

IB Physics 3-4 Syllabus
Metro Classical and Academic High School
2020-2021

Instructor:

Course Website: <https://www.slps.org/Page/41184>

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Required Materials: 1) IB Physics, 6th Edition Textbook 2) Notebook (Spiral or 3 ring binder with paper) 3) Folder
 4) Writing utensil 5) Calculator (Graphing are preferred.)

IB Physics Course Overview

Physics 1-2 (Year 1)	Physics 3-4 (Year 2)
Unit 1 1D Motion and Error Analysis (IB 1.1, 1.2, 2.1)(course-wide)	Unit 8 Circular Motion and Gravity (IB 6.1, 6.2)
Unit 2 2D Motion and Vectors (IB 1.3, 2.1)	Unit 9 Oscillations and Rotation (IB 4.1, 9.1, B.1)
Unit 3 Forces and Newton's Laws (IB 2.2)	Unit 10 Waves (IB 4.2, 4.3, 4.4, 4.5)
Unit 4 Work and Energy (IB 2.3)	Unit 11 Electricity (IB 5.1, 5.2)
Unit 5 Momentum and Collisions (IB 2.4)	Unit 12 Electromagnetism (IB 5.3, 5.4)
Unit 6 Thermal Physics (IB 3.1, 3.2)	Unit 13 Nuclear Physics (IB 7.1, 7.2)
Unit 7 Thermodynamics and Energy (IB B.2, 8.1, 8.2)	Unit 14 Particle Physics (IB 7.3, 12.1)
	An Independent Internal Assessment (IA) Project

IB Assessment Info: Paper 1 (20%) , Paper 2 (40%), Paper 3 (20%), IA (20%)

Course goals:

1. Review first year IB topics (for IB exam Papers 1 and 2)
2. Complete the second year IB topics (for IB exam Papers 1 and 2)
3. Complete the 8 required laboratory practicals (for IB exam Paper 3)
4. Complete an independent internal assessment project

Grading: Grades will be determined by the following formula:

$$\text{Percent grade} = \frac{\text{Earned points} + \text{Extra Credit}}{\text{Possible points} - \text{Exemptions}} \times 100$$

There are many different factors that contribute to your physics grade so that there are no large High Stakes assignments, including the final.

IB Physics Class Semester Components	Typical percent contribution for a semester grade
IB Mastery Quizzes (10 pts ea)	10%
Unit Tests (80 - 100 pts ea)	35%
Lab Reports (25 pts ea)	20%
Homework (2 pts ea)	5%
Formative Assessments (1-2 pts ea) (exemptions)	5%
IA Project components (20-50 pts ea)	10%
Comprehensive Final Exam (150 pts)	15%

"Success is the maximum utilization of the ability that you have."— Zig Ziglar

Letter Grades A (89.5 to 100) B (79.5 to 89.4) C (69.5 to 79.4) F (<69.4)

Because there will be extra credit opportunities throughout the semester, final grade percentages will not be modified. Extra Credit contributions to your physics grade shall not exceed 5%. Any extra credit opportunity that may arise will be available to all students.

IB Mastery Quizzes: We will review first year topics as they arise and are related to new content. You will get your first try at a 10 pt mastery quiz for the IB objectives associated with that review topic at that time. **You must attempt every mastery quiz at least once or a score of zero will be entered at the end of the semester.** Mastery quizzes are typically two 4 pt application problems and two 1 point multiple choice conceptual questions. If you get less than 8/10 on a mastery quiz, you are required to take another version of that quiz. Your new score will replace your old score if and only if it increases your score. First attempts at each mastery quiz will occur in class, but requizzing must be done before school, at lunch or after school. You must give me a minimum of 24 hours notice before you want to take a requiz to allow me time to write or print a new one for you. Any topics not reviewed within the context of the second year will be reviewed at the end of the second semester to help prepare for the IB exam.

Tests: Unit Tests which occur upon completion of the corresponding new unit are typically 100 pt tests. If you miss a test day, you will need to take an alternate version of the test as soon as you can. If you earn **<60 % on a test**, you are **required to retest.** Your two scores will be averaged for your unit test grade. If you earn between 60 and 80%, you *may* retest. Retests must be completed after school, before school or during lunch. You will be provided with a clean IB Physics Data Booklet for use during all tests.

Lab Reports: Laboratory reports will use the “Physics Laboratory Format” document that will be provided separately, unless otherwise noted. Lab Reports are graded on a 25 point scale and are due one week after the experiment has been done unless otherwise noted. Points may be deducted for late reports at a rate of 5 points each class it is late.

Homework: There will be homework nearly every class. Often you will be able to begin the homework assignment during class time when I am available to help as needed. Homework assignments are due at the beginning of our next class. It's a good idea to build a habit of working together on physics problems. Homework is graded on effort, completion, and correctness. Homework is worth 3 pts (1 pt for completeness, 1 pt for on time submission, and 1 pt for correctness). 0 is recorded if the assignment is simply not done. Students should correct their work as needed during the homework discussion and ask questions if anything remains unclear.

Fair warning: Not doing the homework assignments with your best effort is the quickest way to sabotage your grade.

Participation and Formative Assessment:

- A. P3 Challenge: Most classes will begin with a 3 to 5 minute P3 challenge which may be a review question, a sampling from the homework, or a question relating to the lesson for the day. P3 stands for Present, Prepared and Proficient. You earn one point for being present and prepared with a writing utensil, and you earn a second point if you answer the question correctly.
- B. Exit Slips: Most classes will end with an exit slip which may be a problem like a P3 challenge, a demonstration of progress on the homework for the day, or a verbal question. Exit slips will be worth one point.
- C. Other: While your participation in all classroom activities is expected, there may at times be additional short assessments such as an unannounced quiz, not to exceed 3 pts.

Internal Assessment: What topic have you been thinking about?

Approximate pacing (On a separate document.)

Required IB Laboratory Practicals: There are 8 laboratory experiences that IB expects physics students to have. They are listed below. You met the first 2 requirements during year one with the measurement of the acceleration of gravity using an inclined plane and the measurement of heat capacity. The third topic will serve as practice topics for designing an independent project such as your IA. You will work in teams of 2-3 to design, execute and report on a experiment for this objective in a way that is related to the IA project to give you practice before doing a project on your own. Your team will work together to create a single good document for your experiment that may require revisions. This is the **only** time lab partners work on the same document. The remaining seven experiments correspond to second year topics and will be done as regular classroom laboratory experiments or simulations. You work together to collect the data, have the same data set to use, but write your own report. Here are the 8 IB Required practicals.

- 2.1 Determining the acceleration of gravitational free-fall experimentally
- 3.1 Applying the calorimetric techniques of specific heat or specific latent heat experimentally
- 3.2 Investigating at least one gas law experimentally (mock IA group project)
- 4.2 Investigating the speed of sound experimentally
- 4.4 Determining refractive index experimentally
- 5.2 Investigating one or more of the factors that affect resistance experimentally
- 5.3 Determining internal resistance experimentally
- 7.1 Investigating half-life experimentally (or by simulation)

Final: The final for each semester will be comprehensive with no exemptions. The final for the first semester will be a practice IB exam including all content up to that point. The final for the second semester is the IB exam itself and will not have a point value assigned to the course grade.

Absences and Tardies: When you have an excused absence, you are exempted from the P3 Challenge, Exit Slip and anything else beyond your control for that day. Regardless of the reason for the absence, you are still responsible for completing the homework, classwork, laboratory experiments or tests in a timely fashion. You are also expected to obtain a copy of the notes from a classmate. Check the class website. All course materials for the day will be posted there. All makeup or late work needs to be completed by the end of the corresponding unit. The grade for any work still missing may become a zero score on the unit test day. If you are tardy, you are responsible for all missed work. There are no exemptions for tardiness. More than 4 tardies in a semester will result in a referral to administration.

Elective Peer Tutoring: You may elect to sign in for tutoring time during lunch or after school. Anytime more than one student is working together, helping each other out with physics, 1 pt extra credit will be awarded to both students because most of the time, the distinction between a tutor and a tutee is very blurred. I will be available to help or reteach as needed. Forming study groups is a powerful way to study science. You may also work on improving your mastery of year 1 content using the mastery quizzes. (Extra Credit earned may not exceed 5% of your final grade.)

Required Tutoring: If your class average falls below 70%, it is required that you participate in tutoring to correct your mistakes and clarify misunderstandings until your grades improve.

Classroom Norms:

- 1) Turn off Cell Phones (like in a Movie Theatre) – Collected during tests
- 2) Participate Fully, Stay in the Work
- 3) Off topic conversations will be shelved for later
- 4) Respect everyone's learning process and progress, including your own – Everybody makes mistakes.
- 5) Do your best
- 6) Adhere to all rules and regulations outlined in the Student Handbook.

Classroom Procedures:

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| 1) Arrive on time | Visit bathroom, or get water, before or after class. |
| 2) P3 challenge; homework check | Blow your nose discretely. |
| 3) Homework review | Wait to be dismissed. |
| 4) Lesson activities—Varies | Stay seated unless otherwise directed. |
| 5) Record the Homework assignment | Label all work with your name, date, "Physics 3" |
| 6) Complete the Exit Slip. | E.g. " Jared S. 9/13 Phys 3" |