Instructions for Unit 10 (Special Relativity)

1. Read the Introduction, Learning Objectives, and Suggested Procedure & Commentary sections (1) through (2) of the unit (short-hand SPC 1-2*).
2. Skim for understanding the supplemental attachment “The Michelson-Morley Experiment”**
3. Read the supplemental attachment “Relativity–The Special Theory.”
4. Read SPC 3-9. For Objective (3), you are only expected to master the qualitative elements of derivation of the time dilation formula that is given in SPC 5 relating \( \Delta t \) and \( \Delta T \) given in SPC 5. In SPC 6, this formula is simplified further, but you are not required to master the mathematical manipulation used in the simplification. However, you are required to be able to use the relativistic formulae found in SPC 7 and SPC 9 when they are given to you (you are not expected to memorize them). When you take the unit tests, you will be allowed to use the formulae sheet (“Formulae Useful for Unit 10 Tests”) that has been inserted after this page of instructions.
6. Web access Physics Classroom Length Contraction (full URL is http://www.physicsclassroom.com/mmedia/specrel/lc.html)
7. If you wish some nice animations about relativistic reference frames and simultaneity, click on http://webphysics.davidson.edu/physletprob/ch10_modern/referenceframes.html.
8. Go to web page http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html; click on Relativity; click on Twin Paradox; click on Pole-Barn Paradox and read for comprehension.
9. Keep for FUTURE reading the supplemental attachment “The Great Relativity Bomb Plot.” Do NOT read it now for there is no time. There is no new material presented in this that you have to master. However, it is quite entertaining, and can be a useful review of many of the relativistic concepts developed in this unit. Try to figure out why all the effects that are shown in the drawings happen.
10. Do the Study Exercises at the end of this unit.

* SPC 1-2 = Suggested Procedure and Commentary, sections (1) through (2).

** Supplemental attachments are located after the study exercises found at the end of the unit.