Citizen Science @ Rockford Manor Secondary School

Rainfall Monitoring Project

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Introduction

- *TY Citizen Science Project (January 9th-24th)*
- *Rain Gauge from Globe Ireland (Thanks!) – set up in an open location*
- *Measuring the amount of rainfall in our school*
- *Coming up with ideas on how to make our school more environmentally sustainable and more resilient to rainfall*

SLOW THE FLOW!

11 SUSTAINABLE CITIES AND COMMUNITIES

THE GLOBE PROGRAM

Our School

Rockford Manor is a Presentation school located 1.5 km from the sea on Stradbrook Road, Blackrock, Co. Dublin. Our school is located next to a busy road on a roundabout.

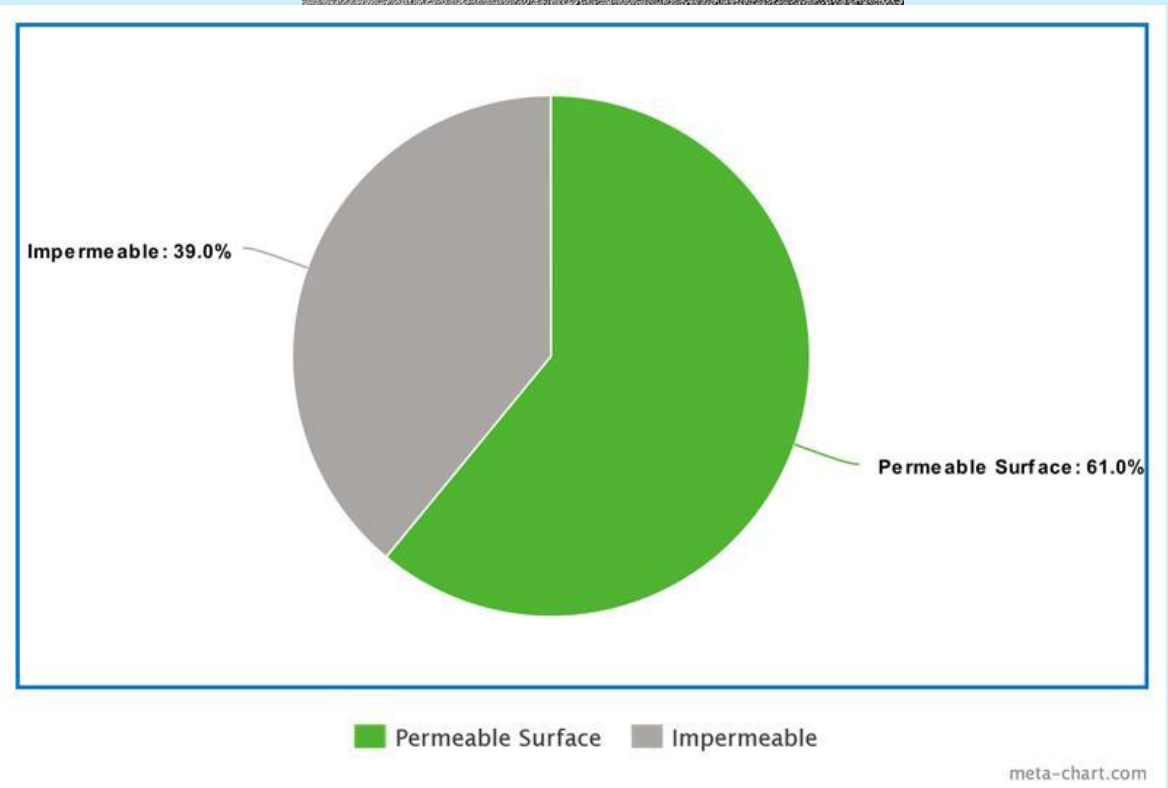
What Are We Doing?

1. *Mapping our school grounds and assessing the permeability of all surfaces.*
2. *Measuring rainfall and pH everyday for 2 weeks.*
3. *Assessing the risk of flooding.*
4. *Developing nature-based sustainable water drainage solutions.*


Rainfall & Flooding Observation Chart
THE GLOBE PROGRAM
Rainfall+ Flooding Monitoring
Project Citizen Science
#GREENSCHOOL WATER FLAG
#SUSTAINABLE LIVING
NATURE-BASED SUSTAINABLE URBAN DRAINAGE SOLUTIONS
WHAT ARE WE DOING?
Measuring rainfall + pH everyday for 3 weeks.
Mapping our school grounds + assessing the permeability of all surfaces.
Assessing risk of flooding.
Developing Nature-Based Sustainable water drainage Solutions
#WATER

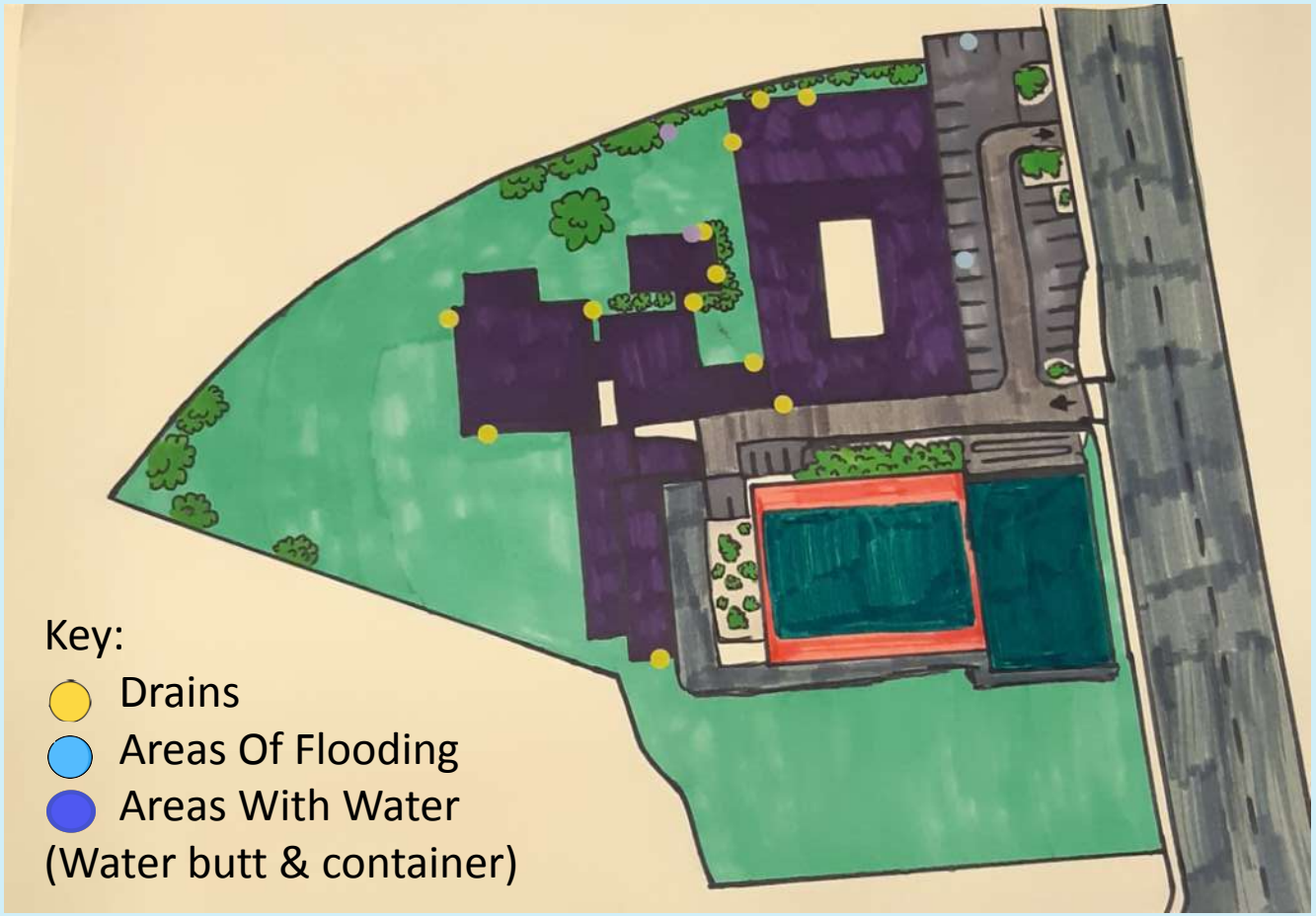
Mapping our School

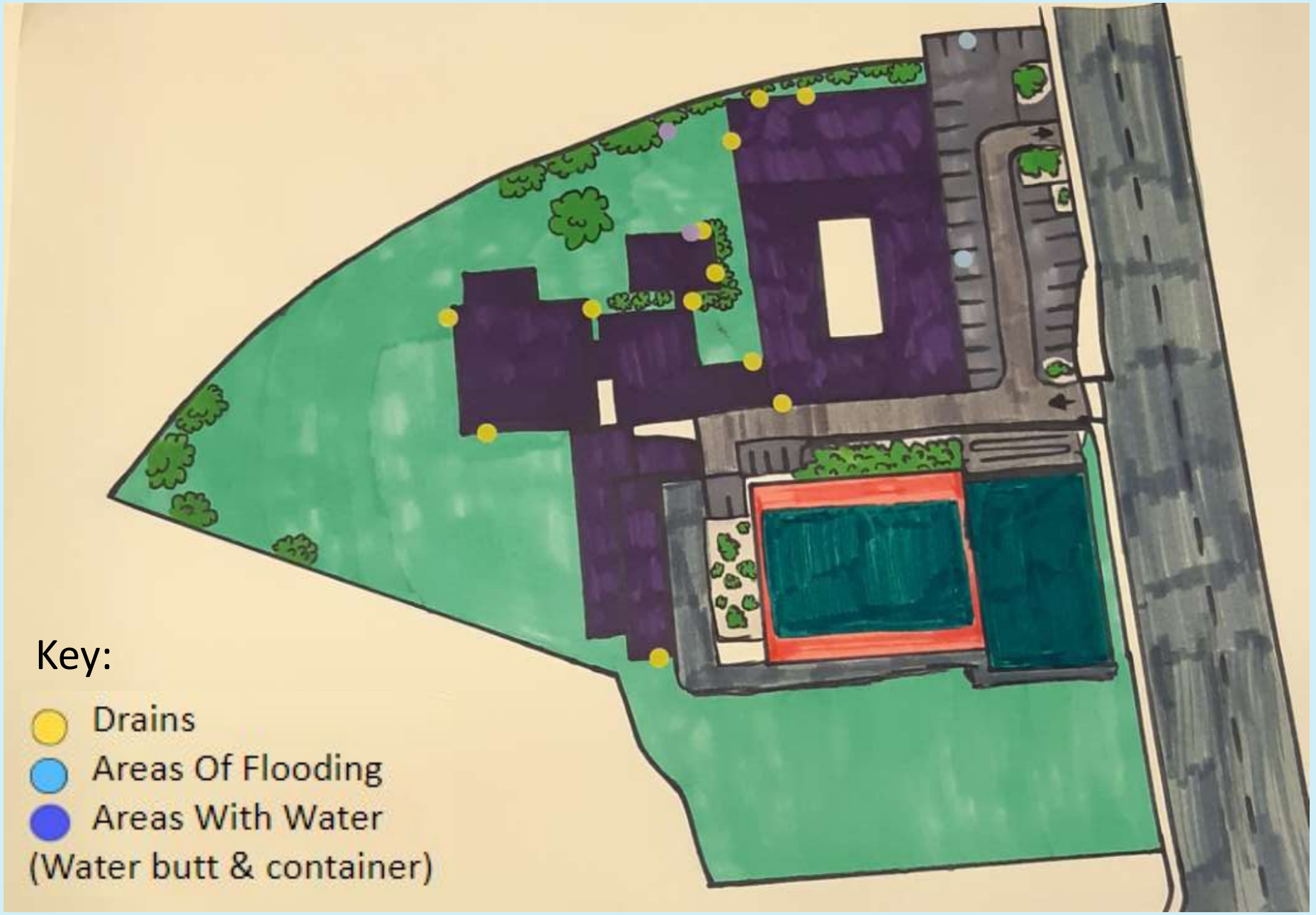
During our research, we went around the school and used a trundle wheel and performed calculations to work out the area of our school.
Total Area: ***12,144m²***



Mapping Our School Grounds & Assessing The Permeability Of All Surfaces

The grass areas around our school are very permeable, while areas such as the carpark and basketball courts that are made from tarmac are not permeable at all.




Key:
Drains
Areas Of Flooding
Areas With Water
(Water butt & container)

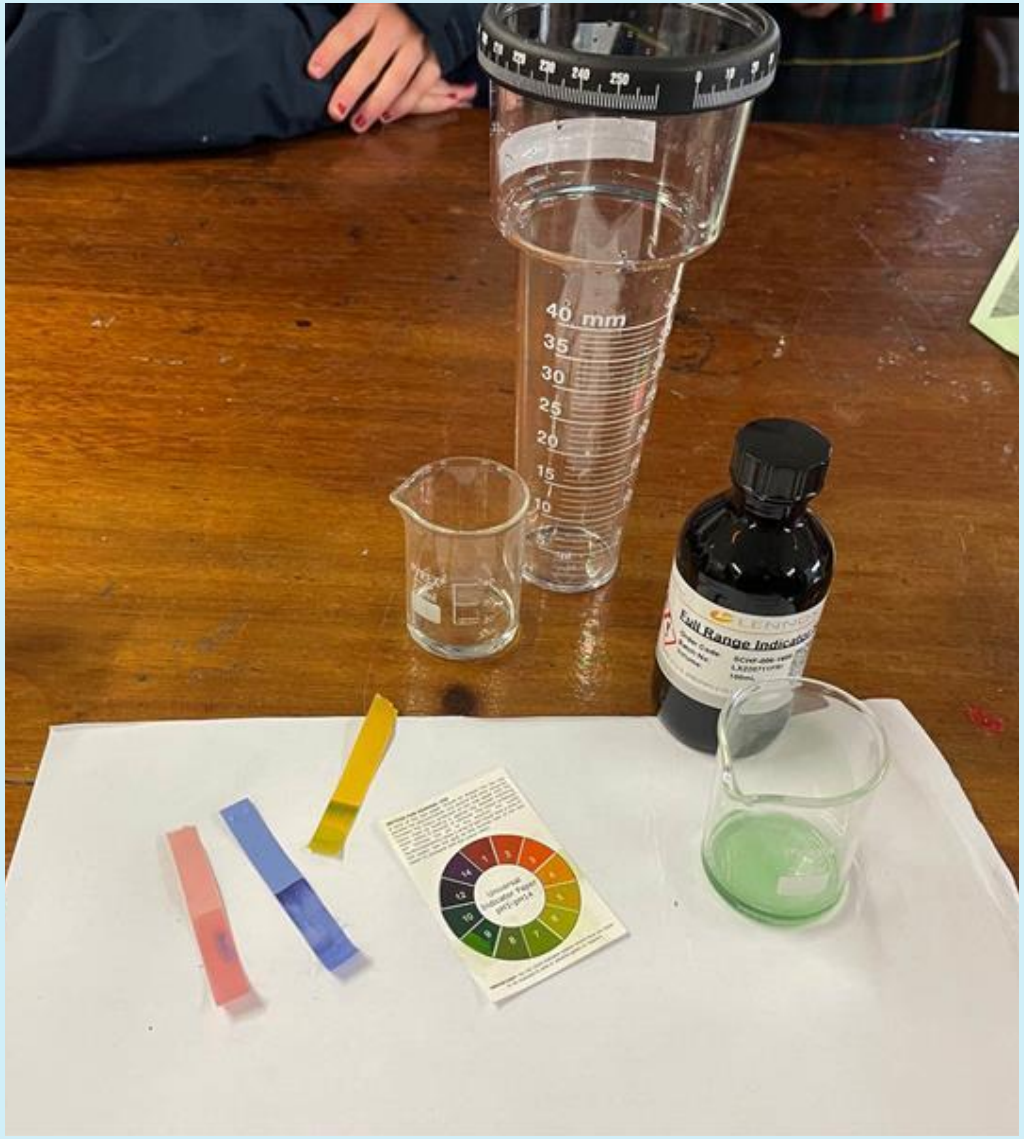
Measuring Rainfall

- *To measure the amount of rainfall we set up a rain gauge from Globe Ireland in a high open area on a pole.*
- *Each day around the same time of the day, we checked the amount rainfall in the rain gauge.*
- *We also recorded the weather conditions*

Testing the pH

- *We brought the samples back to our lab to check the pH levels*

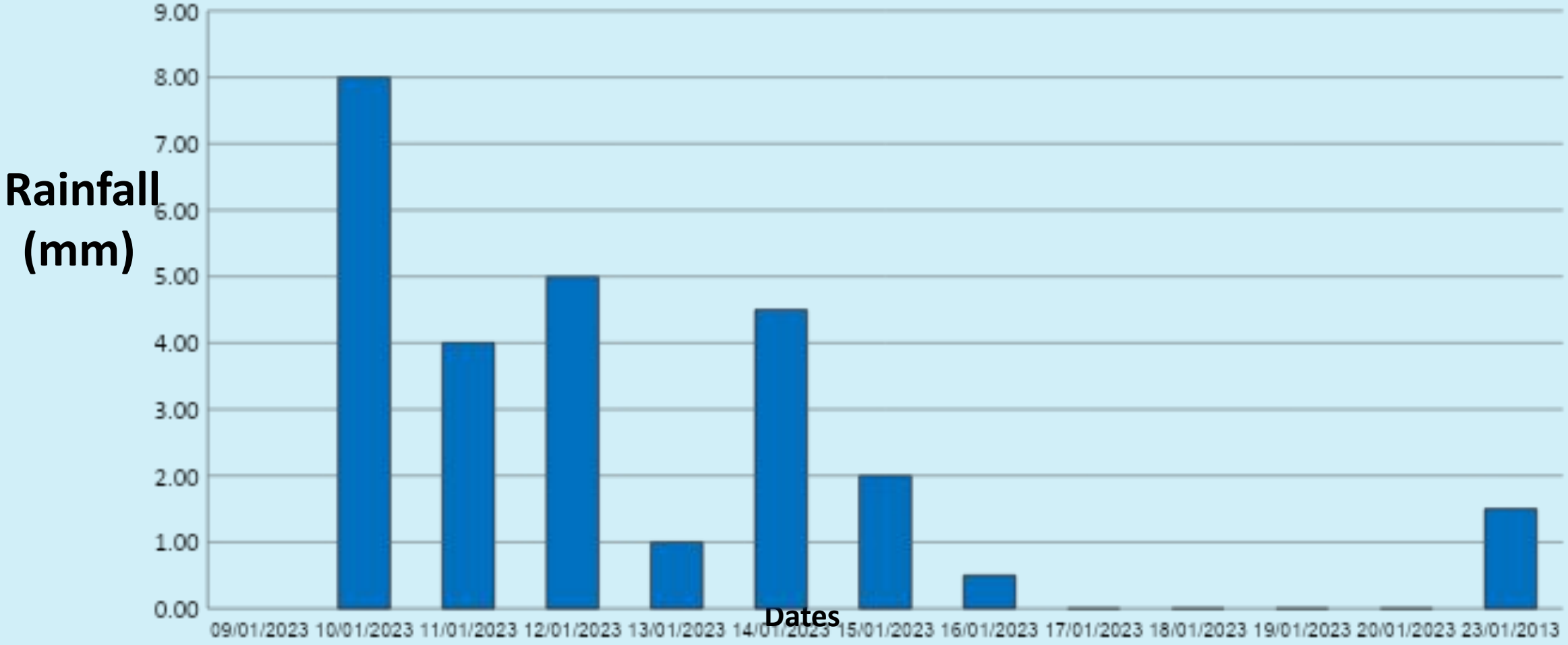
- *The average pH of the rainfall is 6, which means that the rain is slightly acidic.*



Results

Date	Time of recording	Rainfall (mm)	Calculation of L per m3	Puddles / flooding observed on school grounds	Other weather conditions (wind, temperature, cloud cover, weather warnings etc.)	pH Test result
01/09/2023					cloudy, showers, temp 3, west wind 15 km/hr	
10/01/2023	10:50	8.00		yes - carpark space	Wind and heavy rain, temp 13, SE wind variable 25-55 km/hr	
11/01/2023	11:00	4.00		yes - carpark space	Wind and rain, temp 8, west wind, 40 km/hr	6
12/01/2023	10:50	5.00		yes - carpark space	Yellow wind warning , Wind and showers, temp 7, west wind, 60 km/hr	5.5
13/01/2023	13:05	1.00		yes - carpark space	Rain showers and sunny spells, temp 9, wind from west 21 km/hr	5.5
14/01/2023	12:00	4.50		yes - carpark space	Mix of sun and cloudy and few showers, temp 10, Wind SW 12 km/hr	6
15/01/2023	12:30	2.00		yes - carpark space	Mix of Sun and cloud, and odd shower, temp 5, wind from W, 13 km/hr	6
16/01/2023	13:05	0.50		yes - carpark space	Cold, sunny, dry, wind from NW 19 km/hr	6
17/01/2023	11:30	0.00		yes - carpark space - FROZEN	Yellow low temp warning, sunny, dry, temp -1C, W wind 20 km/hr	N/A
18/01/2023	11:10	0.00		Yes - carpark space - small puddle	Sunshine and scattered clouds, temp 4 degrees, W wind 26 km/hr	N/A
19/01/2023	12:30	0.00		Yes - carpark space - small puddle	Clear sky, sun, temp 3, w wind 17 km/hr	N/A
20/01/2023	13:05	0.00		No	Sunshine and scattered clouds, temp 7, wind SE 13 km/hr	N/A
23/01/2013	11:00	1.5		No	Cloudy, dry, temp 12 degrees, wind SE 7 km/hr	6

Rainfall Results



Assessing The Risk Of Flooding

- *After a full day of rain, we went outside around the school grounds to check where the flooding had occurred.*

- *The main areas of flooding were in a few parking spaces in the car park, which made these spaces unusable after there was heavy rain.*

Assessing The Risk Of Flooding

- *Some drains overflow when it rains as they are blocked with leaves*

- *The grass area behind our school gets very soggy underfoot*

Developing Nature-Based Sustainable Water Drainage Solutions – Wishlist!!!!

- ***Planters***
- *Green wall*
- *Copse of native trees – outdoor classroom*
- *More water butts*
- *Green roof*
- ***Pathway around the school made with a permeable material, such as pebbles, stepping stones and raingarden border***

Upcycling

This barrel could be repurposed as a rainfall planter or a micro-pond.

Planters

Rainwater pools on this flat roof surface on rainy days.

A planter could help to slow the flow and prevent water from accumulating on the roof.

Planters around the other drains would be of benefit too.

Air Quality Monitoring

Air quality measurements we have made over the past two years indicate that the air in our green space behind the school is much less polluted than the air towards the front of school near traffic.

Students should hang out in our green space and not in our carpark near the road

Location	Autumn '21	Spring '22	Autumn '22
	Concentration of NO_2 (ppm)		
Front of school, main road	18.29	22.15	18.32
Basketball court	16.12	21.86	13.49
Green space – back of school	13.13	13.30	13.49

Our Future Plans

When it rains, the back of the school, which is mainly grass, gets very wet and mucky, therefore students prefer to stay in the front of the school where there are more dry pathways, but also more nitrogen dioxide pollution.

We would like to add a pebble or gravel pathway around the back of the school. As it's a semi-permeable surface this will prevent puddles and muck, allowing students to use it anytime they want.

Our Future Plans – sustainable walkway with raingarden

Benefits

- *Provide a dry, non-slip walking route around our school*
- *Raingarden will drain excess water from the walkway*
- *Raingarden will improve our school's biodiversity and sustainability*
- *Student health and well-being would improve*

Thank You For Listening!