## Activity 4.3 What is the effect of sunlight on the temperature inside your house model?

### The Problem:

It is easy to observe that bodies are heated by the sun shining. This can be also the case for walls of our house models. How materials can influence the temperature inside the house?

### Learning aims:

The main goal of such an activity is the analysis of solar effects on the house temperature. Specific objectives are the following:

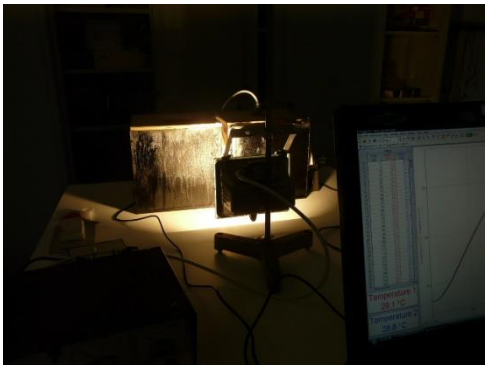
- to point out the effect of wall colours on the radiation absorption;
- to make evident that the house model temperature is affected by absorption and conduction of wall materials;
- to be able to make prediction on the basis of everyday experience;
- to be able to justify evidence on the basis of everyday experience.

### Materials:

- Boxes of different materials (styrofoam, wood, glass, aluminum, plasterboard) and equal dimensions, modeling different kinds of houses (see Activity 1_1.
- Temperature sensors to put in the wall opposite to the heater
- A light bulb simulating the sun.

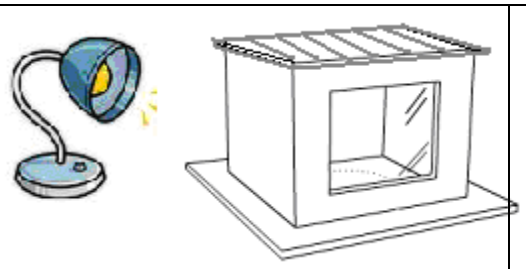
### Suggestions for use:

In order to analyse the effect of an outdoor heating source we add a very bright light bulb (200 W) outside as the “sun”.
Students are requested to test the effect using a temperature sensor posed on the wall opposed to the lightened wall.

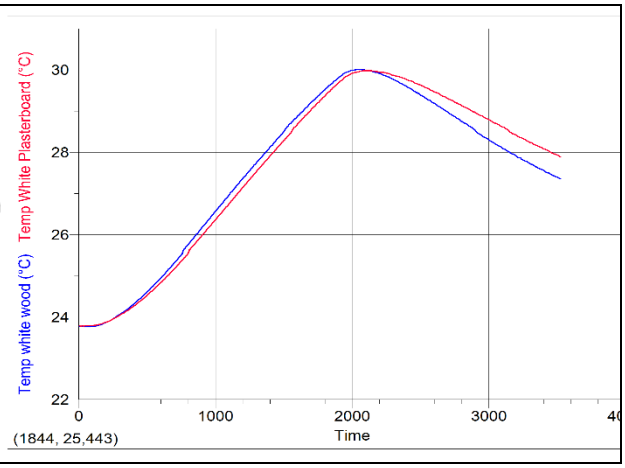


A different experiment can be performed by using both the heaters (internal and external) , for example by turning the internal heater on and off, but leave the sun on all the time.

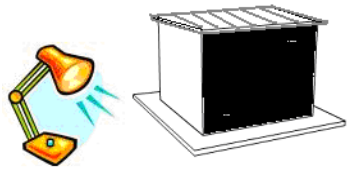
- **Two different boxes (wood and plasterboard) heated with the same "sun".**



Two models with walls of different materials are heated by the same lamp. Figure shows two heating and cooling curves.




- **Two external wall of the same box painted of different colours**



The experiment is performed by painting black and white two outer walls of one house model and lightning them by the same lamp. The figure shows the two heating and cooling curves.