



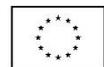
CREST Project

Living Lab experiment – Influence of natural light

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Aim of the document

This document describes the activity that has been run in the living lab settled in Temple Sutton Primary School in Southend-on-Sea.

Audience: Living lab users. Pupils from the classrooms equipped with the living lab. People attending the CREST LESS CO2 Schools workshops.



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1 Aim of the activity: Influence of natural light on a room's temperature

Goals:

- Show that natural sunlight has got a big impact on the temperature inside a room and so allows to make big energy savings.
- (optional) Show the person associated with the experiment how to use the sensors in order to be able to be autonomous on other experiments.

2 Equipment required

To realise this experiment, the following material is needed:

- A classroom with windows and curtains that can block the sunlight to come in. The experiment can be adapted with drawings or pieces of art that teachers usually like to expose on the windows.

- A Zlum monitoring light intensity inside the room.



- A Zhum monitoring the temperature and the moisture inside the room.



- A temperature sensor outside of the room monitoring the outside temperature in order to have both inside and outside temperatures in parallel.

- The sensor website showing the figures.



- A living lab user being able to follow the protocol.

3 How to run the activity

Position a Zlum facing up on a desktop. A Zhum must also be placed in the room.

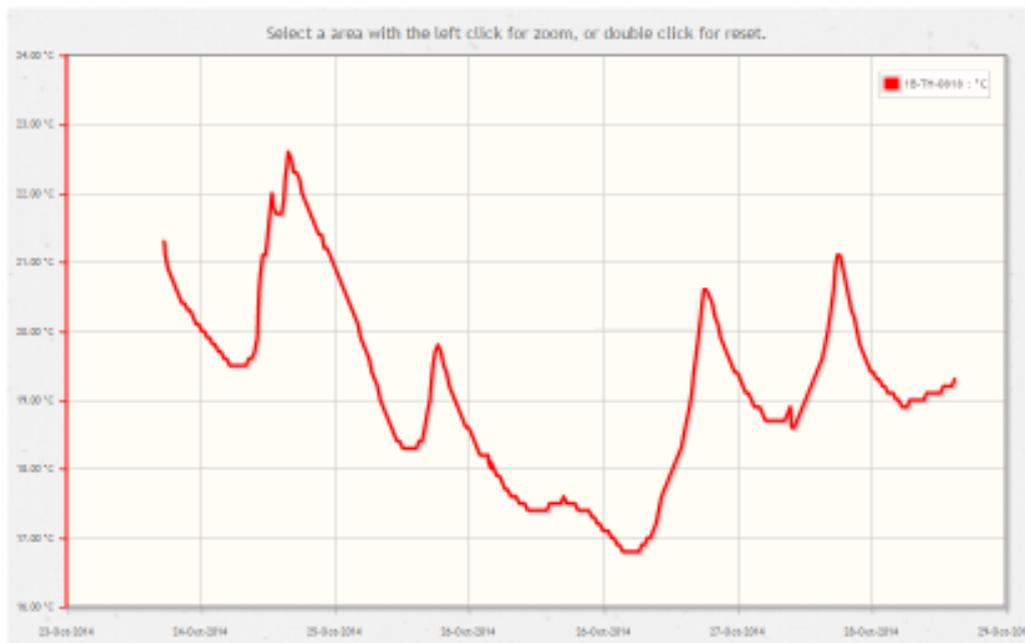
At the same time the external temperature sensor must be placed just outside of the room in order to get both temperatures inside and outside of the room at the same time.

Let the experiment run for a whole week.

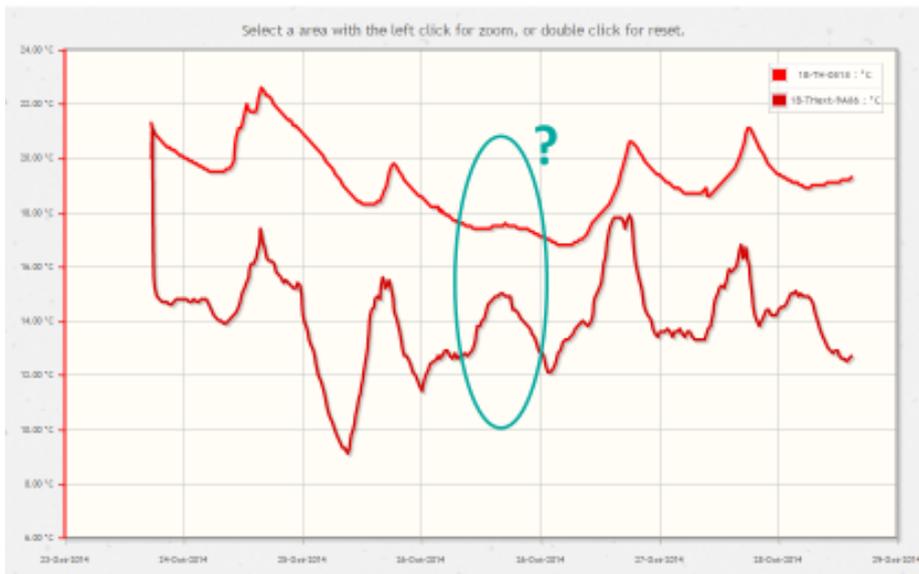
4 days out of 5 during the week, everything is left as it is. And one day, all the curtains must be closed all day long (in this example, that day is the 16th of October).

Temperatures inside and outside of the room must then be put on the same figure in order to compare the variations throughout the days. On top of those curves, inner light must be placed on the same figure.

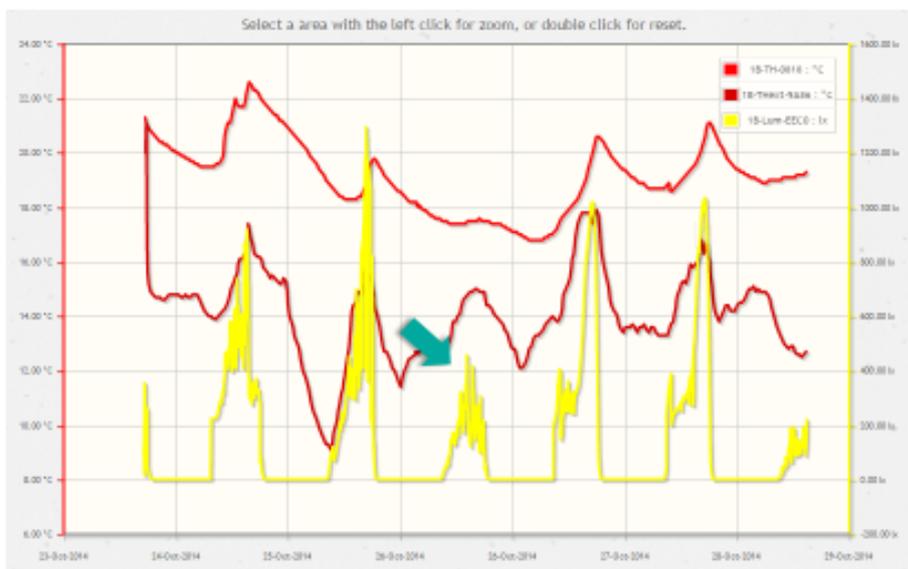
4 Results



Here's the temperature inside the classroom monitored during a whole week. We can notice the oscillations throughout the days with the peak temperatures around midday and lowest ones at night. The only day where the temperature does not really rise during the day is on the 16th of October.



Here's now the outside temperature aligned below the temperature inside the room which is above (higher temperature). We can clearly see that both curves have the same oscillations, the inside temperature is dependent on the outside temperature (which can show a problem of insulation but it's not the point of this experiment). The only day where the temperature inside the room does not rise even though the outside temperature is increased is on the 16th of October.



When we align the light reaching the room we can clearly see that on the 16th of October, there's much less light coming in the room. This has a big impact on the inside temperature then as the sunlight is not helping heating the room.

This experiment allows the person in charge to show the influence of natural light on the temperature inside a room. It is then important to remind people that windows should always left clear of any drawings or pieces of art in order to save energy in the classroom.

5 Other experiments possible

It is possible to do the same experiment without closing the curtains but just watching the influence of the direct sunlight compared to a cloudy day.

It is also possible to ask the children to expose their drawings on the windows and show them the impact on the classroom's temperature.



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