

# ARE WE HOT? OR ARE WE NOT?

## Temperature and humidity at Nannaskolan

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### Nannaskolan

Our study was conducted at Nannaskolan, which was originally built in 1879. The school underwent extensive remodeling in the 1960s to modernize and adapt to new regulations. Today, 450 students attend Nannaskolan, which is divided into four floors. On each floor there are hallways where the classrooms are located (see figure 1).

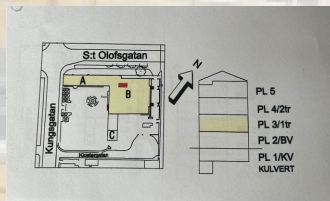


Figure 1. Map of the school

### What are we using?

We used an Arduino IDE 2.3.4 and a DHT11 temperature and humidity sensor configured according to the instructions. (See figure 2)

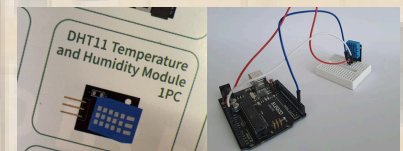


Figure 2. The temperature and humidity module used for the measurements.

### Where did we measure the temperature?

We choose to measure the temperature in the far end of each hallway, and by the stairs on each floor. The ends of the hallways are less frequently used by the students, compared to the area by the stairs where it easily gets crowded. Therefore our hypothesis states that many students and teachers in the same area, will cause the area to heat up. That because of people talking and exhaling, which we believe rises both temperature and humidity rate.

### Results

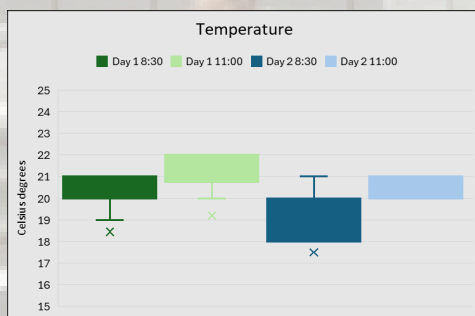


Figure 3. Temperature variation at the school in two independent days (day 1 and 2). We also measure before the students started at the school (8:20) and after, when the day is ongoing (11:00).

The school owner controls the conditions in an external way to follow the working environment's rules. In our research (see figure 3) we can see that there was a change in the temperature. We see that there was an increase in the temperature on both days when the students' school day was ongoing apart from the beginning of the school day. In both cases the changes are in the span for the working environment conditions rules.

In figure 4 we see that there can be a significant difference in the humidity from days, this can we correlate with outside temperature those days. Day 1 was warmer than day 2 (5 respective 0 celsius degrees)

### What did we compare with?

To make our measurements even more interesting, we also compared the results from the indoor environments with those we got outdoors. We wanted to investigate if the weather conditions such as temperature and humidity outside the school had any effect on the climate inside. By making this comparison with a broader understanding of how both the movement of people and the external weather conditions can affect air quality and comfort in different parts of the school.

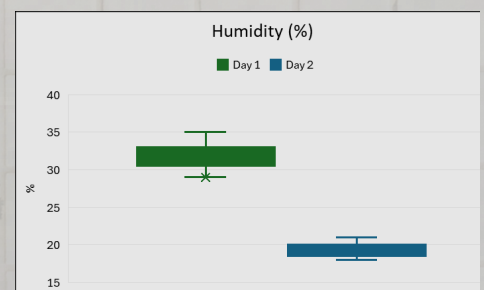


Figure 4. Humidity variation at the school in two independent days.

### Conclusion

- The temperature in the building is higher in the presence of students.
- The humidity is lower when the outside temperature is lower.
- Even if there is an old building, the control of the parameters are effective and follow the working environment's rules.