Energy Basics and the Greenhouse Effect Lesson Plan

**Objective**: Introduce students to the basics of energy. Brief overview of the laws of thermodynamics and why efficiency is important. Explain how conventional energy is produced in power plants and distributed to the grid. Discuss how the greenhouse effect works and is intensified by fossil fuel use.

**Time**: 40 minutes

**Materials**: Stirling engine (depending on the variety, lighter, candle, hot water)

**Procedure**:

1. Introduce the history of anthropogenic climate change as a scientific concern. Discuss the newspaper clipping and what they thought this might mean for the future, and what its implications are today.
2. Ask students what they think of when climate change is mentioned, and what this means to them.
3. Discuss the weekly schedule and give a brief overview of what each of these topics will include. For example, week two is an introduction to conventional energy production, essentially how power plants work, and we will then discuss the relationship between fossil fuel emissions and the greenhouse effect.
4. Introduce the philosophy of the course, emphasize that this is based in fact and empirical research. We will not bring personal beliefs and this but we will explain the science of the issue, possible solutions that are being employed, and some ways that you can help.
5. Discuss the goals of the class. Emphasize that we want you to understand the breadth of the problem, not merely suggest that becoming a vegetarian or buying some solar panels is the solution. Change has to come from the institutions to make a big difference.
6. Introduce necessary vocabulary for the course. What is sustainable development, renewable energy, anthropogenic climate change. Why does this matter, and why should we care?
7. Close with what inspired YOU to teach this course, why do you care about sustainability and why do you think they should care. Get the students excited about what this opportunity can create for them.
8. Introduce next week’s lesson: basics of energy and the greenhouse effect.