



Exploring Inquiry in Science and Physics
 July 24-26, 2018 St. Lawrence College, Kingston
 Ontario Association of Physics Teachers
 Facilitators: Roberta Tevlin and James Ball

Day 1 – July 24

8:00 - 8:45 am

8:45 - 10:15 am

Registration and Continental Breakfast

Team Building Activities to Build Better Classrooms

A successful class is a class that works together well. Team building activities over the first few classes lead to better group work and greater success for the students. We will work through three activities which you could do with any of your classes.

10:15 - 10:30 am

10:30 - 12:00 pm

Coffee break

Global Warming

Explore how you can involve your students in inquiry-based learning and fact-based discussion of the evidence and cause of global warming. You will work in small groups with graphs, simulations and engaging demonstrations to build a deep understanding of this extremely important topic.

12:00 - 12:45 pm

12:45 - 2:15 pm

Lunch

Climate Change

This session introduces the many rich activities in Perimeter's latest resource for teachers that will help your students examine the far-reaching effects of climate change. Computer simulation will allow you to make predictions and test them. You learn about the wide range of actions that can be taken to slow climate change.

2:15 - 2:30 pm

2:30 - 4:00 pm

Coffee break

Smart Phone Apps

Bring your phones, iPads or laptops and test-drive a selection of apps that will engage your students so that they have the tools to use inquiry to build their understanding of science.

4:00 - 4:15 pm

4:15 - 5:45 pm

break

Waves

We will examine Perimeter's latest resource for grade 11 physics. The workshop will involve modelling wave behaviour and the function of the inner ear. We will also model using Sonar/Ultrasound to "see with sound". The last activity will involve examining acoustic resonance in a novel and more accurate manner.

Day 2 – July 25

8:00 - 8:30 am

Continental Breakfast

8:30 - 10:00 am

Gravity Assists

How can a planet help propel a space probe without using fuel? This session will make the problem more concrete with simple demonstrations and how energy bar diagrams can help your students develop a deeper understanding of conservation laws in general and gravity assists in particular.

10:00 -10:15 am

Morning Break

10:15 am - 11:45 pm

Energy

Perimeter has created a resource aimed at making the concept of energy less abstract. We will use dollar store toys to help understand energy transformations. Energy flow diagrams will help students understand efficiency and where energy is "lost". Dark energy will be examined as an example of conservation of energy.

11:45 - 12:30 pm

Lunch

12:30 - 2:00 pm

Cooperative Group Problem Solving

In this session you will experience how a small group can solve realistic, interesting and more challenging problems by working together. See how this powerful approach can be used with students in science as well as physics.

2:00 - 2:15 pm

Coffee break

2:15 - 3:45 pm

Math Works!

Many textbook questions in science, math and physics are not only boring but completely unrealistic. This is no way to motivate learning! In this session, you will be involved in solving math problems where it actually works. Instead of checking the answer in the back of the book – you will check with nature by making a measurement!

3:45 - 4:00 pm

break

4:00 - 5:30 pm

Make and Take

Deep learning can come from working with very simple, common and cheap materials. During this session you will put together several resources that will keep your students deeply engaged.

Day 3 – July 26

8:00 - 8:30 am

Continental Breakfast

8:30 - 10:00 am

Concepts Schmoncepts

There are a number of fundamental concepts that students struggle with. Evidence suggests that a deeper conceptual understanding leads to greater student success. The concepts we will examine will be electrical resistance (grade 9), refraction (grade 10), Newton's first law (grade 11) and impulse (grade 12)

10:00 -10:15 am

Morning Break

10:15 am - 12:00 pm

Modelling Particle Models

Throughout high school students are expected to develop a familiarity and understanding of different particles – from atoms and molecules to electrons and neutrinos. However, these are abstract models of things we can't see. You will explore how Lego, magnetic marbles and dice can help make these models more concrete.

12:00 – 12:30 pm

Lunch