

## Sustainability - Science Program

## Lesson 1

### Three main focal points

- Need for and uses of energy
- Main energy sources used industrially
- By-products of energy use.

Energy uses: Heat, movement, growth/repair, generating electricity etc.

Sources: Fossil fuels, alternative sources etc.

By-Products: Water, Carbon Dioxide, other waste gases.

1. Start by reminding pupils of our use of energy in the body and the products made.  
Demonstrate Bicarbonate indicator test for  $\text{CO}_2$  with pupil volunteer.  
Watch Brainpop on "Energy Sources". (≈10 mins)
2. Initiate discussion "What else do we use energy for?" leading towards burning of fossil fuels.  
Watch Brainpop on "Global Warming". (≈10 mins)
3. Show pupils data logger set up, explain bottles represent atmosphere, lamp the sun.  
One  $\text{CO}_2$  rich, one normal air and explain what the logger will plot (rough rate of cooling).  
Remove the "sun" and start the logger. (≈5 mins)
4. Demonstrate "testing Hydrocarbons" experiment with tea light.  
(Tea light lit under funnel, suction pump carries fumes through bicarbonate indicator) (≈5 mins)
5. Watch Brainpop on "Greenhouse Effect".  
Come back to logger results.  
Explain the results and then lead on to "scaling up" from bottle size to atmosphere size. (≈10 mins)