

**ROBINSON SECONDARY  
SUMMER '09 ASSIGNMENT**

**IB PHYSICS 2 HL**

Welcome to IB Physics 2 HL. This is a great course with an interesting variety of topics. Based on typical student interest, one of the topics that we will cover is relativity, an abstract topic that makes for great discussions. (Look up "Twin Paradox" for an example.)

**Purpose:** The purpose of this assignment is for you to get some exposure to some relativity concepts: space-time, relative motion and frames of reference, speed of light, the first and second postulates of special relativity, time dilation, twin paradox, length contraction, relativistic momentum, mass-energy equivalence, relativistic energy.

**Directions:**

1. **Obtain a Special Relativity packet and Conceptual Physics book** (Hewitt 3<sup>rd</sup> ed.) from **Mrs. Mahoney in C105** by the end of the school year.
2. In the textbook:
  - a. Read chapter 15.
  - b. Answer any 10 of the 15 Review Questions on page 230.
  - c. Read chapter 16.
  - d. Answer any 12 of the 18 Review Questions on pages 241-242.
3. In the Special Relativity packet:
  - a. Review the concepts by reading the packet topics first.
  - b. Read over the Solved Examples to see how the new equations are applied.
  - c. Complete the 12 Practice Exercises
  - d. **SHOW ALL OF YOUR WORK** and check your answers here:
    - 1)  $2 \text{ m}\cdot\text{s}^{-1}$ ; 2)  $10 \text{ m}\cdot\text{s}^{-1}$ ; 3) 28 hours; 4a) longer; 4b)  $4.3 \times 10^{-8} \text{ sec}$ ;
    - 5) Albert 33yr & Henry 39.6 yr; 6) 0.87; 7) 13.0m; 8) 0.66c; 9) 94 450 km;
    - 10)  $4.13 \times 10^{-12} \text{ J}$ ; 11)  $1.0 \times 10^{-3} \text{ kg}$ ; 12)  $4.8 \times 10^{-10} \text{ J}$
  - e. Choose any 6 of the Additional Exercises or Challenge Exercises from the Special Relativity packet to solve and submit.

**Assessment:** On the first day of class you will submit:

- 1) The answers to the 10 questions you selected from chapter 15
- 2) The answers to the 12 questions you selected from chapter 16
- 3) The Special Relativity packet with all 12 Practice Exercises completed
- 4) The solutions to any 6 of the Additional Exercises or Challenge Exercises from the Special Relativity packet.

This grade will be ~5% of your first quarter grade.

**Due Date:** Bring all parts of the assignment on the first day of class. Late work will be 50% credit.

**Contact Person:** If you have any questions about the assignment contact Mrs. Mahoney in C105 or via e-mail at [Jill.Mahoney@fcps.edu](mailto:Jill.Mahoney@fcps.edu). As a backup you could contact Ms. Booker at [Melissa.Booker@fcps.edu](mailto:Melissa.Booker@fcps.edu).