

"The Sun as a source of Heat and Light"

Subject: Biology/Environmental studies

Sensor: SPX LUX light sensor and temperature sensor (HiTemp or ProTemp)

Overview:

The Sun provides heat and light energy (amongst other forms of energy) that is vital for life on Earth. This resource shows how you can look at the relationship between the amount of light observed at a particular point and the associated air temperature as well as how the amount of light varies over a period of time.

Equipment required: LogIT DataLogger
1 SPX LUX light sensor
1 Temperature sensor (HiTemp or ProTemp)

Hazards:

Children should be supervised at all times
Do not allow pupils to look directly at the Sun - explain the dangers of doing so.
Ensure the datalogger cannot come into contact with water or damp.
Always check your local regulations or the school advisory service such as CLEAPSS or SSERC for guidance on the use of any hazardous material or source.

Setup:



1. Find a secure and weather protected place for the datalogger. Avoid direct wind which could affect the result.
2. Plug the sensors into two channels of the datalogger.
3. Decide if you are going to log data either first thing in the morning or last thing in the afternoon.

Note: The photo shows a DataMeter 1000 with the SPX LUX sensor plugged into channel 1 and the ProTemp sensor plugged into channel 2. The sensor is mounted in a clamp stand or similar and then pointed towards A3 white card or paper. This captures light from the sun more uniformly. Do not clamp the datalogger too hard.

Method:

1. Switch on the datalogger by pressing any button.
2. Start the datalogger logging.
3. Leave the datalogger to log for a chosen length of time - at least 24 hours.
4. After the time period stop logging by pressing the Red button or stopping the datalogging software if connected to a computer.
5. Upload the results to a computer and view the graph.

Hint: The best location for the datalogger is outside away from the effects of wind and damp. The datalogger should also be 90° to the path of the sun.

Results:

Did the temperature change?
Did the light level change?
Did the changes take place at the same time.
Was it a cloudy day - how can you tell when a cloud passed?

Going further:

Try the experiment on different days in the week.
Try the experiment at different times of the year e.g. Autumn, Spring, Summer and Winter.
How does the location of your country affect the results - think about positions above or below the Equator.

