

SPH3U - Grade 11 Physics (IB)

Welcome!

Mr. Childs

My website: www.mrchilds.com

(video lessons, tasks, schedule)

Edsby for communication and handing in Tasks,
Quizzes, etc.

Microsoft Teams for online learning.

Classroom Concerns (rules if you like)

1. **Safety** is the first priority, especially during investigations and hands on activities
2. Avoid food please; the tables and tools in this room come into contact with chemicals and other things that would be best not to ingest. (a sealed water bottle that can't break is acceptable during regular classroom activities - no coffee, pop, etc.)
3. I am a fan of **technology** until it becomes a distraction. I will start off open minded about all forms of technology and I will become more restrictive if you demonstrate you are unable to adhere to ***intelligent, respectful use in the classroom and online***.
4. I will post all information pertaining to this course on the class calendar that can be found ***www.mrchilds.com*** You are responsible for checking the calendar regularly to see when tests and tasks are due (Edsby as well). If you are away or ill it is your responsibility to notify me (email or Edsby) and check the calendar for missed work. I will post the class notes in a pdf format ahead of the class for your use.
5. Lastly, but not leastly, I want my classroom to be described with the following words:
interesting, fun, safe, inviting, respectful, educational, challenging, insightful, welcoming

Welcome to Grade 11 Physics

Rule #1 - ANYONE can learn physics.

Rule #2 - Physics is NOT math, but math is used as a tool to describe, compare and study.

Rule #3 - Physics is a WAY OF THINKING and seeing the natural world around you.

Class SURVEY

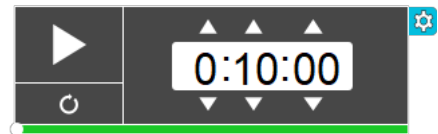
There WILL be times when you are lost, confused, or wrong; they are part of the learning process. How you deal with those situations will be what determines your long term success.

The general rule for education is if you are not uncomfortable, you are not learning.

Make groups of four (preferably with people you haven't met, or don't know that well. Introduce yourself, have a seat and await the next question.

As a group, come up with a consensus (all agree) answer to the following. Be prepared to share your answers with the rest of the class.

What is "Physics"?



For clarity, the grades 11 and 12 Ontario curriculum and the IB physics course have a great deal in common from a topics standpoint.

Fundamental Concepts Covered in This Course (see also page 5)

Fundamental Concepts	Kinematics	Forces	Energy and Society	Waves and Sound	Electricity and Magnetism
Matter		✓	✓	✓	✓
Energy	✓	✓	✓	✓	✓
Systems and Interactions	✓	✓	✓	✓	✓
Structure and Function	✓	✓		✓	✓
Sustainability and Stewardship			✓	✓	✓
Change and Continuity			✓		

Grade
11

Fundamental Concepts Covered in This Course (see also page 5)

Fundamental Concepts	Dynamics	Energy and Momentum	Gravitational, Electric, and Magnetic Fields	The Wave Nature of Light	Revolutions in Modern Physics: Quantum Mechanics and Special Relativity
Matter	✓	✓	✓	✓	✓
Energy	✓	✓	✓	✓	✓
Systems and Interactions	✓	✓	✓		
Structure and Function	✓	✓	✓	✓	
Sustainability and Stewardship		✓		✓	
Change and Continuity		✓			✓

Grade
12

II. Curriculum model overview

IB

Component

Core

1. Measurements and uncertainties
2. Mechanics
3. Thermal physics
4. Waves
5. Electricity and magnetism
6. Circular motion and gravitation
7. Atomic, nuclear and particle physics
8. Energy production

Additional higher level

9. Wave phenomena
10. Fields
11. Electromagnetic induction
12. Quantum and nuclear physics

Option (Choice of one out of four)

- A. Relativity
- B. Engineering physics
- C. Imaging
- D. Astrophysics

Science in High School

(but there is so much more out there)

Biology

The scientific study of life and of living organisms. Botany, zoology, and ecology are all branches of biology.

Chemistry

The scientific study of the structure, properties, and reactions of the chemical elements and the compounds they form.

Physics

The scientific study of matter, energy, space, and time, and of the relations between them.

Thinking about relationships instead of just finding answers.

Example:

For the equation, $a = 2b$, determine the following:

- (i) What is the value of "a" when "b" is 20?

- (ii) What is the value of "b" when "a" is -12?

- (iii) Describe the value of "a" when "b" is a large, positive number.

- (iv) Describe the value of "b" when "a" is a very small, negative number.

This is referred to as "directly proportional" - an increase in one value results in an increase in the other (same for decrease).

Thinking about relationships instead of just finding answers.

Example:

For the equation, $a = \frac{1}{b}$, determine the following:

- (i) What is the value of "a" when "b" is -2?

- (ii) What is the value of "b" when "a" is 0.1?

- (iii) Describe the value of "a" when "b" is a large, positive number.

- (iv) Describe the value of "a" when "b" is a very small in magnitude, negative number.

This is referred to as "inversely proportional" - an increase in one value results in an decrease in the other.

Thinking about relationships instead of just finding answers.

Example:

For the equation, $a = bc$, determine the following:

- (i) What is the value of "a" when "b" is 4 and "c" is 5?
- (ii) What is the value of "b" when "a" is 1000 and "c" is 100?
- (iii) Describe the value of "a" when both "b" and "c" are large, positive numbers.
- (iv) Describe the value of "a" when "b" is large, positive numbers and "c" is a large (magnitude) negative number.
- (v) Describe the magnitude of "a" when "b" is constant value and "c" is decreasing toward the value of zero.

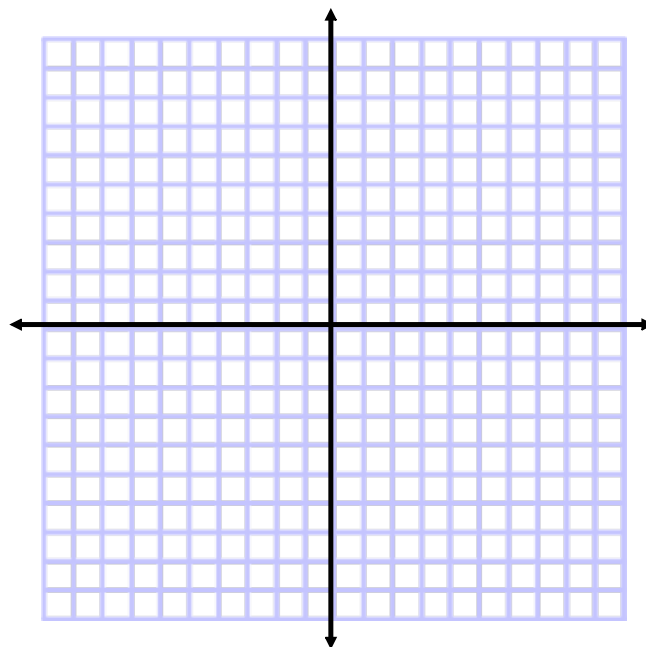
A few math concepts for review...

(1) A line passes through the points $A(4,6)$ and $B(-2,-6)$:

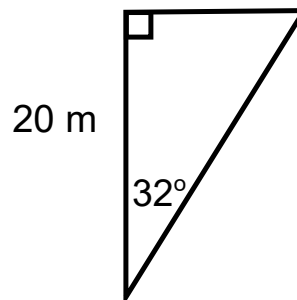
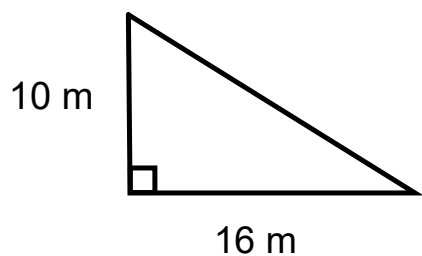
(i) what is the slope (rate of change) of the line?

(ii) what is the y-intercept of the line?

(iii) what is the equation of the line?



2. For the following Triangles, use SOHCAHTOA and Pythagorean Theorem to find all of the missing sides angles:



Task - Warm Up Part 1