Ekoskola NEWSLETTER

ST MICHAEL SCHOOL

EkoSkola

Ħarġa No.25 Kumitat Ekoskola Apr-Ġun 2022

ATTIVITAJIET MILL-KUMITAT

Air quality Webinar Presentation
Green Flag evaluation
Xogħol fuq Serra
Ħidma fIl-Ballut ta' Marsaxlokk
Mobility Presentation
Eko-Parlament
Rovigo Erasmus Training

F'DIN IL-ĦARĠA

EDITORJAL

Din hija l-aħħar ħarġa għal din is-sena skolastika. Sena oħra li offriet sfidi minħabba l-COVID 19. Bil-problemi kollha irnexxilna nagħmlu li nistgħu biex preżentajna proġett interessanti dwar il-kwalita' tal-arja madwar l-iskola tagħna, apparti xogħol ieħor. Ftit tax-xhur ilu wkoll bħala kumitat ingħatajna l-LEAF award tax-xogħolijiet li saru tul dawn is-sentejn fejn jidħlu siġar.

Matul ix-xahar ta' Marzu l-iskola tagħna wkoll ħadna aħbar sabiħa fej Benjamin Copperstone student fi ħdan l-Ekoskola ġie magħżul biex ikun GLOBE Vlogger. Minn hawn nawgurawlu biex din l-esperjenza tkun sabiħa u tgħinu fl-apprezzament lejn in-natura u l-klima.

Iż-żmien ta' April wkoll għalina fl-iskola ikun żmien li nsellmu lill-istudenti tal-aħħar sena. Din is-sena wkoll tnejn mill-kumitat li baqgħu sa mill-ewwel sena fl-iskola tagħna temmew l-istudji tagħhom fl-iskola. Ben u Luke nawguralkom għal quddiem u grazzi tax-xogħol li għamiltu fil-kumitat.

F'Mejju kien hemm ukoll kors fejn fih is-Sur Savona ġie magħżul biex jieħu sehem fih ġewwa Ateni. Dan il-kors kien fuq 'Marine litter'. Żgur li din se toffri opportunitajiet ġodda lill-istudenti fejn jidħol dan is-suġġett importanti.

Nħarsu 'l quddiem għas-sena d-dieħla b'ottimiżmu. J'Alla lkoll nerġgħu nibdew il-ħidma ta' qabel il-pandemija b'mod normali ħalli nassiguraw esperjenza sabiħa li tħalli l-frott f'ġieħ l-ambjent ta' madwarna.

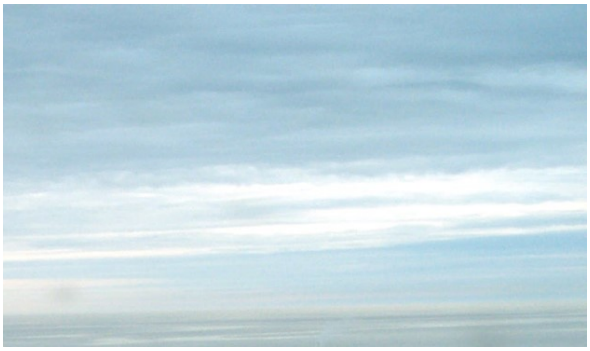
CLOUDS

Benjamin Copperstone / Scott Tabone

Altocumulus clouds
(Dahar il-fekruna)

Altocumulus clouds are seen with weather which is stable and will appear white or grey in colour . It comes from the latin words Altum meaning height and Cumulus meaning heap / pile these clouds are better known as cloudlets. One of the distinct features of this cloud are Coronae which are coloured rings around the sun or moon when viewed from below the cloud. These clouds are made up of droplets of water and are 2,000 to 6,000 m above ground . An interesting fact is that if there are these clouds on a warm and humid summer morning the possibility is that there will be thunder storms later on that day!

The Altostratus Clouds
(Ċluni)



Altostratus clouds are mid-level clouds, ranging in heights from 7000 to 20,000 feet. They look like a thin layer of white sheets which can cover almost the whole sky at times and the sun can be seen through them since they are very thin.

These clouds are composed of both water droplets and ice crystals and are formed when a layer of cirrostratus clouds descend from their usual level. Altostratus clouds often form when in spring and autumn when the temperatures drastically change. This means when these clouds appear there will usually be a change in weather such as rain. Occasionally these clouds can produce small amounts of rain or snow but if they produce substantial amounts of rain, they will turn into nimbostratus clouds. These clouds are featureless for the most part and so mean they are not classified into species like some other cloud types.

Cirrus Clouds
(Sħab tar-Riħ)

Cirrus clouds are high level clouds, with heights ranging from 20,000-40,000 feet. Cirrus clouds are short, detached clouds which look like wispy tufts of hair. In the daytime they are the whitest type of cloud in the sky and at sunset they turn bright orange. These clouds form when warm dry air meets cold air, which forms water vapor. All the water vapor then freezes into ice crystals, which is why these clouds are whiter and wispier than most other types of clouds. Cirrus clouds often form before there is a change in weather, particularly during autumn. These clouds don’t precipitate, but if rain does fall out of them it means they have turned into cirrostratus clouds. Cirrus clouds are classified into 5 species: Cirrus fibratus, Cirrus uncinus, Cirrus spissatus, Cirrus floccus and Cirrus castellanus.

Cirrostratus Clouds
(Ċlampu)

Cirrostratus clouds are high level and layered clouds, ranging in height from 20,000-40,000 feet. Cirrostratus clouds are transparent clouds, which cover large areas of the sky. Sometimes they produce white or colored rings around the sun or moon (the halo phenomena) which can sometimes be the only indication of these clouds since they are so thin. These clouds which can span for thousands of miles can be both smooth and fibrous, and depending on the thickness, they can cast a shadow. Cirrostratus clouds are formed when warm air mixes with cold air, which then turns into water vapor and freezes to ice crystals. This water vapor can also form through contrails when the warm moist air mixes with the cold dry air in the upper troposphere. Cirrostratus clouds don't precipitate, but they can be signs of stormy and windy weather. These clouds can be used to predict what the weather will be like in the next 24 hours. Cirrostratus clouds are categorized into two species: Cirrostratus fibratus and Cirrostratus nebulosus

MARINE LITTER ERASMUS COURSE

A Marine litter course was held between 1st May and 7th May in Athens, Greece. I (Joseph Savona) attended for this course about Marine litter and Eu Directive on Single Use Plastic. This course used marine litter to widen knowledge on ESD (Education for Sustainable Development) and SDG's (Sustainable Development Goal). On Sunday 1st May the participants met in the MIO-ECSDE premises where the detailed programme was presented, and an ice breaker was held. MIO-ECSDE is a non -profit federation working in the field of environment in the Mediterranean.

On Monday there was a lecture on ESD held by Professor M. Scoullos (Chairman of MIO-ECSDE). Following there where different workshops on marine litter, ideas how to use games on marine litter and a lecture how to design a beach monitoring and clean up. The day was over after another lecture on EU directive on Single Use Plastics.

Tuesday consisted of various study visits. Departed to Piraeus where the group visited BlueCycle. BlueCycle is a factory in which they collect plastic especially from fishing nets and they re-use it to manufacture plastic furniture. The group then departed to Lavrion where after visited the CEE centre, an observation fieldwork was conducted on Passah Beach. On way back we visited the Temple of Poseidon at Sounion.

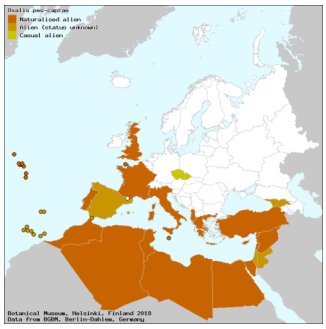
Wednesday was a hands-on workshop. Two workshops were held on how to make effective use from old magazines and another one by using tyres and e-waste to make keychains and necklaces. Thursday was the day in which the actual beach clean-up was held by the group. The group moved to Piraeus and by a ferry boat, went to Aegina Island. The beach clean-up was held with students from Aegina and volunteers. Then there was free time to visit this beautiful island.

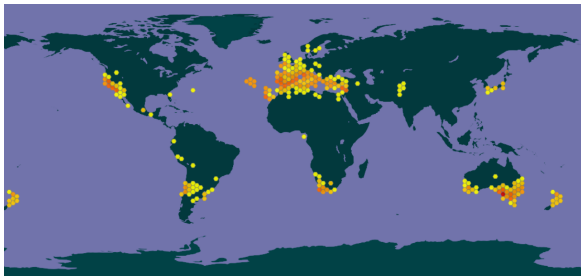
Friday was last day of the course where a remarkably interesting workshop on sea turtles was done. Interesting videos and activities were mentioned on the importance of sea turtles and threats they suffer by marine litter. After this lecture, the group prepared an activity to be held among schools participating. Certificates were given to participants by Professor Scoullos.

Saturday the group had the opportunity to visit Athens and later departed to Malta. This course surely will help the educators to focus deeper on marine litter. This for sure will be another area to work as an Eco-school committee in St. Michael School. Thanks for Ekoskola Malta for this opportunity.

ALIEN SPECIES

(EN) *Cape Sorrel*
(MT) Qarsu / Ħaxixa Ingliża
(SN) *Oxalis pes-caprea*





Introduced in the Balaeric Islands, Britain (excl. Northern Ireland and Channel islands), Corse, Crete, France (incl. Monaco and Channel Islands but excluding Corse), Greece, Spain (incl. Andorra but excl. the Balaerics), Italy (excl. Sicily and Sardignia), Portugal, Sardinia, Sicily and/or Malta.

Sparsely pubescent, caespitose perennial, with a deeply-buried bulb, which emits an annual, ascending, subterranean stem bearing bulbils and a rosette of leaves at soil level. Petioles up to 20 cm; leaflets 8-20 x 12-30 mm, obcordate, deeply emarginate. Flowers infundibuliform (sometimes flore pleno), in umbellate cymes; petals 20-25 mm, yellow. Capsule short, rarely formed. The flowering time is around December til April.

Today is very common and found in waysides, rubble walls, fields and valleys. Species that was introduced in Malta any time after year 1492 (Columbus' discovery of the New World), and spreads rapidly to form large invasive populations to the detriment of native flora or ecosystems.

Source: www.maltawildplants.com

GLOBE Investigation

St.Michael School 2021-2022

An investigative study on air quality at St.Michael School

Introduction

The aim of this study was to find the amount of NO_2 gases present in the air around the school and how this changed since its reading was last recorded (12 years ago). The observation and monitoring period was between October 2021 and November 2021 and readings were taken from 3 different sites around the school. Nitrogen dioxide (NO_2) gas is an increasing problem for air quality all over the world. The gas can cause serious problems such as lung damage, acid smog or rain. As little as 50 ppb can cause airway inflammation in lungs. NO_2 primarily gets in the air from the burning of fuel. NO_2 forms from emissions from cars, trucks and buses, power plants, and off-road equipment. Our school is situated in a busy and urbanized area. Previous study of 12 years ago also noted a high level of NO2.

This study was done to increase awareness on the large number of harmful gases which are found near the school's premises. It was also carried out to show that climate change is upon us, and action must be taken to reduce the presence of these gases. Additionally, readings for other factors, of which weather parameters, were also measured and reported. A barometer was used to measure the air pressure, a thermometer was used to measure the temperature and a measuring cylinder was used to measure the amount of rainfall. The wind direction was also recorded as it could have had an impact on the results.

When the readings for the NO_2 gases were taken, these were sent to a lab in the UK. The results indicated that there has been a significant increase in pollution which is quite worrying.

Between the years 1990-2011 the amount of NO2 gases found in the air, in Malta, increased by 4% and most of the other European countries managed to decrease their NO2 by a large percentage. (EEA 2018) This statistic shows that Malta needs to work much harder in this sector for us Maltese to live a healthy life without much respiratory problems. Limit values have been set in the EU to protect the population; for nitrogen dioxide, an annual average value of 40 µg/m³.

Research Methods

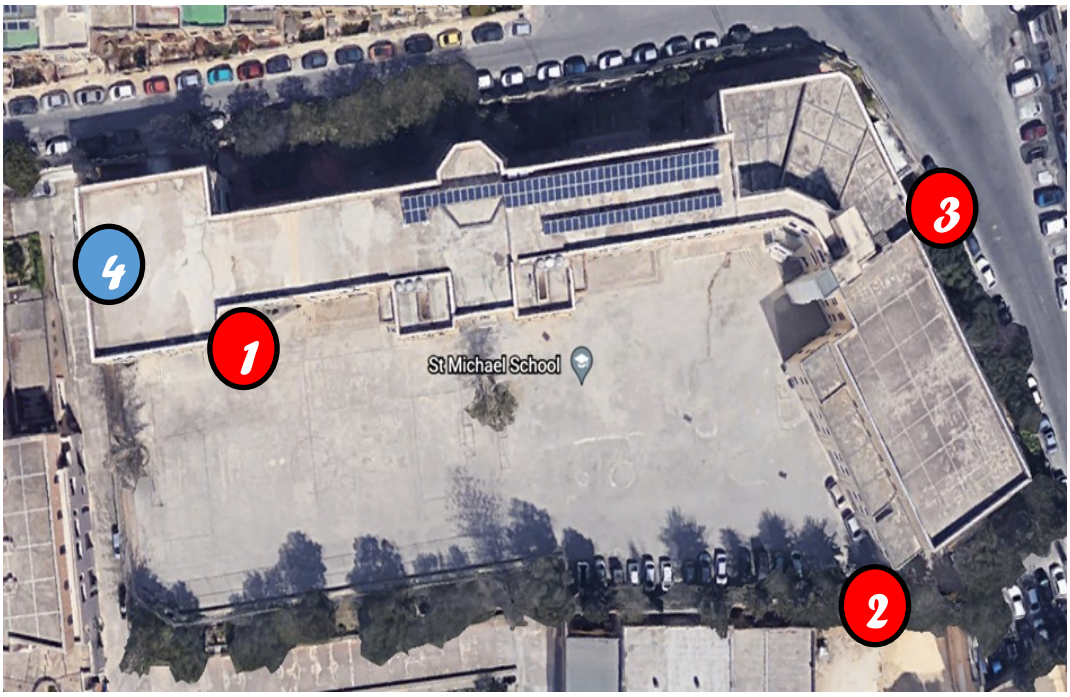
Study site:

Our school is physically set in an urban environment, in close proximity to two separate industrial areas and a main traffic artery which is laden with heavy traffic during most times of the day.

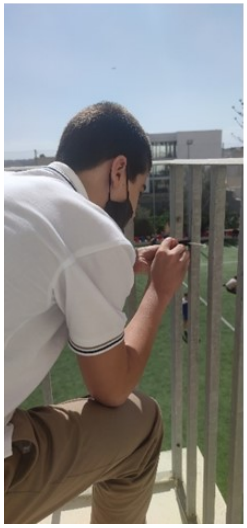
The students identified 4 study sites around the school. The school has been supplied with 3 diffusion tubes from Gradko Laboratories in the UK and these have been put up in 3 strategic areas with differenti levels of exposure to NO2; high, medium and low. The selected areas were;

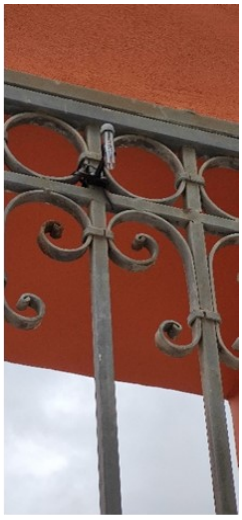
Infront of school (Roadside) (3),
In the balcony (facing the school ground) (1),
Entrance to underground parking (2).

Weather parameters; cloud cover and sky conditions, air temperature, surface temperature, rainfall and humidty were measured from the school roof (4).



Methodology:





<u>Apparatus used:</u>

Data loggers to measure air temperature, humidity and air pressure and sound level

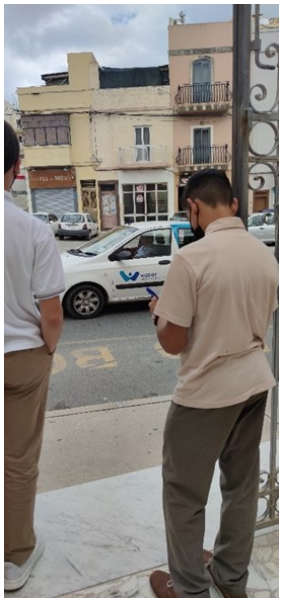
Rain Gauge

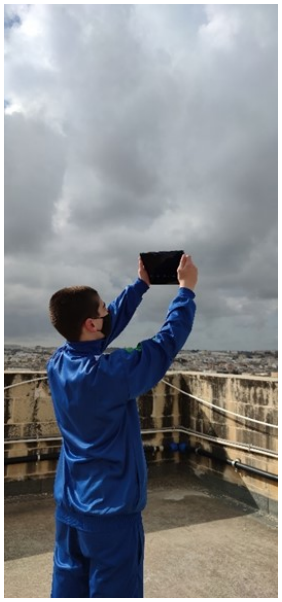
GLOBE Observer App to record cloud type and cover

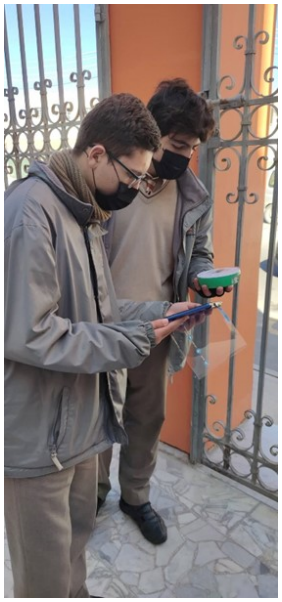
3 Diffusion tubes

Stopwatch

Every day the students took rainfall readings together with the air temperature, humidity and air pressure. They also observed the cloud cover using the GLOBE Observer App and described the general outlook of the weather and surface conditions following the steps of the GLOBE Protocols (GLOBE, 2014). Also using another datalogger they measured sound level in front of school and behind the trees. During the same observation period the student carried a traffic count in front of the school using a stopwatch for 5 minutes.

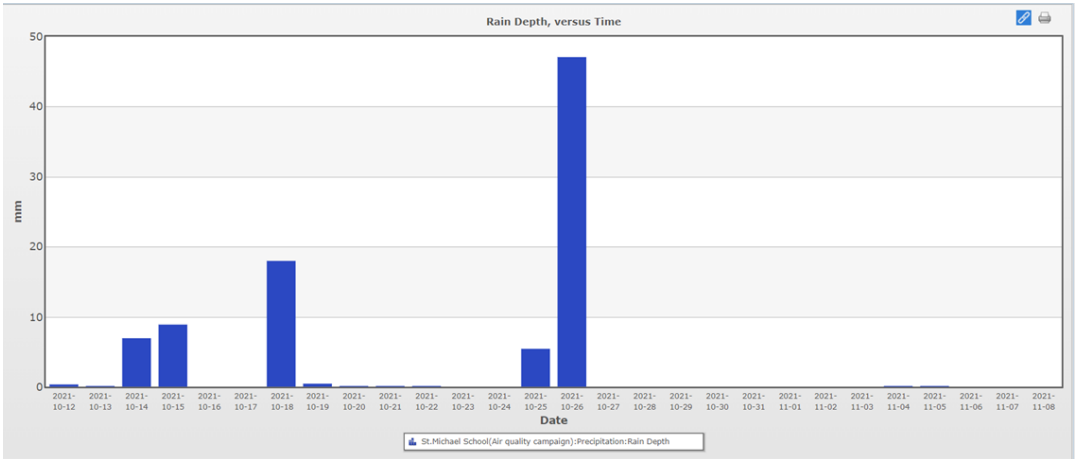






Three diffusion tubes, which measure the NO_2 gas, were put up in different sites around the school. The tube were numbered and marked with a special code provided by the laboratory. The students discussed the best sites were to put the tubes and when the sites were identified these were put in place. Tube 1 was placed in the school ground, Tube 2 in the car park, and Tube 3 in front of the school entrance which is adjacent to the main road and which is also a drop off area.

The project was carried out in collaboration with another school in Gozo, sister island to Malta and two schools from Ireland as part of the GLOBE Ireland Air Quality Campaign which ran from the 12th of October 2021 till the 9th of November 2021. The readings of the car count were taken in the morning and in the afternoon. On the 9th of November the tubes were sent to Gradko Laboratory in the UK for analysis together with those of Gozo. Readings of humidity, rain, pressure, and cloud observations were taken around noon during mid-day break. Sound level was taken in the morning.



Data Analysis

All data collected (Air Temperature, Barometric Pressure, Humidity, Rainfall, Wind, Visibility, Car count and Sound levels) was recorded on a template and uploaded on GLOBE database through the Data Entry tool on the GLOBE Observer App. The 3 diffusion tubes were sent abroad for analysis and results received by email after one week. Data collected was compared with a previous study which was carried out 12 years ago at our school which again focused on air quality.

Results

Students collected daily readings of air temperature, barometric pressure, humidity, rainfall and cloud cover and type together with surface conditions following GLOBE Protocols guide.

Date	Time	Cloud type			Air Temperature (°C)	Pressure (mb)	Humidity (%)
		High	Mid	Low			
12-Oct	11.55		✓	✓	23.7	1009.5	50.9
13-Oct	11.51		✓	✓	24.2	1007.1	61.5
14-Oct	12.35			✓	21.2	1004	58.8
15-Oct	12.33			✓	20.2	1007.3	39.8
18-Oct	12.48			✓	22.8	1016	64.5
19-Oct	12			✓	25.6	1021.2	56.5
20-Oct	11.5			✓	24.3	1023.2	54.6
21-Oct	13.54			✓	25.2	1016.4	53.4
22-Oct	12.35		✓	✓	25.8	1013.6	67.4
25-Oct	12.35	✓	✓		25.8	1007.3	57.4
26-Oct	11.55		✓	✓	26	1010.8	67.44
28-Oct	12.39				20.7	1009.6	73.44
29-Oct	12.38		✓	✓	19.1	1005.6	77.1
02-Nov	8.05		✓		22.3	1006.8	71.6
04-Nov	12.5	✓			25.7	1003.6	64.1
05-Nov	12.43	✓	✓	✓	25.2	1006.1	74
08-Nov	12.37	✓	✓		24.5	1005	78.9

Date	Time	Rainfall		Wind			Visibility		
		Yes	No	Strong	Light	Calm	Good	Fair	Poor
12-Oct	11.55		✓	✓				✓	
13-Oct	11.51		✓			✓		✓	
14-Oct	12.35	✓		✓				✓	
15-Oct	12.33		✓	✓			✓		
18-Oct	12.48	✓				✓	✓		
19-Oct	12		✓		✓			✓	
20-Oct	11.5		✓		✓			✓	
21-Oct	13.54		✓	✓				✓	
22-Oct	12.35		✓	✓					✓
25-Oct	12.35	✓				✓		✓	
26-Oct	11.55		✓	✓				✓	
28-Oct	12.39	✓		✓				✓	
29-Oct	12.38	✓				✓		✓	
02-Nov	8.05		✓			✓	✓		
04-Nov	12.5		✓	✓					✓
05-Nov	12.43		✓			✓			✓
08-Nov	12.37	✓				✓			✓

Date	Direction	Speed (km/h)	Gust (km/h)
9/11/2021	SSE	16.2	35.2
8/11/2021	SSE	22.2	46.3
7/11/2021	SE	23.9	48.2
6/11/2021	NE	9.7	37.1
5/11/2021	S	16.9	38.9
4/11/2021	S	21.1	48.2
3/11/2021	WNW	16.7	44.5
2/11/2021	WSW	15.3	50
1/11/2021	SE	8.6	29.7
31/10/2021	NNW	16.1	42.6
30/10/2021	NW	30.6	61.2
29/10/2021	NNE	30.6	64.9
28/10/2021	ENE	24.8	53.7
27/10/2021	NNE	22	48.2
26/10/2021	E	15.8	46.3
25/10/2021	SW	15.3	46.3
24/10/2021	ESE	20.2	40.8
23/10/2021	SSE	18.1	35.2
22/10/2021	S	11.4	33.4
21/10/2021	E	8.8	25.9
20/10/2021	E	13	31.5
19/10/2021	NE	5.6	33.4
18/10/2021	W	6.7	22.2
17/10/2021	WNW	16.4	42.6
16/10/2021	NW	30.8	59.3
15/10/2021	N	21.1	53.7
14/10/2021	WSW	8.8	29.7
13/10/2021	NW	15.5	44.5
12/10/2021	NW	19	40.8
11/10/2021	WNW	17.1	38.9

Wind direction

Date	Morning (7.00-7.05)	Afternoon (12.00-12.05)
12-Oct	169 to standstill	160
13-Oct	/	/
14-Oct	150	85
15-Oct	60 to slow moving	Very slow moving
18-Oct	93	70
19-Oct	75	112
20-Oct	90	46
21-Oct	140	96
22-Oct	80	90
25-Oct	102	52
26-Oct	Very slow moving	105
28-Oct	102	62
29-Oct	113	74
02-Nov	/	/
04-Nov	145	80
05-Nov	135	75
08-Nov	142	67

Car count

Sound level

	Road Side	Behind Trees
Sound level (dB)	72	58.9

NO_2 levels

Location / School	Period	Time (hr)	µg/m³	ppb	µg NO_2 on tube
Main Entrance School (Gozo school)	12/10/2021-09/11/2021	669.87	19.02	9.93	0.93
Entrance to Parking (Gozo school)	12/10/2021-09/11/2021	669.88	20.56	10.73	1
Ground Area (Gozo school)	12/10/2021-09/11/2021	669.75	12.78	6.67	0.62
Road Side (Malta school)	12/10/2021-09/11/2021	669	37.06	19.34	1.80
Entrance to Parking (Malta school)	12/10/2021-09/11/2021	669.45	22.61	11.80	1.10
Ground Area (Malta school)	12/10/2021-09/11/2021	669.60	22.4	11.71	1.09

School Name	Location of Tube 1	µg/m³	Location of Tube 2	µg/m³	Location of Tube 3	µg/m³
Kishoge Community College	Sheltered	17.71	Near_Main_Rd	20.46	Car_Park	23.74
Ramsgrange Community School	Near_Main_Rd	missing	Car_Park	3.89	Sheltered	9.85

Discussion

The results obtained where discussed between all schools involved on Zoom plaform. Unfortunently, as expected, our school recorded the highest level Nitrogen Dioxide among all schools in all the 3 study sites. With the data collected, we did a comparative study with a similar study carried of 12 years ago. Results were quiet alarming too.

When analysing the data collected during the traffic count, we can confirm that our school is situated in one of the busiest roads in Malta, sandwiched between two industrial estates. Mornings are busier than mid-day, getting busier again in the late afternoons, even if the latter was not monitored. At some point, traffic came to a standstill. Another fact to be noted is that in the morning the majoirty of traffic direction is heading to Birkirkara which goes up hill therefore more acceleration needed and hence higher emissions.

High humidty levels are beneficial for NO_2 absorption. One has to note that overall the humidty levels where low and constant. This could also led to a higher level of NO_2 levels. During the study we had a most of the days with strong wind, the wind blew mostly from (NE, E, SE) which confirms the higher NO_2 levels for the Road side as tube was installed in the main gate of school. Also noting there is the fuel station opposite to the school. (Figure 12)

It is scientifically proven that as altitude increases, the amount of gas molecules in the air decreases. Our school is located just above the valley of Qormi. In fact few metres away there is the valley. Elevation of school is just 46m (Figure 11). This may also be an indicative fact about our high level of Nitrogen Dioxide compared to the other schools with a higher elevation than us.

Our three tubes when evaualting the NO_2 levels confirm that the highest level was the area of the road side which apart from a busy road is also a drop off area for vans and parents infront the entrance of the school. Then the entrance to the parking had second highest level and least the tube facing the school ground. When comparing to another school in the Maltese islands (Gozo) confirms that we live in a queite polluted area, mostly because our school is situated in a main road. The results where by means the highest when compared also with our collaborating schools in Ireland.

Our school in year 2020 carried also a globe study using GLOBE Tree Mapping. This time we used the trees to test if they act as a sound barrier. When we carried out a simple test using the data logger we confirmed that trees act as a sound barrier and the trees surrounding the school especially alongside the main road are beside acting as a 'air filter' , they are helping in reducing the sound levels caused by vehicles.

This study was carried out by a group of students back in 2010. We calculated our weekly average based on hours of study. The tube facing the main road was 9.3 $\mu g/m^3$. When comparing the tube at the same sight on 2010 , the weekly average of Nitrogen Dioxide was 8.2 $\mu g/m^3$. When calculating the percentage increase in the same area we found out that there was a significant increase of 13.4146%. One factor for this increase in NO_2 level is for sure the population growth in these 12 years, which demand more vehicles in the streets leading to more emmission. The population of Malta in 2010 was 414,253 that when compared to the present one 2022 is 443,451. This is an increase of 7.04%.

Conclusion

There are multiple reasons as to why the level of NO_2 has increased in the last 12 years. These are some of the reasons:

An increase in population – The Maltese population has escalated in the last 15 years. As a result, more people go to work w
own private car and so, pollution increases. Many cars pass in front of our school every day, on average, 100 cars per 5
during the rush hours which are between 6:45am – 8:30am and between 3:30pm – 5:30pm.

Cars and vans stopping in front of school – Students are taken to school either by van or parents drive students by car. Th
confirmed through a questionaire which was held recently amogst all students. When they arrive at school, the vans and c
their engines on while the children are getting off. Even though this only takes a couple of seconds, this factor may still aff
long run. School staff increased during the years an din turn they use their personal car to come to school. This resulted
emmissions in the parking entrace when compared to the prevoius years. The highest concentration of NO2, 37.6 µg/m3 lev
school entrance, which although within the limits of 40 µg/m3 set by the EU, we still believe that in certain times and day
higher. This as a result of traffic jams and heavy congestions.

Fuel Station – The fact that there is a fuel station exactly in front of the school's main entrance contributes considerably to the high levels of NO2.

Urban area – St. Michael School is located between two industrial estates which apart heavy machinery and traffic leading to them, some of them use fuel to operate which leads to more emissions. Another point to add is that there is a lack of open spaces/trees in the surrounding area.

Following this study we are committed to do our part at reducing the levels of NO2 within the school area. To this, the students have proposed the following actions with the head of school:

car-pooling between students or workmates
turning off car engines when dropping off students to school
planting more trees.

On a national scale, a number of measures that could be taken, which give more alternative travel options, to improve air quality might include;

the redesign of local roads to improve traffic flow and reduce idling traffic;
the creation of park and ride services;
the promotion of infrastructure for electric vehicles;
and infrastructure improvements for cycling and walking.

An interesting fact found is that during the pandemic Malta's activity was slowed down and also traffic. An assessment done in 2020 by ERA (a govermental organization on environment) found out that NO_2 levels in Malta where 50% less than usual. This is a confirmation that traffic generates NO_2 emmissions.

Recommedations

Weather conditions were fairly constant througout the study, being mostly sunny with no rain. It would be ideal that similar studies are done in different time of the year for varible weather.

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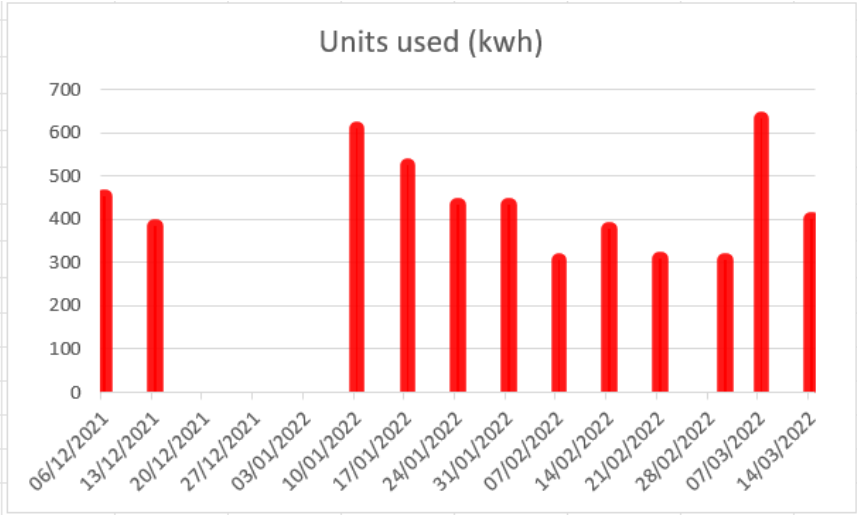
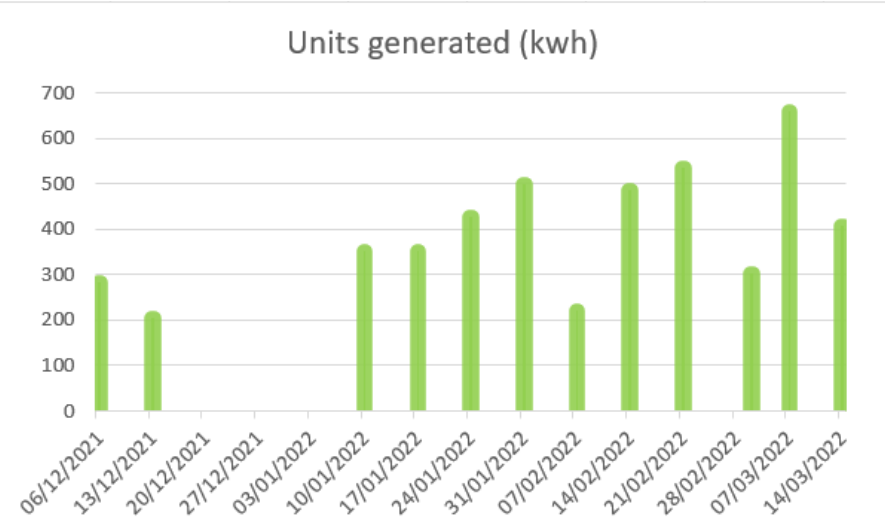
READINGS



06/12/2021	454
13/12/2021	385
10/01/2022	612
17/01/2022	526.26
24/01/2022	435
31/01/2022	434.9
07/02/2022	305
14/02/2022	380
21/02/2022	308
02/03/2022	307
07/03/2022	633
14/03/2022	402



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13/12/2021	204
10/01/2022	351
17/01/2022	352
24/01/2022	427
31/01/2022	500
07/02/2022	222
14/02/2022	487
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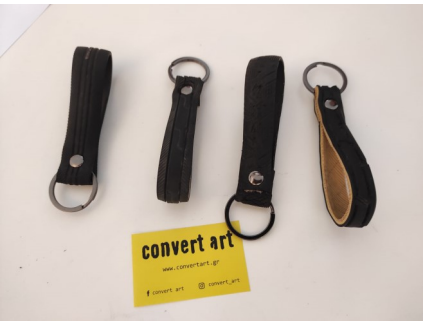
02/03/2022	304
07/03/2022	659
14/03/2022	409

RITRATTI

LEAF award



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