Agenda for the OTF Physics Camp: Aug11-13, 2010

Presented by Roberta Tevlin and Dave Doucette

Wednesday Aug. 11

9:00 - 9:30 Registration & Welcome

Session 1 9:30 - 10:45 Dollar Store Race: jig saw activity
Teachers use dollar store items to play a cognitively engaging game as a precursor to the study of 'motion'. This is followed by a jigsaw strategy utilizing a guided inquiry worksheet linking basic motion terms to the game.

10:45-11:15 Break

Session 2 11:15 – 12:30 Bungee Contests: context-rich problem solving
Students apply the concepts of static equilibrium, conservation of energy and projectile motion in a series of contests to predict and test the behaviour of a mass and a bungee rope.

12:30 – 2:30 LUNCH & Break

Session 3 2:30 – 3:45 PER Overview: guided inquiry
Teachers will consider the guiding tenets of Physics Education Research (PER) and how to apply the principles to the much broader high school audience. The constructivist basis of inquiry education will be examined, with particular attention to modifying classroom practices and the incorporation of instructional intelligence (II) strategies.

Session 4 3:45 – 5:45 Stress relief: **work hard and play hard – finding a balance**
Roberta and Dave have observed through 5 summers of teaching teachers that all work and no play is counterproductive. They have elected to 'hard wire' time for R & R into the camp program. Prior to the camp they will organize fun physical activities by email.
Some suggested activities: bike rides, nature walks, yoga, (fun) martial arts with Dave, art, games.

5:45 – 6:45 PM Pizza dinner (or alternate fare – to be decided on site)

Session 5 6:45 – 8:00 Wave Nature of Light: whiteboarding
Teachers will be introduced to many cheap and intriguing demonstrations of the wave nature of light. They will examine how these can be introduced with whiteboarding to provide opportunities for students to develop their skills in initiating and analysing investigations and provide lots of assessment during the lesson.

Thursday Aug 12

Session 6 8:45 – 10:00 Hands-On Special Relativity: peer instruction
Teachers will examine how special relativity can be made more visual using space-time diagrams. They will examine how peer instruction can take an abstract topic and make it more engaging for the students. They will be given a short video from TRIUMF that lets their students do an experiment involving relativistic momentum, which will allow them to improve their skills in analysing and interpreting experimental data.

10:00-10:30 Break

Session 7 10:30 – 11:45 Practical Exam: culminating inquiry
Teachers will play the role of students in carrying out a culminating practical exam based on the inquiry design, followed by a detailed assessment of the tool. Development of the continuum of inquiry skills, as set out by the new Ontario science curriculum, will be examined.

11:45 – 1:45 LUNCH & Break

Session 8 1:45 – 3:00 GPS and Relativity: think pair share
Teachers will explore how gravity and speed must slow time and how this is used in the GPS The strategy of think pair share will be examined as a tool to encourage the full engagement of all students. Each teacher will receive a short video and related activities from the Perimeter Institute.

3:00-3:30 Break

Session 9 3:30 – 4:45 Dollar Store Physics: guided inquiry worksheets
Teachers will participate in a series of fun and engaging guided inquiry worksheets featuring dollar store 'apparatus'. Particular attention will be paid to the scaffolding of activities and taxonomic levels and sequencing of worksheet questions.

Session 10 4:45 – 6:45 Stress relief: work hard and play hard – finding a balance
Once again we will take the time to de-stress with your physical activity of choice.

7:00 – 9:30 PM Dining in Ottawa
Participants are encouraged to take part in an evening of fine dining in Ottawa with their science camp colleagues. Dave & Roberta will scout out a restaurant with a reputation for reputable fare at reasonable prices. It is also appreciated some will have made plans to meet friends or family for the evening. It's all good.

Friday Aug 13

Session 11 8:30 – 9:30 Quantum Reality and Uncertainty: PEOE
Teachers will be given a number of resources - including a quantum eraser - that will help them bring the reality of quantum mechanics closer to their students. These resources will be explored using the Predict Explain Observe Explain strategy to develop students' skills in investigating and analyzing.

9:30-9:45 Break

Session 12 9:45 – 10:45 A: Electrostatics: role playing and B: Electric Circuits
To foster development of student conceptual foundations for abstract modeling, teachers will examine fundamental static and current electricity activities to support richer conceptualization. The use of 'role playing' to illuminate difficult concepts, such as electrical potential energy and electric fields, will be explored.

10:45-11:00 Break

Session 13 11:00 – 12:00 Particle Physics is 12U Physics: integrated learning
Teachers will explore using resources from CERN and Fermilab to show how particle physics can be used to tie together the whole 12U Physics course; circular motion, conservation laws, Heisenberg's Uncertainty Principle, electric and magnetic fields, $E = mc^2$ and more.

12:00 – 12:30 Lunch & Goodbyes