap

**Teacher Contact Information:** **E-mail Address:** mcordova-yap@cguhhsd.org  
**School Phone Number:** 520-836-8500, Extension 3926  
**Personal Contact number:** (520) 276-6512

**References:** Pasco Essential Physics (3rd Edition) Interactive e-book <http://student.pasco.com/>  
Walker, James S. Physics, AP® Edition. (3rd Edition). Upper Saddle River, New Jersey; Prentice Hall, 2007. Edgenuity online course.  
<https://www.ck12.org/c/physics/#/>

**Course Materials:** laptop, Physics notebook (Microsoft Teams digital notebook and composition notebooks), calculator, pencil and eraser

**Course Objectives:** Each learning objective described in the concept outline combines content with the science practices, which describe the inquiry and reasoning skills needed to develop testable explanations. There are seven science practices, which are integrated into the curriculum of AP Physics 2.

Science Practice 1: The student can use representations and models to communicate scientific phenomena and solve scientific problems.

Science Practice 2: The student can use mathematics appropriately.

Science Practice 3: The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.

Science Practice 4: The student can plan and implement data collection strategies in relation to a particular scientific question.

Science Practice 5: The student can perform data analysis and evaluation of evidence.

Science Practice 6: The student can work with scientific explanations and theories.

Science Practice 7: The student is able to connect and relate knowledge across various scales, concepts, and representations in and across domains.

### **Unit 1. Fluids**

You'll learn about the characteristics of fluids and how a fluid's internal structure and interactions define these characteristics.

1.1 Fluid Systems

1.2 Density

1.3 Fluids: Pressure and Forces

1.4 Fluids and Free-Body Diagrams

1.5 Buoyancy

1.6 Conservation of Energy in Fluid Flow

1.7 Conservation of Mass Flow Rate I Fluids

### **Unit 2. Thermodynamics**

You'll study heat, temperature, and thermal energy in contexts such as heat engines, heat pumps, and refrigerators.

2.1 Thermodynamic Systems

2.2 Pressure, Thermal Equilibrium, and the Ideal Gas Law

- 2.3 Thermodynamics and Forces
- 2.4 Thermodynamics and Free-Body Diagrams
- 2.5 Thermodynamics and Contact Forces
- 2.6 Heat and Energy Transfer
- 2.7 Internal Energy and Energy Transfer
- 2.8 Thermodynamics and Elastic Collisions: Conservation of Momentum
- 2.9 Thermodynamics and Inelastic Collisions: Conservation of Momentum
- 2.10 Thermal Conductivity
- 2.11 Probability, Thermal Equilibrium, and Entropy

### **Unit 3. Electric Forces, Field, and Potential**

You'll begin your study of electromagnetism by getting familiar with fundamental concepts such as electric charge and electric forces.

- 3.1 Electric Systems
- 3.2 Electric Charge
- 3.3 Conservation of Electric Charge
- 3.4 Charge Distribution-Friction, Conduction, and Induction
- 3.5 Electric Permittivity
- 3.6 Introduction to Electric Forces
- 3.7 Electric Forces and Free-Body Diagrams
- 3.8 Describing Electric Force
- 3.9 Gravitational and Electromagnetic Forces
- 3.10 Vector and Scalar Fields
- 3.11 Electric Charges and Fields
- 3.12 Isolines and Electric Fields
- 3.13 Conservation of Electric Energy

### **Unit 4. Electric Circuits**

You'll continue to examine the behavior of charged particles to learn about the components of a circuit, the path that an electric current travels on.

- 4.1 Definition and Conservation of Electric Charge
- 4.2 Resistivity and Resistance
- 4.3 Resistance and Capacitance
- 4.4 Kirchhoff's Loop Rule
- 4.5 Kirchhoff's Junction Rule and the Conservation of Electric Charge

### **Unit 5. Magnetism and Electromagnetic Induction**

You'll build on your knowledge of electrostatic forces and fields to explore the relationships between moving electric charges—electric currents—and the magnetic forces and fields they generate

- 5.1 Magnetic Systems
- 5.2 Magnetic Permeability and Magnetic Dipole Moment
- 5.3 Vector and Scalar Fields
- 5.4 Monopole and Dipole Fields
- 5.5 Magnetic Fields and Forces
- 5.6 Magnetic Forces
- 5.7 Forces Review
- 5.8 Magnetic Flux

### **Unit 6. Geometric and Physical optics**

You'll be introduced to the different ways of thinking about and modeling electromagnetic waves, or light.

- 6.1 Waves
- 6.2 Electromagnetic Waves
- 6.3 Periodic Waves
- 6.4 Refraction, Reflection, and Absorption
- 6.5 Images from Lenses and Mirrors
- 6.6 Interference and Diffraction

## Unit 7. Quantum, Atomic, and Nuclear Physics

You'll be introduced to the concepts of modern physics and learn how these new models can resolve the conflicts and questions that Newtonian physics could not answer

7.1 Systems and Fundamental Forces

7.2 Radioactive Decay

7.3 Energy in Modern Physics (Energy in Radioactive Decay and  $E = mc^2$ )

7.4 Mass-Energy Equivalence

7.5 Properties of Waves and Particles

7.6 Photoelectric Effect

7.7 Wave Functions and Probability

**Course Description:** AP Physics 2 is equivalent to most college-level introductory physics courses with a focus on the following topics: fluid statics and dynamics, thermodynamics, PV diagrams and probability, electrostatics, electrical circuits with capacitors, magnetic fields, electromagnetism, physical and geometric optics, and other topics in modern physics. AP Physics 1 should be taken before this course, which covers traditional mechanics and other important introductory topics. Emphasis will be placed on understanding physical science literacy and applying physics concepts to think critically and solve problems. Algebra and trigonometry are the primary mathematical tools for problem solving. Science literacy is the process of both knowing physics and doing physics. Hands-on laboratory and the scientific notebook will be emphasized. This course will prepare the student for the AP exam in May. This class is scheduled for 60 minutes every day from August until the end of May. (Adopted from AP® Physics 2 Sample Syllabus 4 Syllabus 1066438v1)

### Grading System:

Activity	% of	Description
Homework	15	Each homework assignment will be graded for correctness, completeness, and timeliness.  <b>* All work must be shown. If you do not know how to solve a problem, you have to demonstrate that you tried to solve it.</b>
Classwork	15	Bell work, other classroom activities (excluding labs), and organizational skills (LAB SHEETS and NOTEBOOKS) will be assessed. Effort and correctness will be the primary concerns for these items.
Labs	25	Laboratories will comprise a significant portion of the students learning experience (~25 %). <i>You will be assigned a lab group and will work in that group during labs. Everyone in your group is responsible for the equipment, which means if something is missing or broken, I will hold each of you accountable. Lab groups will change at the start of a new grading period or as otherwise determined.</i>  Virtual lab activities will be done mainly using Gizmos, Phet simulations and other digital tools if group experiments are not permitted during this pandemic.
Quizzes	15	Quizzes will be comprised of free response questions that closely resemble questions available to students in the online quiz bank. Students will be provided with a formula sheet (including appropriate constants) during the quizzes.
Exams/Unit Tests	30	Exams will be comprised of free response and multiple-choice questions, which closely resemble quiz bank online questions and the new College Board AP Physics 1 test design. Students will be provided with a formula sheet (including appropriate constants) during the exams.

A = 90-100

B = 80-89

C = 70-79

D = 60-69

F = 59 & Below

## Late Work Policy:

- A. **Late work will be accepted for an excused absence without any deductions.** Homework is **always** due the following day unless announced differently. Therefore, if it has not been announced when the assignment is due, assume it is the next school day. If you have an absence, do your make up after you return. Deductions will incur after a week (5 points per week). It is the student's responsibility to get the assignments that he or she missed.
- B. **IMPORTANT:** If work is already returned to class and you missed it, you will have to ask for a new set of questions after class hours.
- C. **Tutorials.** You may make an appointment, or you can join Office Hours, and I will do the best I can to be available to you; just make sure you notify me of your intentions. PLEASE JOIN THE TUTORIALS IF YOU FEEL UNSURE ABOUT ANYTHING. **Do Not Procrastinate!**

## MS Teams Virtual Office Hours for Tutorials and Consultations

Thursdays (3:00-4:00 p.m.)

- D. **Tests.** Major tests will be announced **at least** 2 days in advance. If you are present any day before the test when the test dates are announced, you **will** be expected to take the test with the rest of the class (i.e., absent 1 day before the test, but present on the day of the test, you still have to take the test).
- E. **Make-Up Tests.** Students are responsible for making-up all missed work and arranging for missed quizzes and/or tests. You can come after school to do missed work.
- F. **Test Corrections.** If you get a very low score or if you fail a test, you are given a chance to improve your score by doing Test Corrections. The procedure and guidelines of doing Test Corrections are given below.

### Test Corrections

Adapted by Marissa Yap from Mr. Fuerderer

Test corrections can be a powerful learning tool if they are handled effectively. When students correct their tests with specific guidelines that force them to analyze and understand their errors, they will relearn the material in a way that helps them to retain the information or master the skills better.

1. **Corrections must be done on a separate piece of paper** stapled to the front of the original test.
2. **Corrections must be signed by a parent.** Test corrections may be reviewed with parents during parent-teacher conferences.
3. Corrections must be turned in within the next **3 school days** or they will not count. It is the student's responsibility to develop time-management skill, so the deadline is firm.
4. Students must explain their mistake in words and show all the work necessary to do the problem correctly. It is NOT sufficient to just list the correct answer. **Students must explain why they made a mistake and explain the reason for their misunderstanding.**
5. If the error is a result of not understanding the vocabulary, the student should include the correct **definition of the term(s) misunderstood.**
6. Students must be prepared to show ALL of the homework that they should have done in preparation for the original test. Ideally, students will have all of the homework completed before the original test. If a student has not completed the homework ahead of time, they will still have to do the homework afterwards as a requirement of the test corrections. Bottomline, do your homework and be prepared to show your homework. **If the homework is not done, then the test corrections will not be accepted.**
7. Each **properly done correction is worth half the points of the original problem.** Students will notice that their

grade can improve significantly when they properly complete the Test Corrections.

8. Students who choose not to do test corrections will be exempt from the task, but they will not benefit from this opportunity to learn and to raise their grade. This too will likely be discussed during parent-teacher night and will certainly count in determining the student's Work Habits (Good, Satisfactory, Not Satisfactory).
9. The teacher reserves the right to change or modify these instructions at any time.

## **Classroom Management Plan (Online Class):**

### **TEAMS Meeting Norms:**

1. All Participants should be in "MUTE" mode unless speaking.
2. Click the Raise Your Hand sign at the bottom of your video if you want to ask questions or share an idea about a topic on hand.
3. You may also use the chat feature to type your questions as discussions are ongoing.
4. You are expected to refrain from sending messages to your classmates during our class discussions.
5. Turn off all notification and place phones on silent.

### **Microsoft TEAMS Meeting Etiquette:**

1. Check your surroundings.
  - a. Lighting
  - b. What is behind you?
2. Double check your clothing.
3. Follow ground rules, just like a live discussion in our classroom.

## **Tips for Student Success in an Online Environment:**

Develop a consistent, quiet, and clean space to work

Abide by the same expectations that would be in place if you were in a physical classroom

School appropriate attire is required to participate in video classwork

Discipline matters will be fairly and consistently enforced

Contact your teacher with any questions that may arise

Be patient and flexible with your fellow students and your teachers, as this is a challenging time for all.

## **Classroom Management Plan (In-Person):**

The expectations, rules, procedures, and consequences are intended to keep the classroom environment safe, orderly, and productive. You are expected to respect the rules to maximize learning time together. The rules are not hard to follow, nor are any of them "out of the ordinary." Thank you for your cooperation.

## **COVID Handbook Addendum:**

### **COVID-19**

- Maintain 6' spacing (as much as possible)
- No intentional coughing on or near anyone
- Face masks must be worn at all times
- Face masks must be disposable or cloth (at least two layers if possible)
- No bandanas
- No mesh masks
- Mask must be deemed appropriate by administration and staff and conform to all regulations
- No spraying of cleaning products on another student or wasting cleaning spray
- Medical documentation must be provided for any reason that a mask cannot be worn

- Please see the Center for Disease Control’s website for further guidance for mask recommendations: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-to-wear-cloth-face-coverings.html>
- **Any violation of these and or a combination will result in an immediate removal from the class and parents/guardian will be called immediately to pick the student up. Students will be subject to all disciplinary actions if these rules are violated from conference to suspension.**

### **Class Procedures**

1. Go to the rest room before entering the classroom.
2. Next rest room time will be 10 minutes before the dismissal.
3. Only one student at a time will be allowed to go to the rest room. Log in and out and bring hall pass if you need to go out of the classroom. You are given a maximum of 5 minutes.
4. Put your desk back in line before you leave each day.
5. Get missed work from the teacher before or after school. Your attendance is essential for optimal learning. Being on time and present in class physically and mentally have a direct positive effect in your grade.
6. If you are absent, it is your responsibility to obtain any missed classwork. Refer to the activities posted in blackboard/MS Teams. Follow-up with the teacher if needed after school.
7. Make arrangements to take quizzes and tests immediately after school. It is your responsibility to make these arrangements. If you do not make-up quizzes in a timely manner (before graded quizzes are returned to the students who were present), you will earn a “zero” on the quiz or test.

### **Class Rules**

1. Cellphones must be turned off and must not be seen in this class and so you are expected to place them in your bags. Other electronic devices (CD players, handheld games, mini-TVs or personal DVD players, pagers, etc.) are NOT permitted in the classroom.
2. No food or drink, except water.
3. Arrive to class on time & ready to learn. When the bell rings, you need to be sitting in your assigned seat. You should immediately begin on the bell work.
4. Never line up at the door before dismissal. Remember, Ms. Yap dismisses you, not the bell.
5. Use polite and appropriate language. Offensive, derogatory, and profane terms are not tolerated. To have a safe classroom environment where all students feel comfortable no put downs, swear words, or slang words with demeaning connotations will be accepted.
6. Raise your hand to speak or leave your desk.

### **CLASSROOM DISCIPLINE**

If you fail to meet any of the above rules, then the following consequences will occur:

1. Verbal warning: I start off by telling you that you are doing something wrong and that you need to stop.
2. Parent Call/Parent-Teacher conference
3. Office Referral: If you continue to break rules then you will receive an office referral.

**Movie/Film Policy:** Parental request forms will be distributed for each movie shown. Also, your teacher will ask for administrative approval before a movie will be shown to the class. If incase a movie relevant to a chemistry topic is shown and the students’ parents decline the student permission to view the movie, an alternative assignment will be given such as a research work on the same topic.

**General Lab Rules (If performing group experiments are allowed during this time of pandemic)**

1. Conduct yourself in a responsible manner.
2. Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ask the instructor before proceeding.
3. No student may work in the lab without an instructor present.
4. When first entering a science room, do not touch any equipment in the lab area until told to do so. Perform only experiments authorized by the instructor. Unauthorized experiments are prohibited.
5. No food, drink or chewing gum is allowed in the lab.
6. Keep aisles clear. Move bags out of aisles.
7. Wash your hands with soap and water after performing all experiments. Clean all work surfaces at the end of the experiment. Return all equipment clean and in working order as directed.
8. Work in the assigned lab area. Do not wander the room, distract other students, or interfere with other groups' experiments.
9. When removing an electrical plug from its socket, grasp the plug, not the electrical cord.
10. When using sharp instruments, carry the tips and points pointing down and away. Never try to catch falling sharp instruments. Grasp sharp instruments only by the handles.
11. Dress properly during a lab activity. Shoes must completely cover the foot. Heavy Masses are used in some labs and do fall from time to time! Keep a pair in your locker, just in case.

Approved:

**Stacy Brady**  
Science Dept. Head

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Please sign below indicating that you have read and understood the expectations, content, and policies for AP Physics 2 (Teacher: Mrs. Marissa Yap).

_____	_____	_____
Name of student	Student's Signature	Date

_____	_____	_____
Name of parent/guardian	Parent's Signature	Date