

## Guidelines for CO<sub>2</sub> monitoring report

Date: May 2023

The purpose of this document is to propose a scheme for the reports on the CO<sub>2</sub> monitoring experiments carried out in school environment, such as classroom, gym, canteen, library to mention some possibilities.

The CO<sub>2</sub> monitoring report is a written document. It must be made by the students and can be made either as a document or as a presentation. The function of the monitoring report is dual: it's a learning evaluation tool and a data source. The report must be divided into sections: Introduction, Data, Comments and Conclusions.

The **Introduction** explains the background and the scope of the work. This section can include description and CO<sub>2</sub> data of the preliminary experiments (e.g. photosynthesis).

Much attention has to be dedicated to the data presentation and elaboration.

The CO<sub>2</sub> monitoring report must contain **one plot of the CO<sub>2</sub> concentration as a function of time for each day of continuous monitoring in classroom**. The plot can be drawn with a program (e.g. Excel, OpenOffice Calc) or can be a screenshot of the webapp. The suitable **XY scale** must be chosen in order to highlight the reported phenomena. An example is provided in Figure 1.

AB High School, Class N  
Date =4/6/2022  
Activity = Frontal lesson  
Number of people =24  
Classroom size = 20 m<sup>2</sup>

OW= Open the window  
CW = close the window

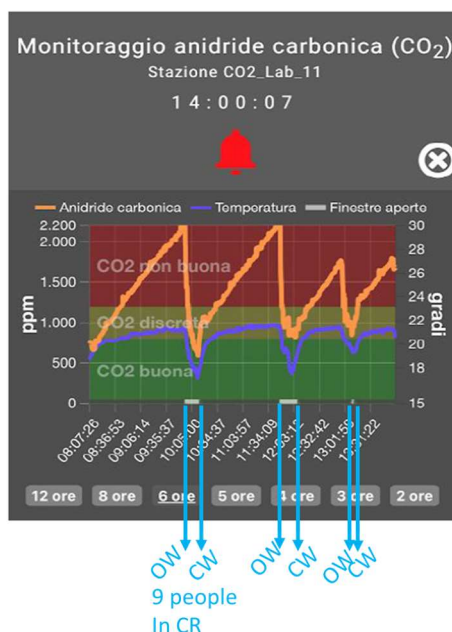


Figure 1. Example of a daily plot with comments.

The information that must be correlated to the graphs in order to appropriately validate the data are:

- **classroom size:** surface (m<sup>2</sup>), volume (m<sup>3</sup>).
- CO<sub>2</sub> monitoring station **position:** it can be accompanied by a photo or by a map of the classroom. The **height** and the **distance** from the closest CO<sub>2</sub> source, usually a person, are useful information.



- Useful information can be also the **activities** carried out in the room (e.g. sport, lunch, cleaning), mainly in case the monitoring is carried out in a place other than a classroom.
- Each datum, i.e. each point, should be correlated to the **number of people** in classroom (students + teachers) and to the **window status** (open/closed).
- Correlation between the window status and **temperature**.

This checklist must be used for a peer to peer validation of the data (see Suggestion 2).

**Suggestions**

1) Though the monitoring stations collect several measurements per hour, the variations in the number of people and window status are less frequent. For this reason, it is enough to annotate the moment when variations happen, such as window opening or people exiting the classroom. An example of activity log is shown in Figure 2. **The Activity Log must be attached to the report.**

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**Event log to be used in CO<sub>2</sub> monitoring experiments**

Type of activity: Frontal lesson

**Info about workspace**

School and Class X High School, Class YZ

Room destination Classroom

Room surface 18 m<sup>2</sup>

Room volume 54 m<sup>3</sup>

Number of windows \_\_\_\_\_

Window opening surface (0.6\*1) m<sup>2</sup>

Position of monitoring stations In the back of the classroom

Position of HVAC Above the entrance door

Average number of occupants 24

Average occupation time (school hours?) 8:15 - 13:30

Room map attached to this document

Event Log

10/02/2023

Start time	End time	Event	Notes
10:00	10:14	windows open	students out for break
11:20	11:25	windows open	
12:00	13:00	gym lesson	students out

Figure 2. Example of filled activity log document.

2) In order to have a reliable report and have all the students involved in the data collection and evaluation, it is advised to divide the class in groups of two students. Each group is responsible of at least one day of CO<sub>2</sub> dataset. Then, in the reporting phase, **each group is responsible of validating the data elaborated by another group**. This means verifying that the daily plot contains all the information.



As an alternative, it was hypothesized that a report produced by a School in one Country is validated by the students of a School in another Country. This operation, though more complex, has the advantage of strengthening the international dimension of the project.