Improving **L**earning through **C**lassroom **E**xperience

Climate, Environment and Education Adaptation Research (CLEEAR) Tanzania Steering Committee

Programme Updates
04/04/2024

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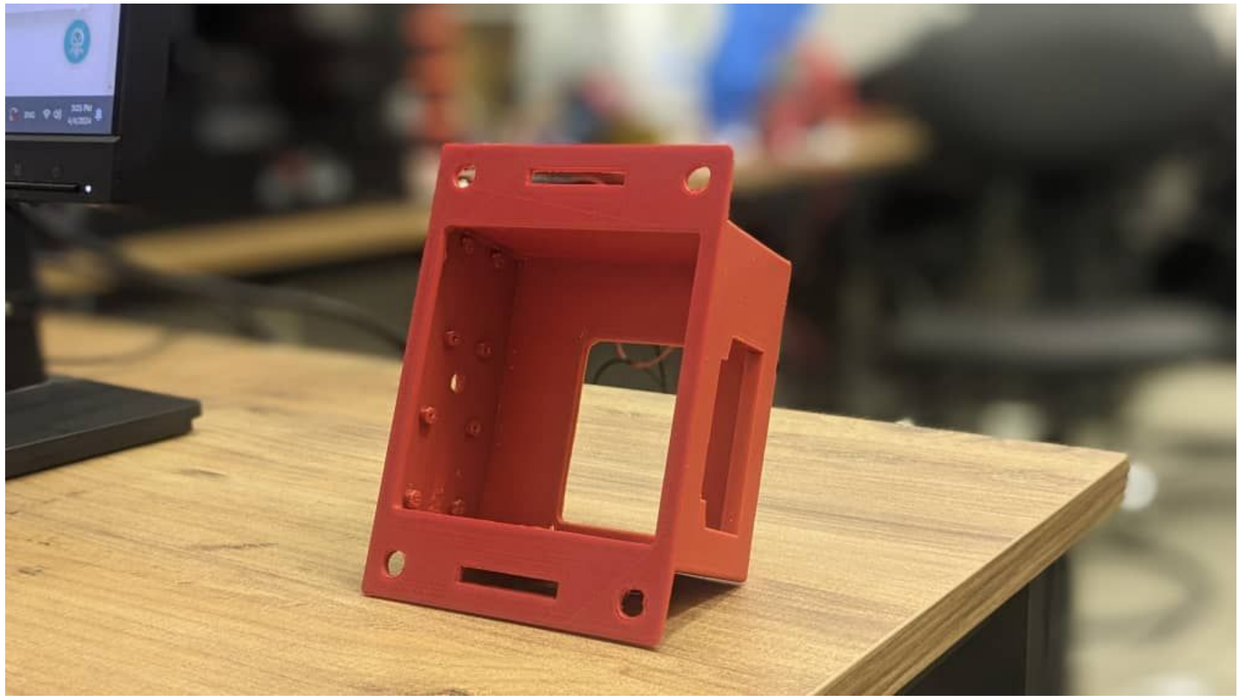
https://opendeved.net

Updates

Activities	***Status***
Updating Climate Evidence library with recent publications and UET presentations	Completed
Retrofits in Secondary school	Completed
Data collection in Secondary school	Completed
Data analysis in Secondary school	Ongoing
Retrofits in Primary school	Ongoing
Data collection in Primary school	Ongoing

Updates

3D printing at UDSM



Update: Drone pictures

https://mapstudiostz12.pixieset.com/kijichiprimary/
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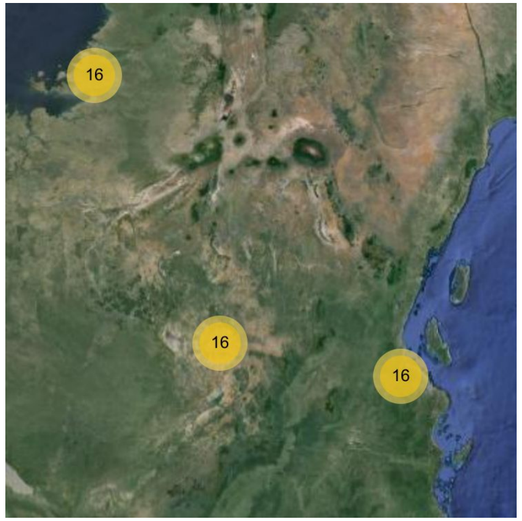
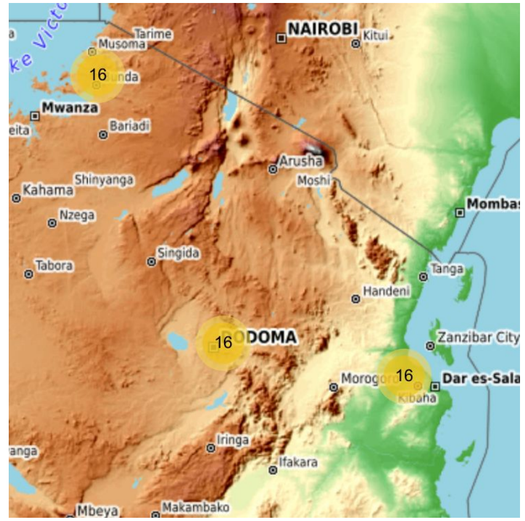
Update: Maps

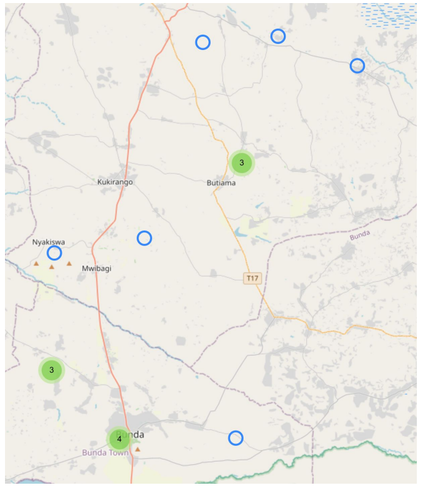
Please select your map

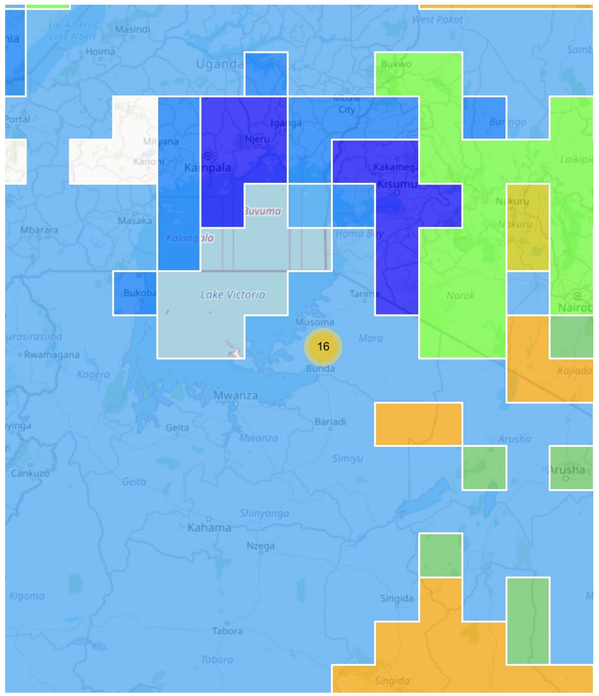
- Mkushi Health Centres
- CRIBS Nigeria
- Improvise Learning (ILCE, Tanzania)

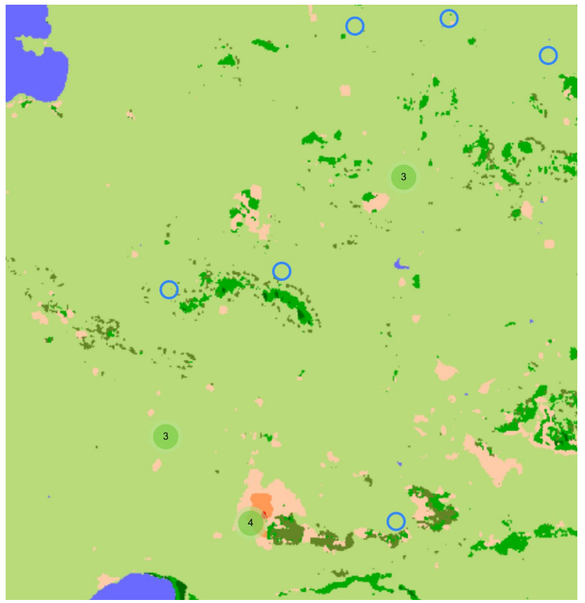
https://maps.opendeved.net





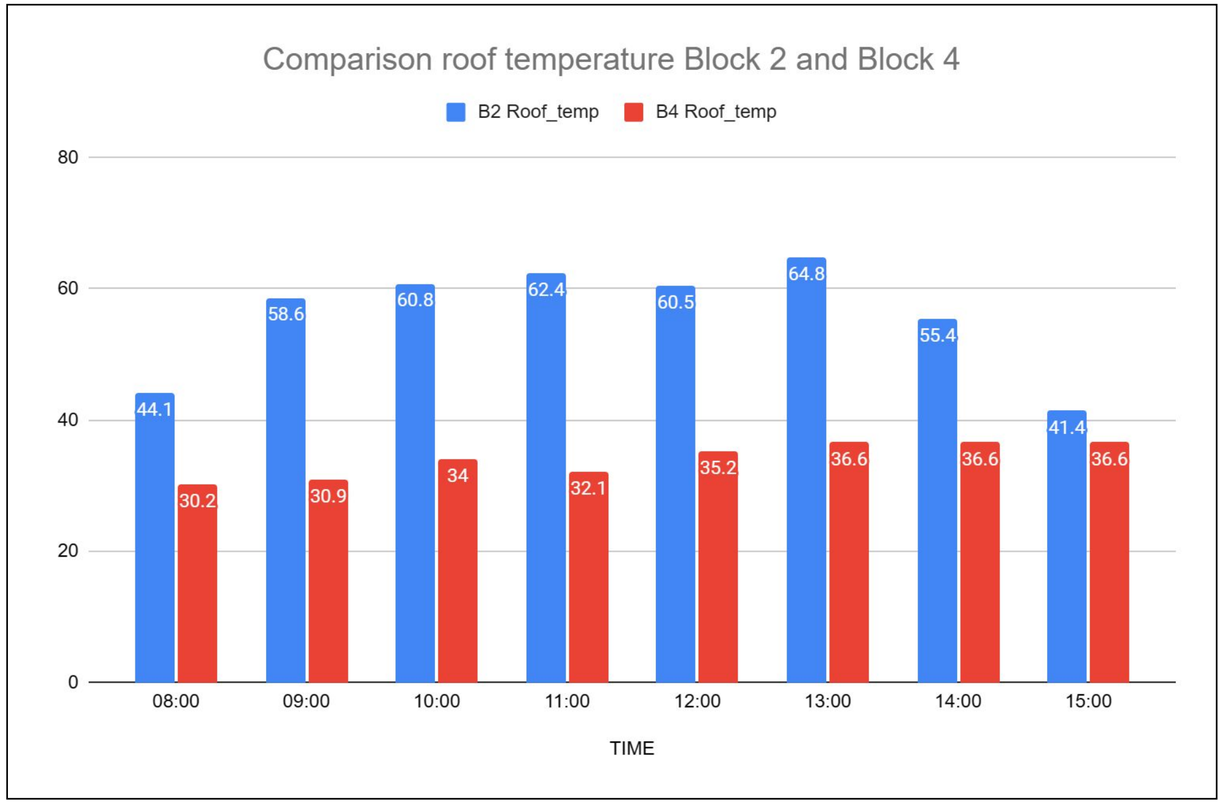


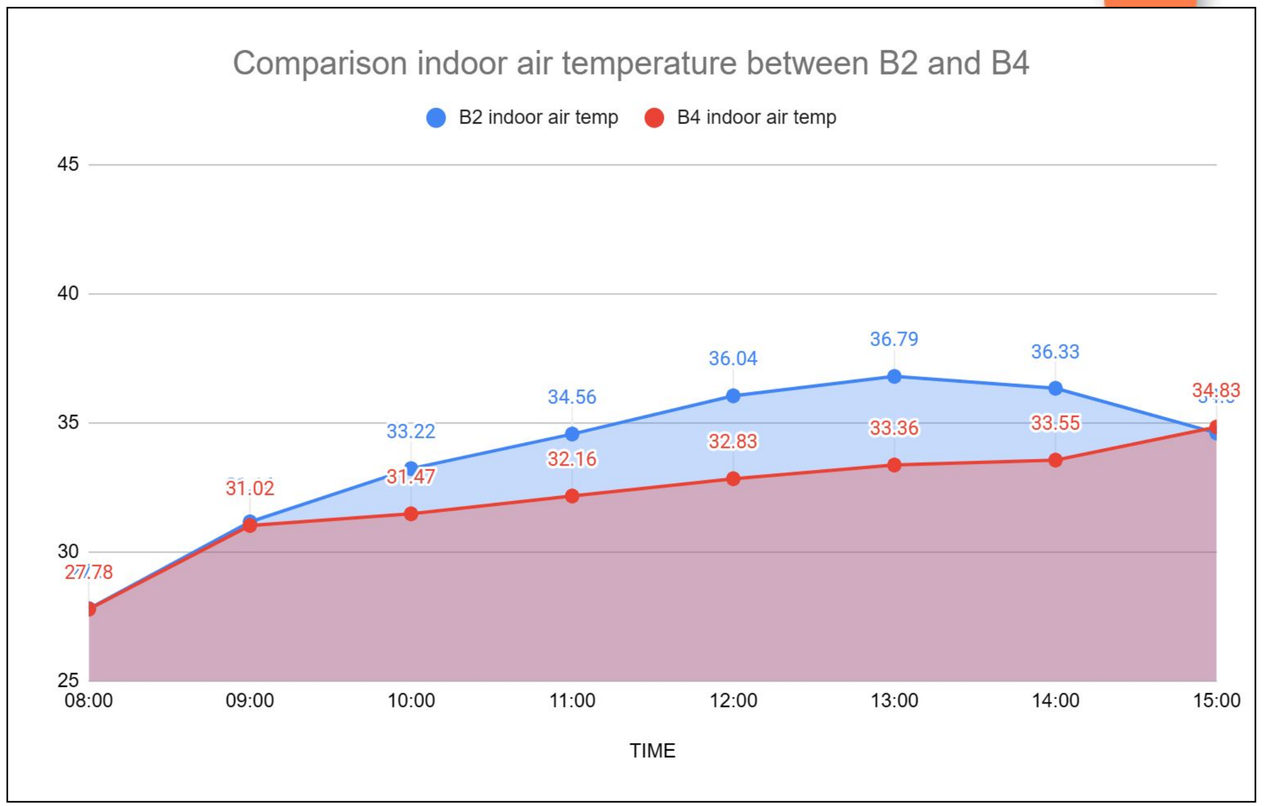




Retrofits
Kijichi Primary school

Preliminary findings: temperature



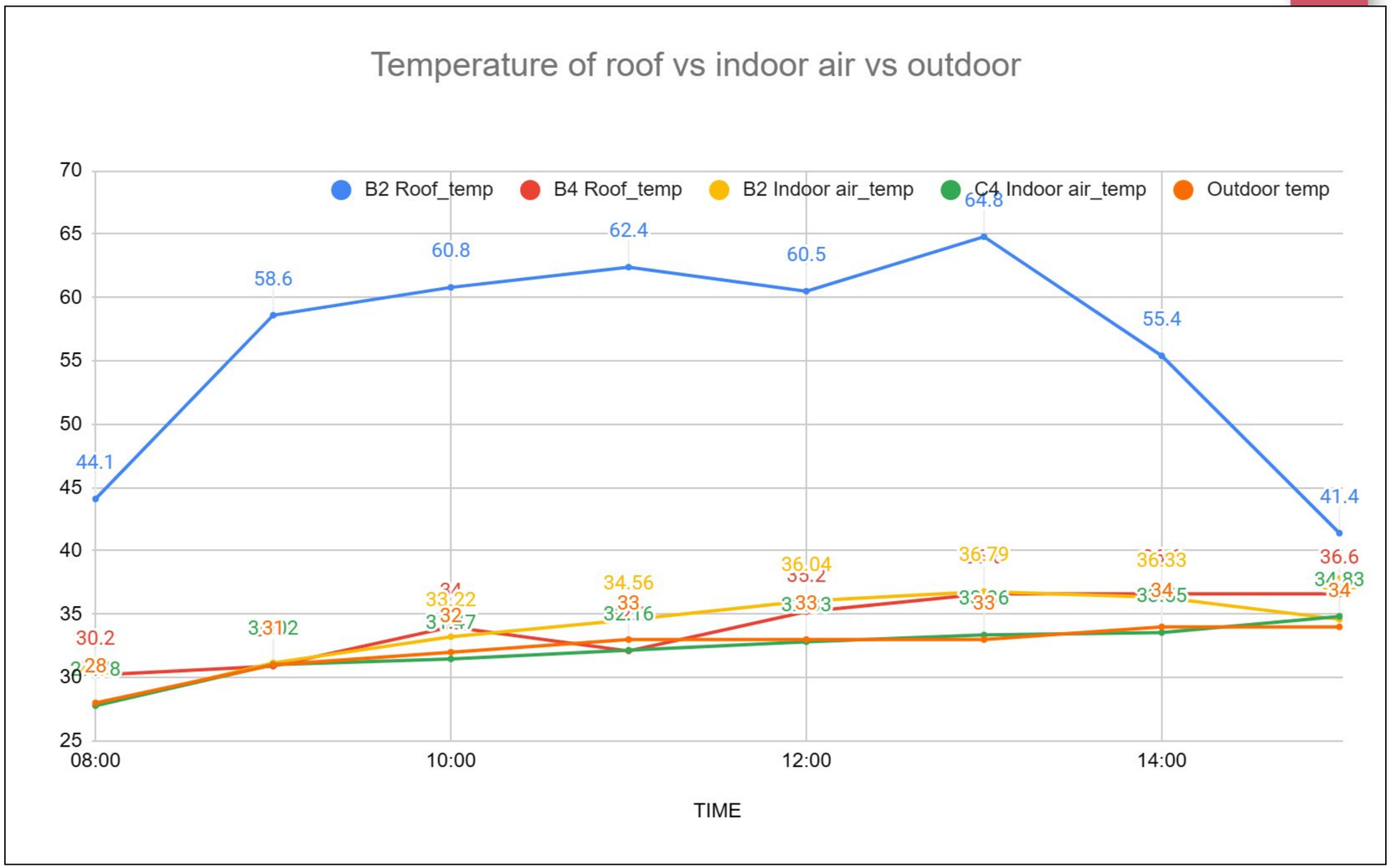


- Roof temperature of rusty block (B2) shows considerably higher values than the block with new roof (B4)

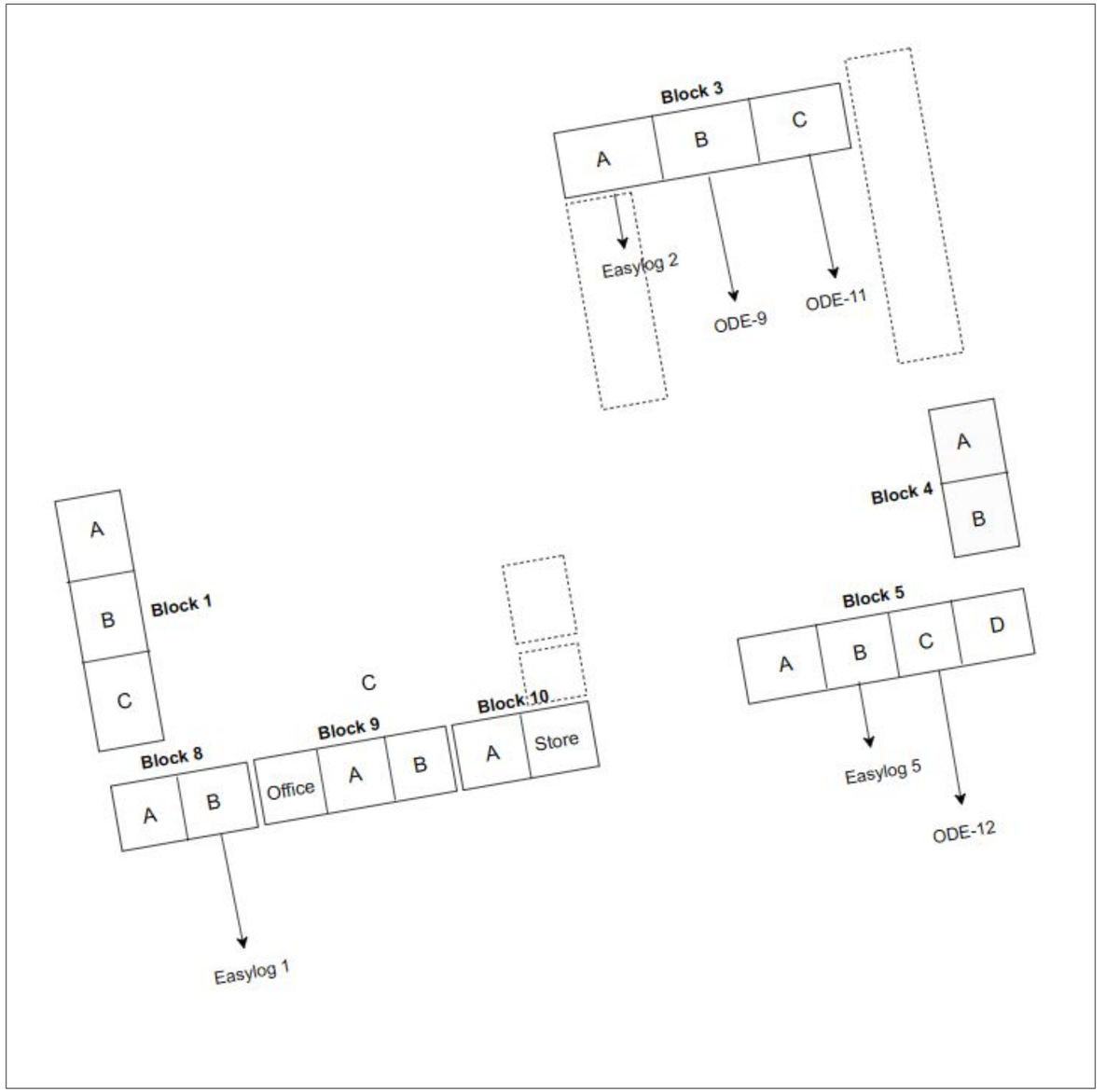
- B4 indoor temperature is in average 3°C lower than B2

- B4 indoor temperature values are similar to the outdoor temperature registered in the day

- Further experiments are needed to assess the individual impact of white paint, new roof and ceiling boards in the reduction of indoor temperature

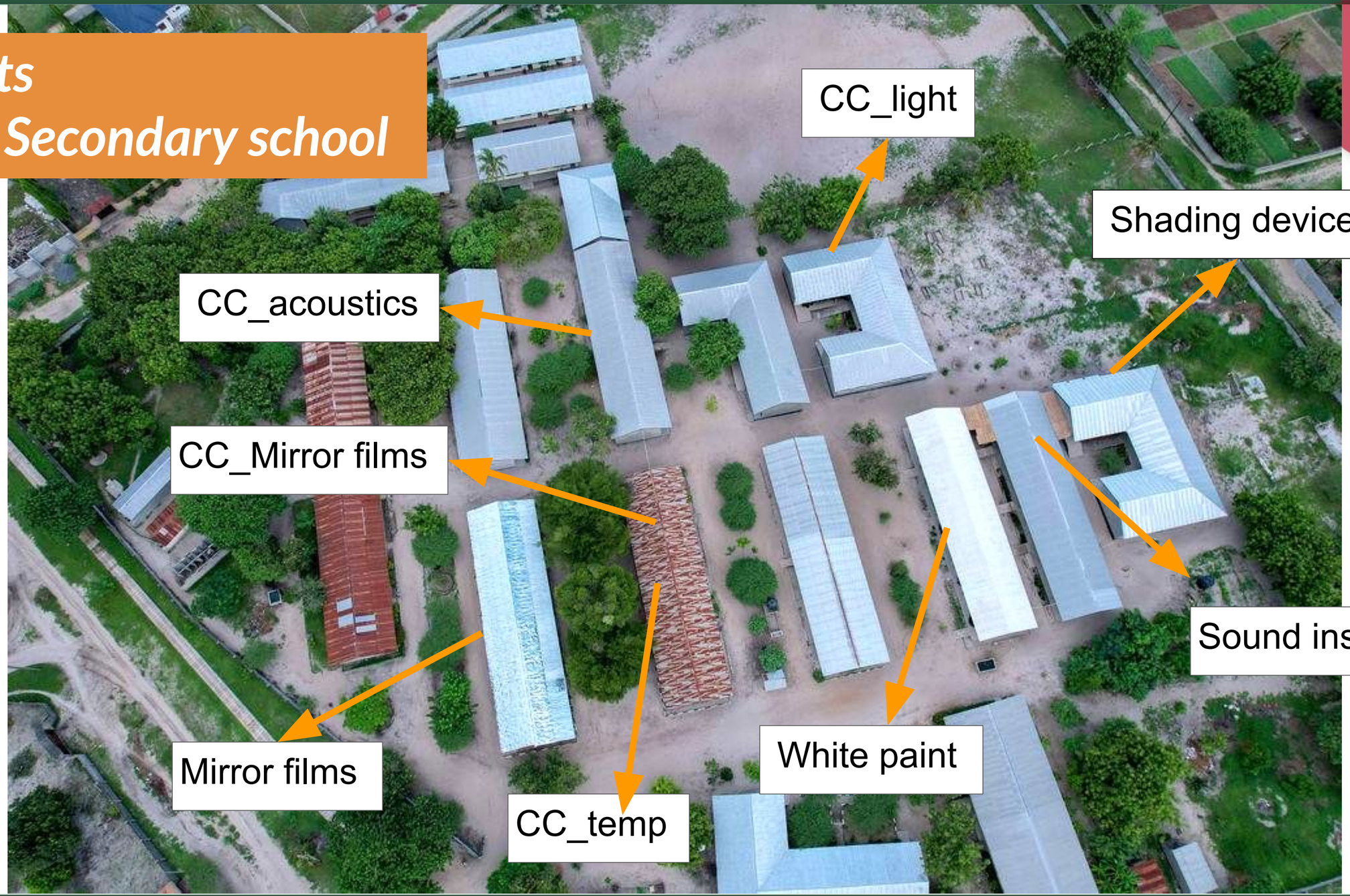


Retrofits
Kijichi Primary school



	Phase 1	Phase 2	Phase 3
Block number	**Ceiling board horizontal/ slanted**	**New iron sheets**	**White paint**
Class 3A	**horizontal**	**yes**	**yes**
Class 3B	**slanting**	**yes**	**yes**
Class 3C	**none**	**yes**	**yes**
Class 5A	**none**	**no**	**yes**
Class 5B	**horizontal**	**no**	**yes**
Class 5C	**slanting**	**no**	**yes**
Class 8A (control)	**none**	**no**	**no**
Class 8B	**none**	**no**	**no**
Class 8C	**none**	**no**	**no**

Retrofits
Kijichi Secondary school



White paint

Preliminary findings

- With ceiling boards, the difference in indoor air temperature between C2 and CC_temp appear to be minimal.
- Gypsum ceiling boards are efficient heat insulators and easy to fit.

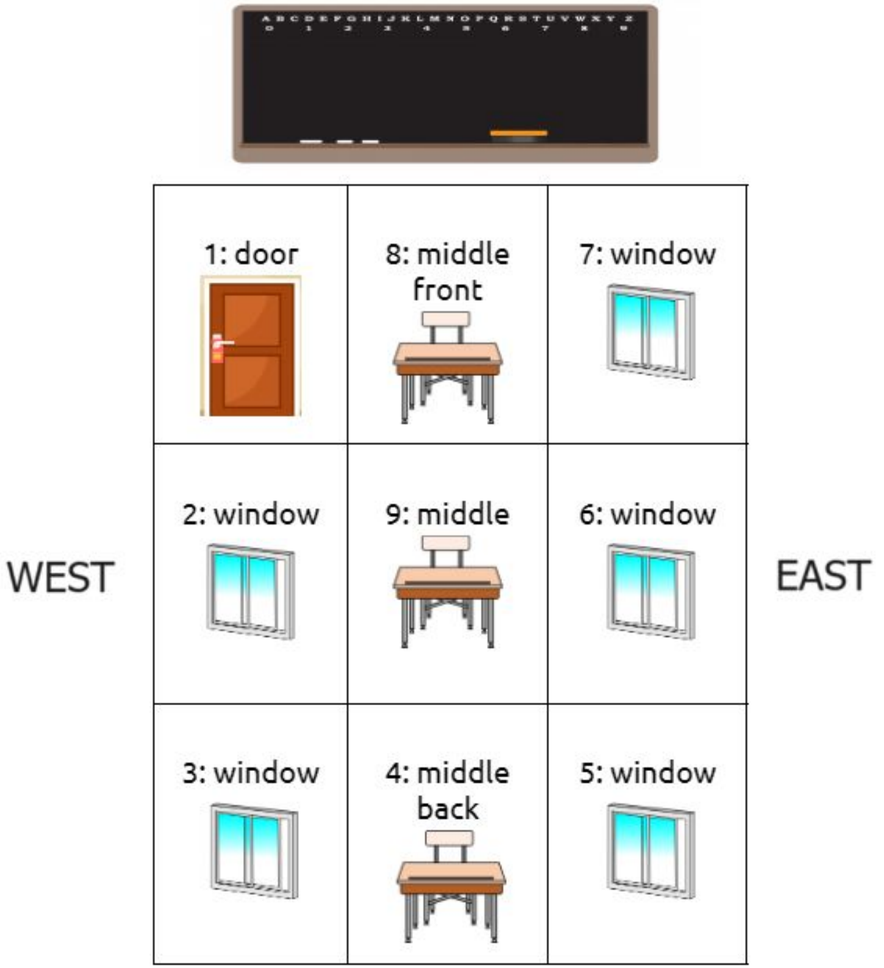
Shading devices

Measurements

- Light was measured with two light meters, one used in B3 (classroom intervened) and the other one in CC_light (control classroom for light)

- Measurements were taken three times a day; before noon (9 am to 11:30 am), at noon (11:00 am to 1:30 pm) and after noon (2:00 pm to 4:30 pm).

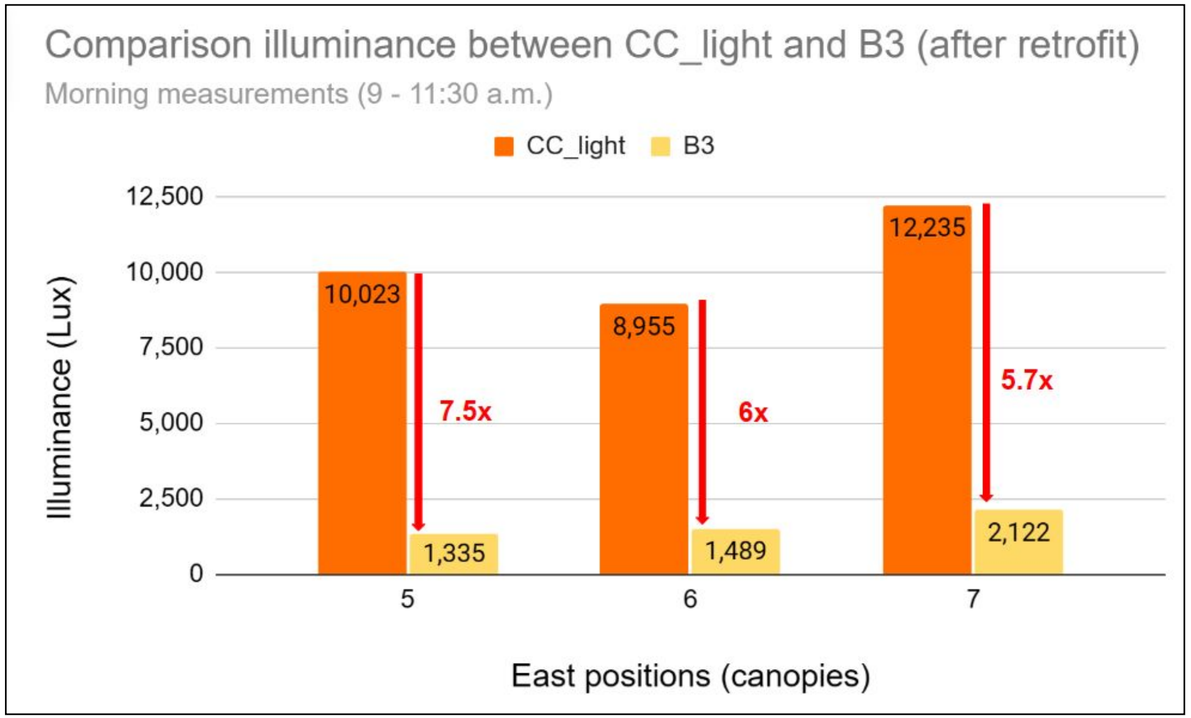
- Each time consisted of four rounds moving around the classroom with the light meter from position 1 to 9 so all the positions could be represented in the results.

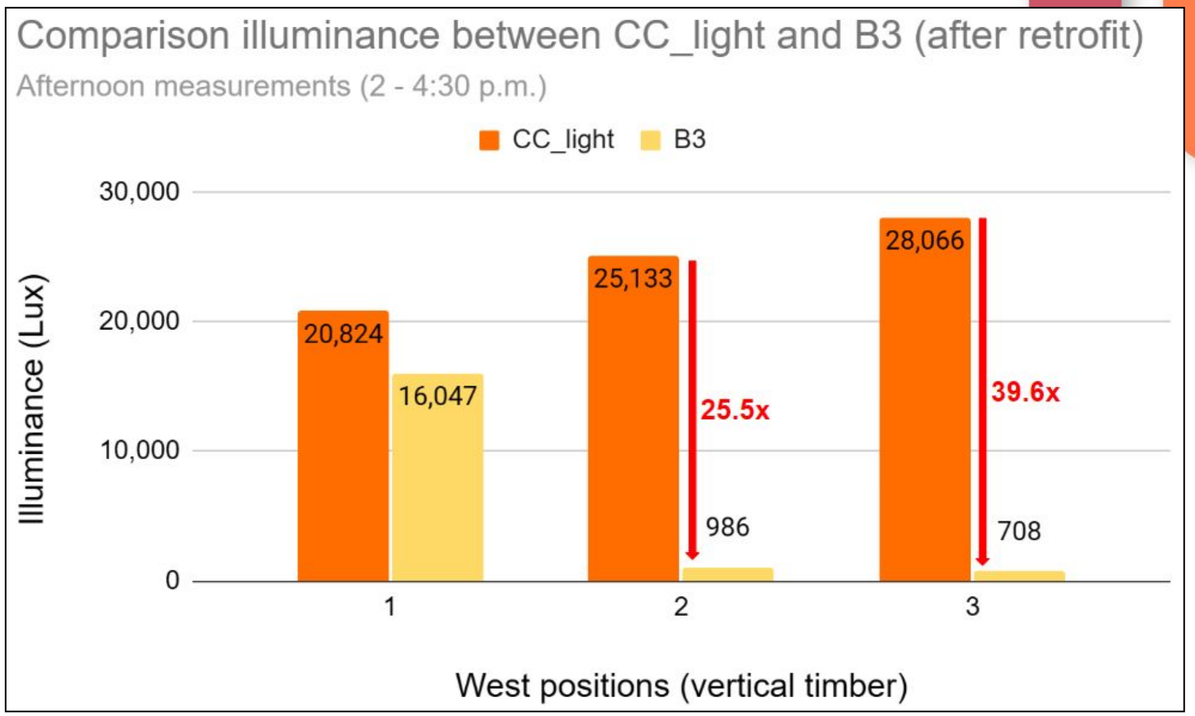


Recommended levels

Different organisations recommend a range of illuminances that goes from 300 to 750 lux for visual and writing tasks in an office or learning environment.

Preliminary findings: illuminance





- B3's illumination level is, on average, 6 times lower than that of the control classroom.
- B3's illumination level is, on average, 32 times lower than that of the control classroom.

It could be inferred that the West intervention—vertical timber—has been more effective than the East intervention—canopies—as it allowed a considerable reduction in illuminance levels

**The colour green indicates the measurements falling into the recommended range (300 to 750 lux)*

- All the positions in the CC_light classroom present values higher than the recommended ones at different times of the day

Control classroom (CC_light)

3,913	1,050	12,235
3,108	1,060	8,955
2,620	868	10,023

a) Morning

3,493	1,183	4,360
3,041	1,353	4,531
2,446	1,017	3,921

b) Noon

20,824	1,443	1,720
25,133	1,653	2,054
28,066	1,075	1,948

c) Afternoon

- B3, the classroom intervened, shows values significantly lower and some positions achieving the recommended range, which is an indication of the impact of this intervention.

Classroom intervened (B3)

3,068	548	2,122
839	751	1,489
503	642	1,335

a) Morning

3,528	628	1,380
860	819	1,170
727	697	1,147

b) Noon

16,047	724	739
986	555	545
708	586	599

c) Afternoon

- Just eight of the nine positions had some kind of shade mechanism in place. Of the eight positions, four reached 300–750 lux levels, and the other four had experienced a considerable reduction in their values.

Control classroom (CC_light)

9,410	1,225	6,105
10,427	1,355	5,180
11,044	987	5,297

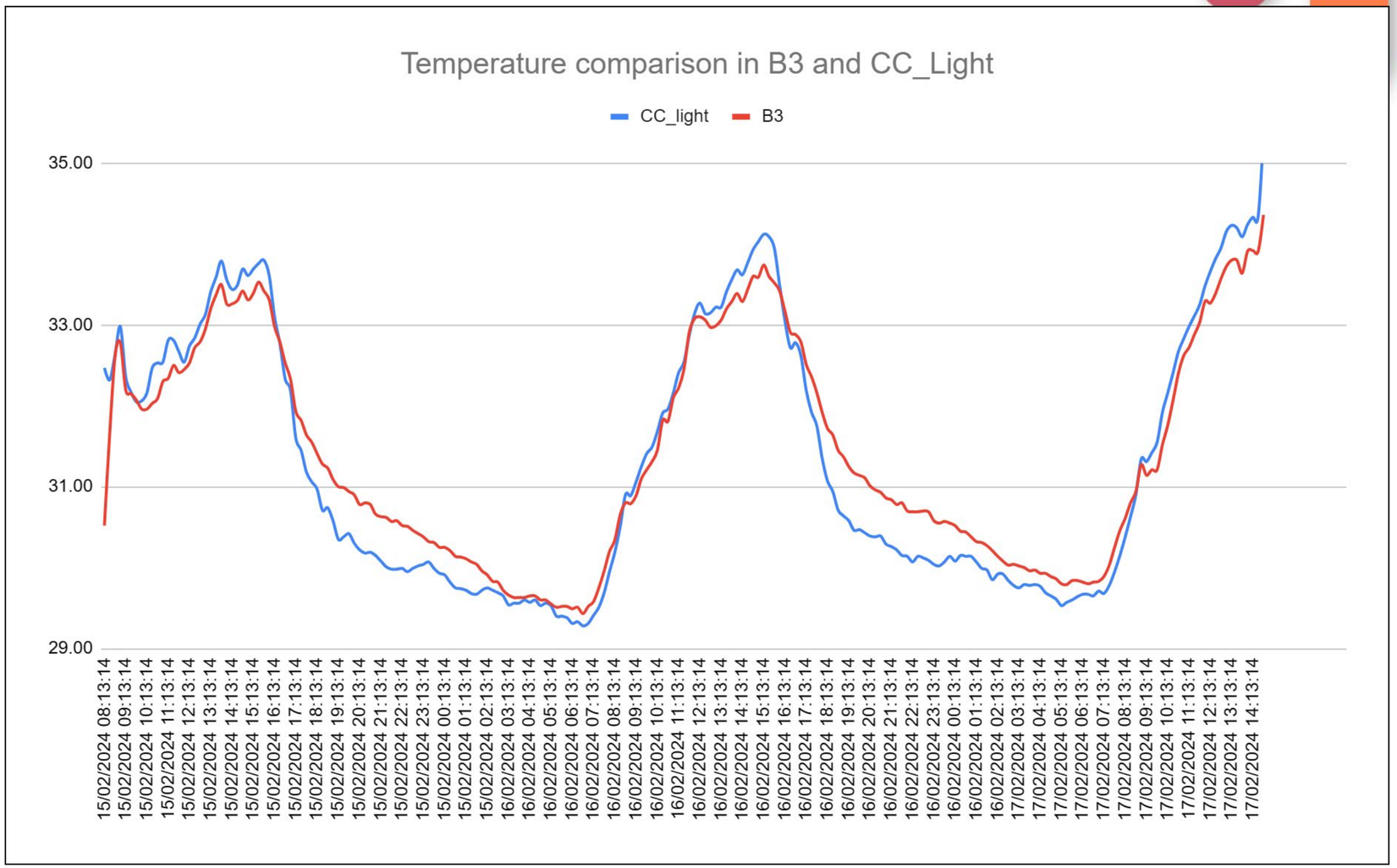
Classroom intervened (B3)

7,547	633	1,413
895	708	1,068
646	641	1,027

Average of the illumination levels at each position throughout the day.

Preliminary findings: temperature change from shading

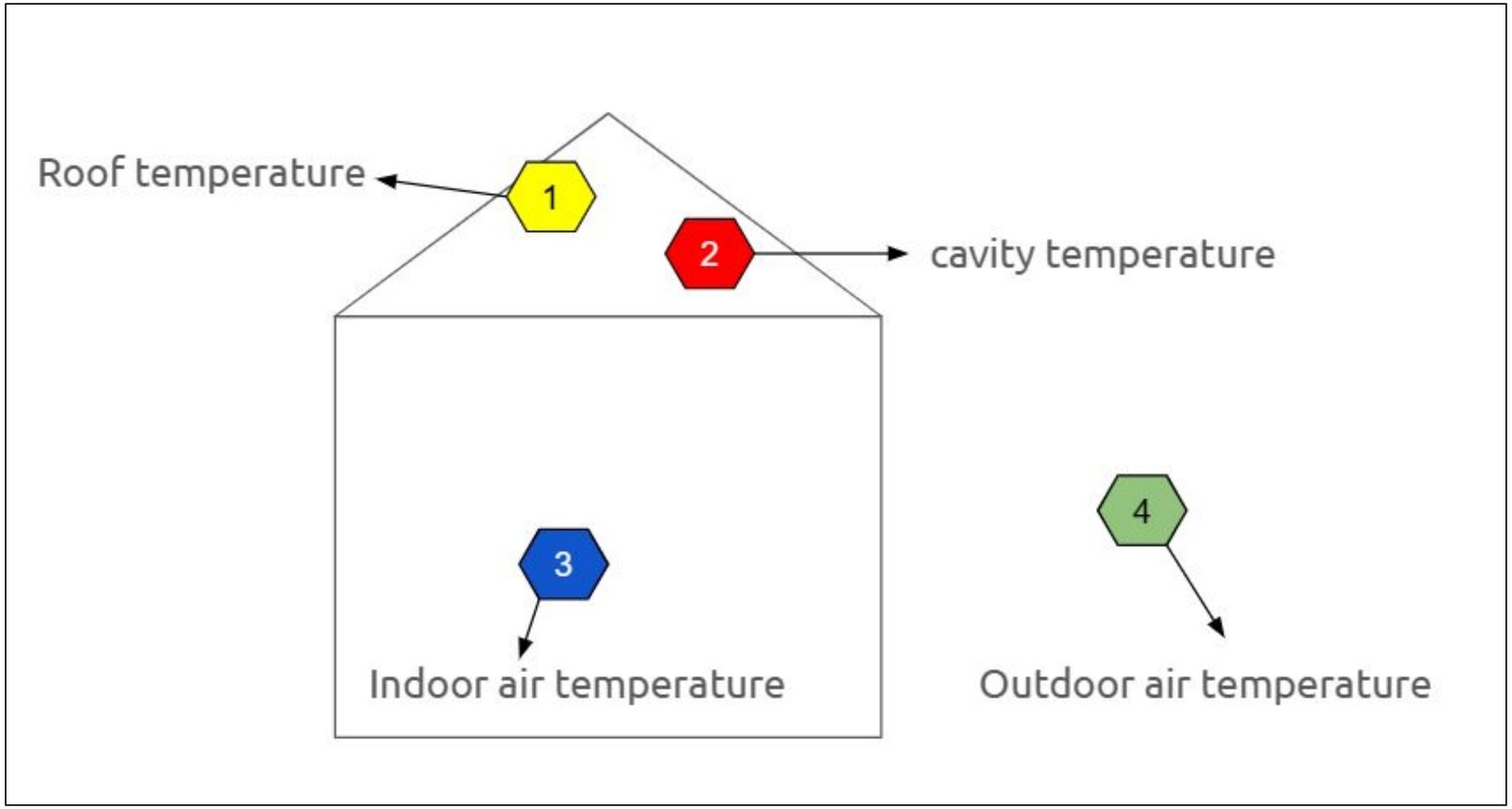
- As expected, difference in indoor air temperature between B3 and CC_light appear to be minimal (less than 1°C)



Mirror films

Measurements

- Four sensors were placed for analysing the impact of the mirror films in Block 5



Preliminary findings: temperature

- Reduction in roof temperature
- Reduction in cavity temperature

- Significant reduction in roof and cavity temperature
- Indoor temperature achieved appears to be lower than outdoor temperature (difference up to 3°C) – roof cavity may offer cooling in the classroom
- Further analysis needed