Welcome to IB Physics SL/Physics

Syllabus for 1st Semester

Your teacher will be me, Mr. Dale Brabec. This will be an interesting/exciting/thought provoking class, if you understand the following.

Expectations
1. Respect everybody 2. Be prepared for class 3. Be a good listener. 4. Stay on task. 5. Do a little physics everyday

In this class you will be required to follow **all West High School rules** including the tardy policy.

You might be wondering what will be included in this Physics/IB Physics class.

This course is has two different class names however we will be following the IB curriculum which is stated below. Those student who have signed up for regular physics don't think that this course will be harder because we will be following the IB curriculum. It will be the same information as any other regular physics course in the district.

This course provides a systematic introduction to the main principles of physics and emphasizes the development of conceptual understanding and problem-solving ability using algebra and trigonometry. This course is based on the IB Physics SL course so there will be an internal assessment and an external assessment component. The external assessment in May will not be included in your grade but you will have to take it or you will have to take a final examination that I create.

The course includes topics in both classical and modern physics. A knowledge of algebra and basic trigonometry is required for the course; the basic ideas of calculus may be introduced in the theoretical development of some physical concepts, such as acceleration and work. Understanding of the basic principles involved and the ability to apply these principles in the solution of problems should be the major goals of the course.

Syllabus Outline

		Teaching hours
Core		**80**
Topic 1: Physics and physical measurement		**5**
1.1	The realm of physics	1
1.2	Measurement and uncertainties	2
1.3	Vectors and scalars	2
Topic 2: Mechanics		**17**
2.1	Kinematics	6
2.2	Forces and dynamics	6
2.3	Work, energy and power	3
2.4	Uniform circular motion	2
Topic 3: Thermal physics		**7**
3.1	Thermal concepts	2
3.2	Thermal properties of matter	5
Topic 4: Oscillations and waves		**10**
4.1	Kinematics of simple harmonic motion (SHM)	2
4.2	Energy changes during simple harmonic motion (SHM)	1
4.3	Forced oscillations and resonance	3
4.4	Wave characteristics	2
4.5	Wave properties	2
Topic 5: Electric currents		**7**
5.1	Electric potential difference, current and resistance	4
5.2	Electric circuits	3
Topic 6: Fields and forces		**7**
6.1	Gravitational force and field	2
6.2	Electric force and field	3
6.3	Magnetic force and field	2
Topic 7: Atomic and nuclear physics		**9**
7.1	The atom	2
7.2	Radioactive decay	3
7.3	Nuclear reactions, fission and fusion	4
Topic 8: Energy, power and climate change		**18**
8.1	Energy degradation and power generation	2
8.2	World energy sources	2
8.3	Fossil fuel power production	1
8.4	Non-fossil fuel power production	7
8.5	Greenhouse effect	3
8.6	Global warming 3	

		Teaching hours
Options SL		**15**
Option A: Sight and wave phenomena		**15**
A1	The eye and sight	3
A2	Standing (stationary) waves	2
A3	Doppler effect	2
A4	Diffraction	1
A5	Resolution	4
A6	Polarization	3
Option B: Quantum physics and nuclear physics		**15**
B1	Quantum physics	10
B2	Nuclear physics	5
Option C: Digital technology		**15**
C1	Analogue and digital signals	4
C2	Data capture; digital imaging using charge-coupled devices (CCDs)	4
C3	Electronics	5
C4	The mobile phone system	2
Option D: Relativity and particle physics		**15**
D1	Introduction to relativity	1
D2	Concepts and postulates of special relativity	2
D3	Relativistic kinematics	5
D4	Particles and interactions	5
D5	Quarks	2
Option E: Astrophysics		**15**
E1	Introduction to the universe	2
E2	Stellar radiation and stellar types	4
E3	Stellar distances	5
E4	Cosmology	4
Option F: Communications		**15**
F1	Radio communication	5
F2	Digital signals	4
F3	Optic fibre transmission	3
F4	Channels of communication	3
Option G: Electromagnetic waves		**15**
G1	Nature of EM waves and light sources	4
G2	Optical instruments	6
G3	Two-source interference of waves	3
G4	Diffraction grating	2

You will have to bring certain things to class everyday.

1. Your Physics textbook
2. Your physics notebook which will include
    a. Your notes
    b. Your classwork/homework
    c. Your tests/quizzes
    d. Your projects
3. Your physics lab book (make sure you keep your lab book in great shape because you will have to make copies of labs to turn in to IB for your internal assessment)
4. Pen, paper, and calculator

Attendance policy:

Daily attendance is necessary for success in this class. It is the responsibility of the student to get notes and work if a class is missed. You are expected to be on time for class. Any work or quizzes missed when tardy will receive a 0.

Late work policy:

Work will be due on the day assigned. Late work will be considered at the option of the instructor. You will be allowed 1 day per excused absence day up to a maximum of 4 days to make up work and tests.

Your grade will be based on weighted categories.

Lab/Demos(**Internal Assessment**) 25%

You will be performing hands-on labs that with help you understand physics concepts. Normally we will have labs/demos twice every week. IB mandates that ¼ of class time should be spent on hands-on application. This will make up 24% of your IB Physics grade. You will be marked using IB's grading criteria. Included in this will be a Group 4 project. This will be a thematic group project with including physics, chemistry, and biology students. Sometimes you will be working in a group and other times alone. You will have to maintain a formal lab notebook. I will be checking your lab write-up and during your weekly quizzes there will normally be a question concerning some aspect of your recent labs/demos. You will be able to use your lab notebook on the quizzes. I will tell you what needs to be included in each lab.

Homework/classwork 25%

Every night you will have homework. Normally this homework will be from your textbook. It is very important to do a little physics homework every night.

Quizzes 25%

You will have a quiz about once a week. These quizzes will be a review of the material recently covered. They will normally be short in length (2-4 questions). I might have shorter quizzes but more frequently.

Tests (**External Assessment**) 25%

You will have test about every 3 weeks. Each test will have a multiple-choice part and a free response part. This is exactly what the IB test will be like. The questions on the tests will be very similar to the IB questions of previous tests. In May you will be taking the IB Physics SL tests. There will be 3 parts to this test.

- Part 1: Multiple Choice (no calculator) 20%
- Part 2: Short Answers from core topics 26%
- Part 3: Short Answers from 2 option topics 30%

Grading Scale (this might change)

85 – 100%	A
70 – 84%	B
60 – 69%	C
50 – 60-%	D
less than 50%	F

Please take this syllabus home and have your parents read it. If you or your parents have any questions, please contact me at school.

Dale Brabec

Classroom:	22
Conference Period:	4th (in the science wing)
School phone #	742 - 2500
Email	Brabec_dale@asdk12.org
Web page	http://alaskaphysics.com

I have read and understand the course syllabus and I accept the expectations associated with this class.

_____ _____

(Student Name, printed) (Student ID)

_____ _____

(Student Signature) (Parent Signature)

_____

(Date)