



## VENTILATION ASPECTS IN SCHOOLS

### Goal(s):

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- To educate the pupils about energy efficiency in schools by focusing on windows issues (since they greatly influence the way a building is heated and ventilated).
- The pupils check for draughts and learn how to prevent them with simple measures.
- The pupils learn how to properly ventilate with minimum heat losses.

### General description of the activity:

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Many schools have poor temperature controls. Schools can be heated too much causing windows to be opened at the same time. This results in high heat losses. It also causes condensation when moist, cold outdoor air hits indoor warm and dry air.

This activity will concentrate on detecting unwanted draughts at the windows.

The pupils are taught about appropriate ventilation in schools and homes with practical examples.

A class discussion aims to establish what ventilation is and how you can have 'good ventilation' (required for adequate oxygen levels) and 'bad ventilation' (unintended draughts).

The pupils study the windows in classes where they check the tightness of the windows with a very simple test. They open the window, put the paper into the frame and close the window. If they can pull the paper back out, then the windows are not tight enough. They see if there is a reason for this e.g. frames are rotten or warped etc. They can check several windows in school and write a report.

After the pupils learn about ventilation, posters could be prepared and distributed all over school in order to pass on the information about the importance of the ventilation, how the rooms should be ventilated and also the test for tightness of the windows.

### Required materials:

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- Sheets of paper for draft checking, paper for taking notes.

### Required child skills:

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- Ability to work in a team, ability to take notes.



### How does this activity fit into the curriculum:

Science, Mathematics, Citizenship, ESD.

### Safety issues:

Some windows may be hazardous, particularly on upper stories of the building. Also beware of trapped fingers!

### Individual steps of the activity:

### Required time:

1. Explain the exercise to the children. Ventilation is important aspect of energy efficiency. Unwanted draughts can be very wasteful of energy. For supporting material you could use promotional literature available at the local energy agencies.	Introduction and preparation.
2. Explain the different methods of measuring the draft at the windows with plain paper and let them do the exercise in this class and maybe in another class. It is a very simple test. They open the window, put the paper into the frame and close the window. If they can pull the paper back, their windows are not tight enough. By doing this they should also learn about the 'right ventilation' i.e. new air to replenish oxygen levels or to distribute heat by convection currents	Exercise and analysis – 1 lesson
3. The pupils note which windows are faulty. Comparison could be made between windows in two classrooms – one on the south and one on the north of the school. Pupils age 9-10 can prepare posters about how to ventilation rooms properly and distributed to all classrooms and corridors.	
4. Supporting activity could be to form a team of child volunteers who check all windows in each classroom. They could prepare a report for school managers. Where windows are OK they could just report on whether the ventilation is adequate for good working conditions.	Exercise and analysis – 1 lesson for selected team
5. The pupils could repeat the activity at home and do a report for their parents (parents should agree to this in advance!)	

### Suggestions for combination with other AL activities:

"The energy house" – The pupils test the importance of the building envelope relative to energy consumption.

"Special energy investigators" – The pupils experiment with three types of heat transfer, namely conduction, convection, and radiation.

*[The listed activities above may change when all the activity sheets have been finalised.]*



## Variations:

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Increased complexity of the activity to suit older children: The pupils may calculate the losses of improper ventilation.

Increased dissemination: Have the class prepare a presentation or exhibition for the parents or the entire school.

## Available aids:

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Aid 1 – Background materials on ventilation

Aid 2 – Correct ventilation

Aid 3 – Relation between temperature and humidity or temperature of walls

Aid 4 – Data collection sheet



## Ventilation aspects in schools – Aid 1



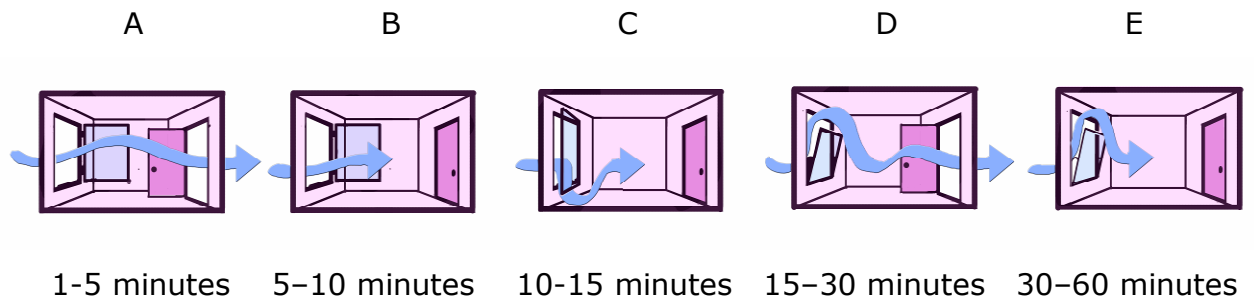
### Background materials on ventilation

[Each partner will insert their own materials]



### Correct ventilation

The time necessary for correct natural ventilation which allows a complete change of air is shown in the figure below. The required time depends on the ventilation method chosen.



A – Ventilation with wide opening of windows and doors

B – Ventilation with wide opening of windows only

C – Ventilation with slightly opened windows

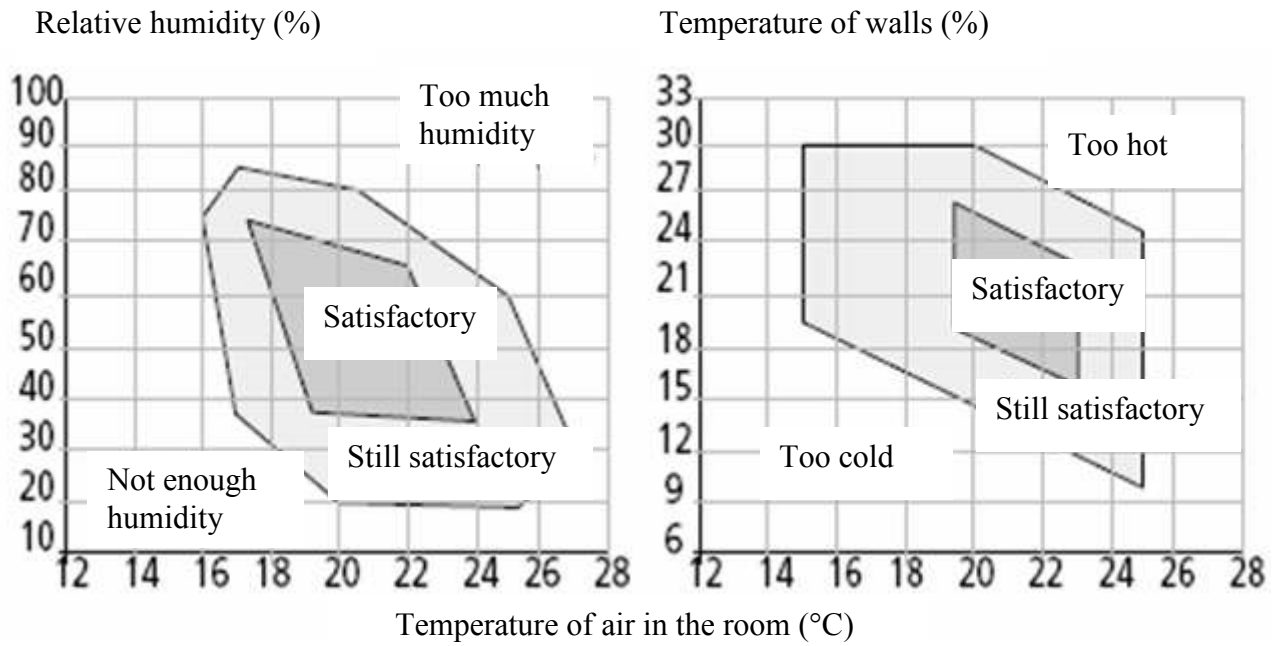
D – Ventilation with partly opened windows and widely opened doors

E – Ventilation with partly opened windows only

Source: [www.aure.si](http://www.aure.si)



Relation between temperature and humidity or temperature of walls



Source: [www.aure.si](http://www.aure.si)



Data collection sheet – Classroom A

Window	Tightness is poor	Tightness is OK	Windows should be replaced

Data collection sheet – Classroom B

Window	Tightness is poor	Tightness is OK	Windows should be replaced



## Ventilation aspects in schools



### Search words:

<b>Energy topic</b>	<b>General topic</b>	<b>Educational subject</b>	<b>Age level</b>
Transport	General sustainable development	<b>Mathematics</b>	<b>6-8 years</b>
<b>Space heating &amp; cooling</b>	Renewable energy	<b>Science</b>	<b>9-10 years</b>
Hot & cold water	<b>Energy efficiency (saving)</b>	<b>Citizenship</b>	<b>11-12 years</b>
Lighting	CO <sub>2</sub> wise transport	<b>ESD</b>	
Electric appliances			