



# “Empowering Minds through Transformative Learning of PSHS-CLC students with the GLOBE Program Protocols”

Lightning Talk Presentation

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*Asia & Pacific Region Representative, GLOBE Science Working Group*

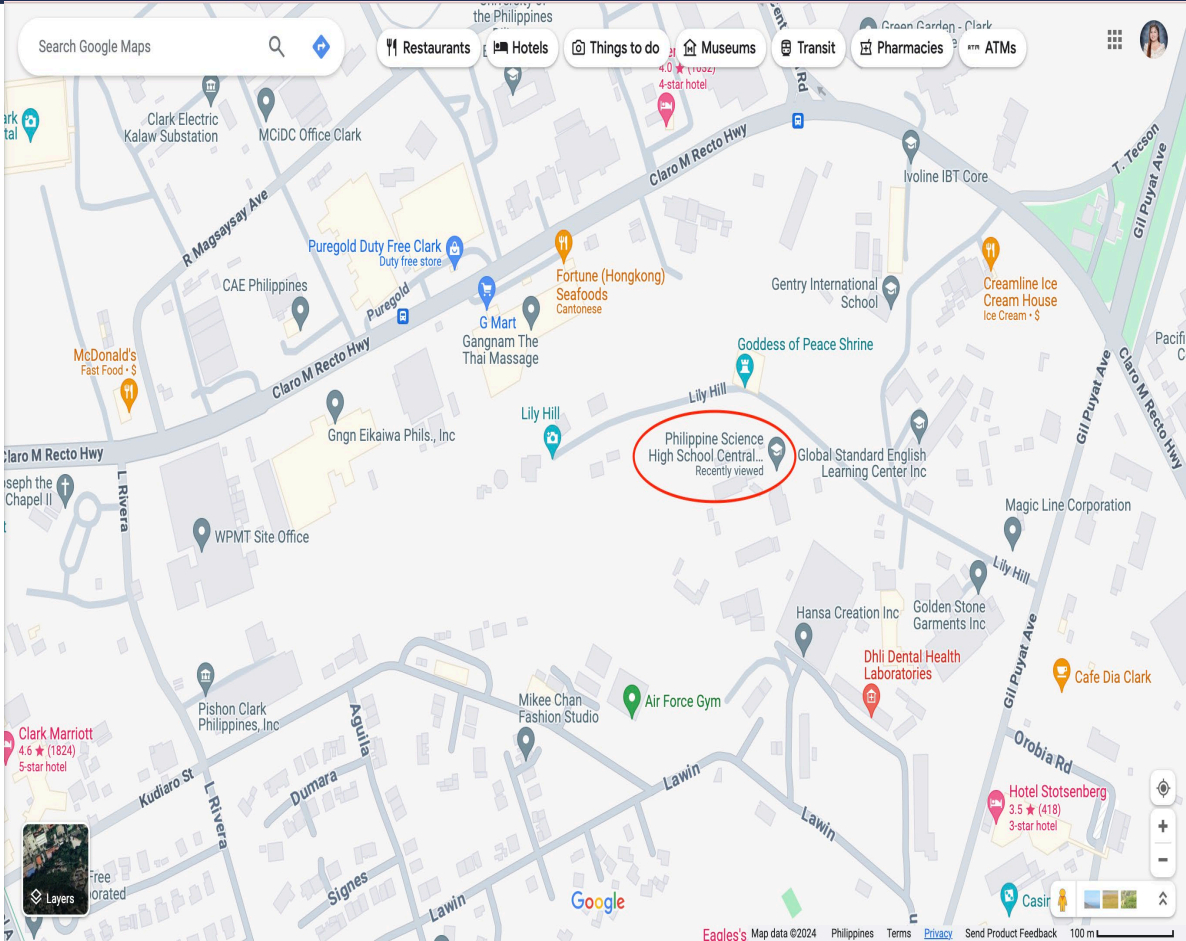






# The GLOBE Program

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## Philippine Science High School – Central Luzon Campus

offers premier STEM education for Grade 7-12 scholars







# PSHS Science Immersion Program (SIP)

**2-week program (80 hours)**

- Provide opportunities in STEM;
- Raise awareness and knowledge about pressing issues; and
- Familiarize with the program and strategies





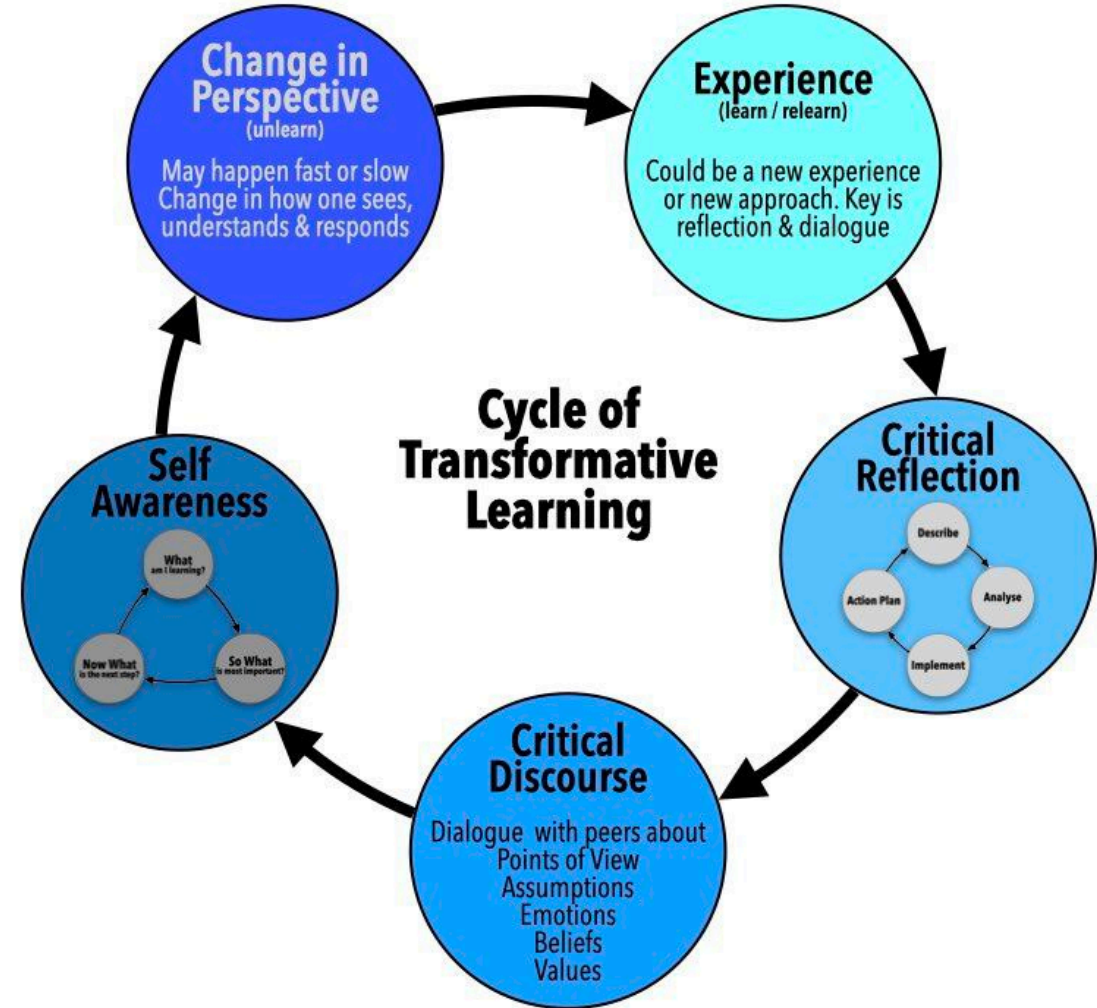


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**2020-2022**

No in-person internship programs  
Difficulty in implementing quality  
immersion program and activities



Aubrey, K., & Riley, A. (2017). Understanding & using challenging educational theories. SAGE.





[Post COVID]

## ***Environmental Observations of the Earth Systems using the GLOBE Program***

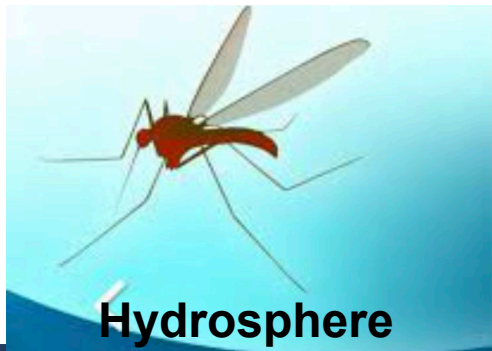
A **Science Immersion Program (SIP)** offered to the Philippine Science High School - Central Luzon Campus students

Program Mentor: **JOSEPHINE JOY TOLENTINO ANTALAN**  
(she/her/hers)

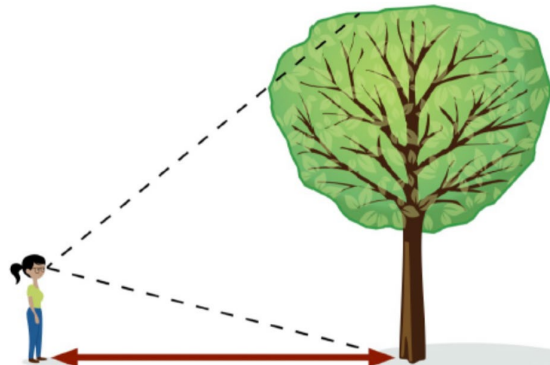
Duration of Internship: **June 13-23, 2023**



**Atmosphere**



**Hydrosphere**



7 to 25 meters / 25 to 75 feet

**Biosphere**



**Pedosphere**







## PROFILE OF STUDENTS ENROLLED

- Three (3) Grade 9 students from PSHS-CLC
- Thirteen (13) Grade 10 students from PSHS-CLC
- Five (5) Grade 11 students from PSHS-CLC



Figure 1A-1D. GLOBE Program orientation inside the classroom as well as discussion of GLOBE Program Protocols, highlighting the significance of doing environmental observations using the GLOBE Program.





# Student Activities using the GLOBE Program during the Science Immersion Program (SIP)







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Fig. 2A-2D. GLOBE students learn and explore the features of the GLOBE Visualization System (Vis) and how this is fundamental to student researches

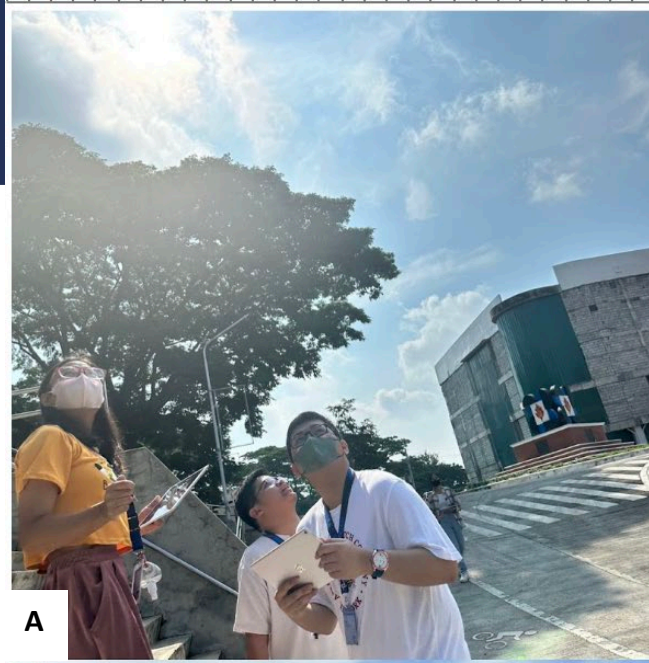
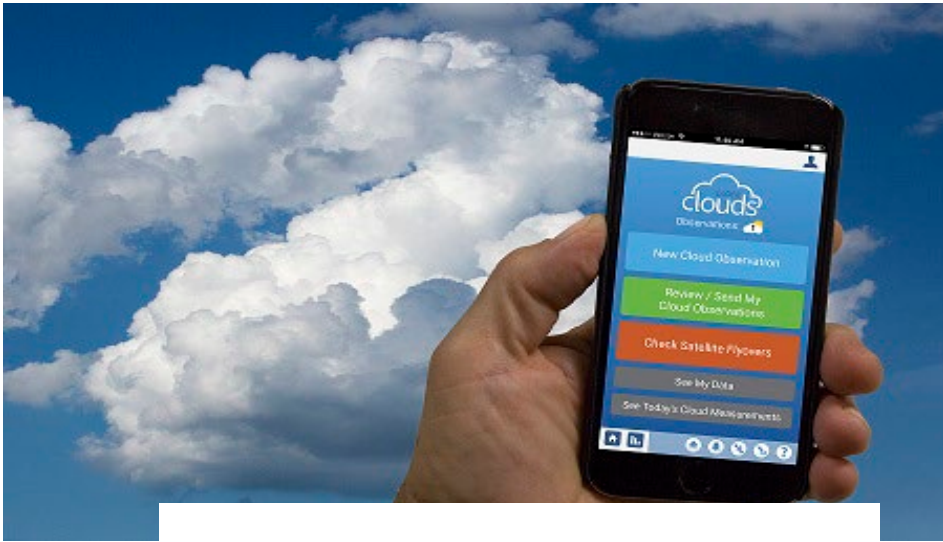


Fig. 3A-3E. Case study analysis using the GLOBE Advanced Data Access Tool (ADAT), where students report their findings and share their learnings in class





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A



B



C



D

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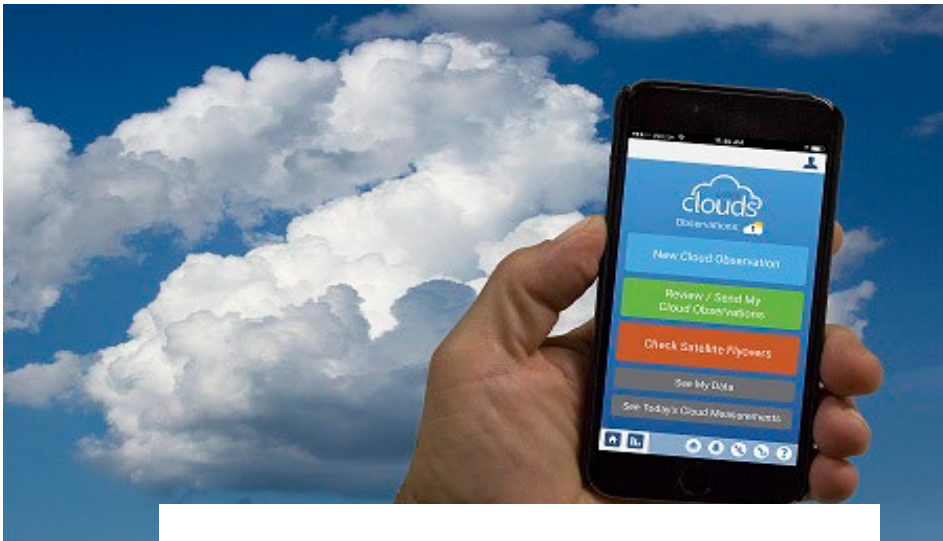


Fig. 4A-D. Students take cloud measurements using the GLOBE Observer app (Clouds) and the printed copy of GLOBE Atmosphere Protocols





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Fig. 5A-F. Students present their cloud observations in class and share their insights on the use of GLOBE Observer app (Clouds)





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Fig. 6A-6G. Students view the collected mosquito larvae using the Clip-on microscope (macro lens) and report their observations using the GLOBE Mosquito Habitat Mapper app.

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# The GLOBE Program

**GLOBE Land Cover**  
Adopt a Pixel

Observations: **28**

Badges Earned:

- Land Cover Observer
- Land Cover Expert
- Satellite Observer

New Land Cover Observation



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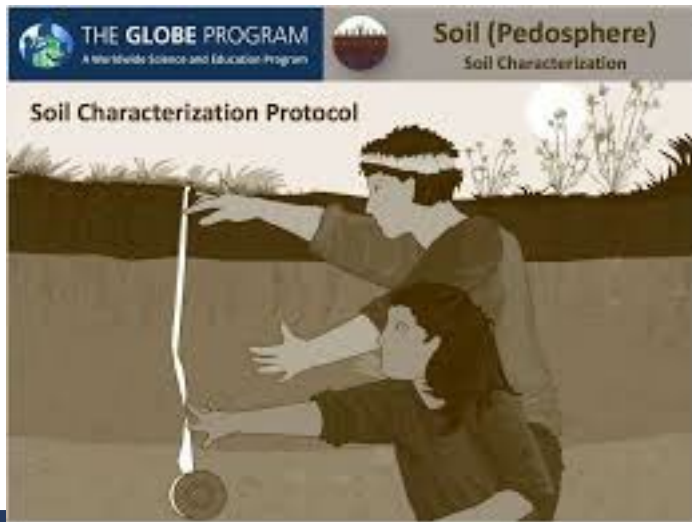


Fig. 7A-7E. Students take Biometry protocols, specifically Land cover and Trees using the GLOBE Observer app and the GLOBE Biometry Protocol





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Fig. 8A-8E. Students investigate soil properties and characteristics using the GLOBE Pedosphere Protocols and report the data collected in GLOBE Data Entry





# The GLOBE Program

## GLOBE SIP Highlights

- total of **249** data observations in the 4 GLOBE Protocols
- **88** data submissions in Atmosphere (Clouds)
- **17** data submissions in Hydrosphere (Mosquito Habitat Mapper)
- **108** data submissions in Biosphere (Land Cover, Biometry Tree, Biometry Tree Heights)
- **36** data submissions in Pedosphere (Vegetation Covers, Soil Characterization)
- **7** case studies presented using ADAT
- **7** scientific papers written about Atmosphere & Biosphere Protocols; and
- **4** scientific paper summary written about Hydrosphere and Pedosphere Protocols



Fig. 9A-9B. GLOBE SIP Most Promising Students and the 21 GLOBE SIP Student-Completers





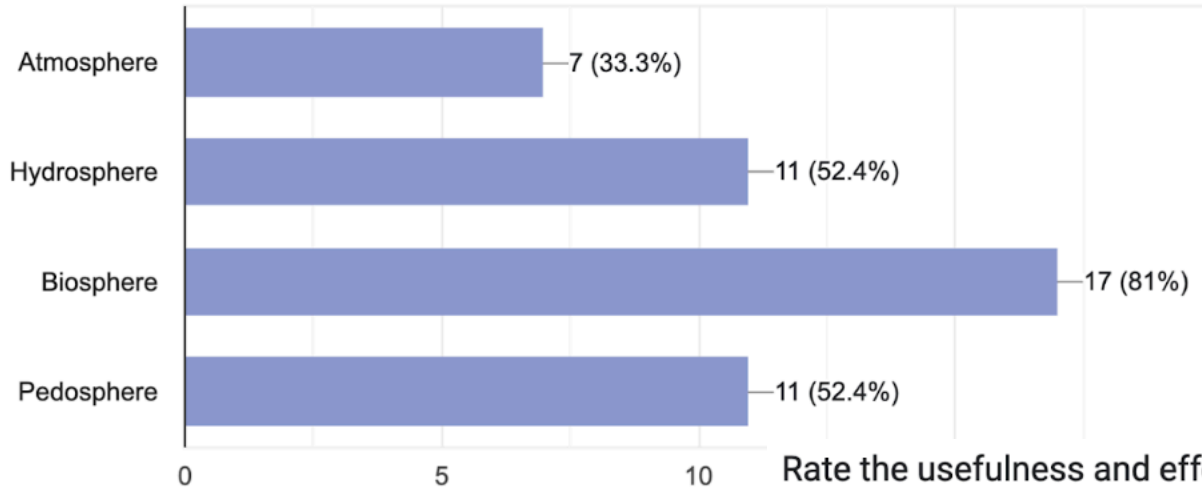
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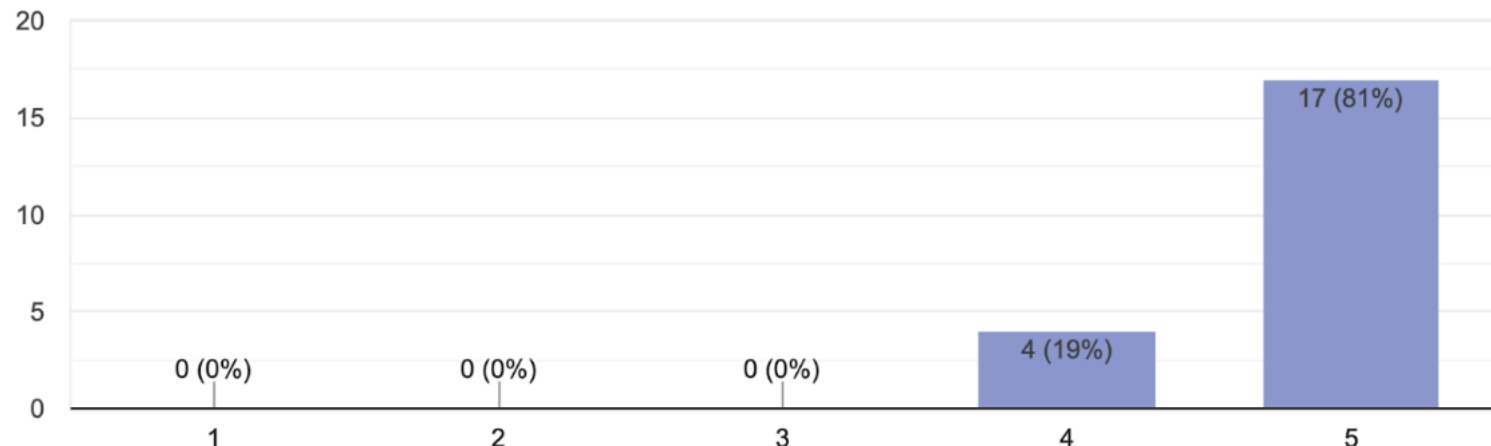
Which protocol would you most probably use in your future research? (Choose at least 2)

21 responses



Rate the usefulness and effectiveness of the course materials (i.e. handouts, slide presentations, etc.) of this program

21 responses







## GLOBE SIP STUDENT

### FEEDBACKS

- *“This was one of the most exciting aspects of my academic life, and I am grateful to say that I have learned so much about not just the GLOBE program, but the scientific process as a whole. I believe that this course has prepared me for my SYP years, and can even go as far as to say that I am prepared for the future beyond.”*
- *“I never expected the GLOBE program to be this fun. I was very nervous as I thought I wouldn't be able to make it - but I did! (hopefully)”*







## GLOBE SIP STUDENT

### FEEDBACKS

- *“I genuinely enjoyed all the hands-on activities which was a shock because before this program I had little to no interest in these types of topics. But after all the discussions and activities, I started enjoying it more and more as the time runs.”*
- *“This course gives a great advantage to students who are greatly passionate about environmental science as they will be provided with access to GLOBE features. I have achieved a lot such as submitting data to the GLOBE Observer App and writing science paper in a short amount of time.”*







## GLOBE SIP STUDENT

### FEEDBACKS

- *“i had so much fun learning about the environment !!! genuinely, i enjoyed this course a lot more than i would have expected to. it was fun conducting the on-field activities, and although accomplishing the science papers for each one was tedious, it was satisfying to be able to write down paragraphs of information on our findings. i truly learned a lot :>>”*
- *“I have achieved brand new knowledge regarding different protocols and how they affect environmental conditions. For that, I am grateful for the program.”*







# WHEN ASKED IF THEY WILL BECOME MORE ACTIVE GLOBE STUDENTS







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- “Yes. **Field work regarding environmental science excites me** and allows me to learn valuable information I can use in the future.”
- “I am, as participating in this program has **sparked my motivation** to collaborate with other people doing similar studies.”
- “Yes, I **enjoyed this SIP very much** and I would like to participate in more GLOBE activities.
- I would **welcome any opportunity to learn more about the GLOBE program**. I also believe that with the help of Ma’am Antalan, I can achieve great things and contribute more to society with GLOBE.”
- “Yes! **I didn’t expect the GLOBE Program to be this fun that’s why I look forward to be involved in other GLOBE Program events and activities**. I loved and enjoyed this program more than I thought I would.”
- “I am **interested** although unsure of when I will be free to do so.”
- “I think so. Because with the app, **I can learn a lot** about the different spheres of Earth and its different conditions at different locations.”
- “I really found the **course interesting**. It gave me insight on the environment and how climate change and human activity have damaged it. It **sparked within me a passion for the environment** and a desire to **bring more awareness**, so yes, if given the opportunity, I’d involve myself in future GLOBE program events and activities.”
- “Yes, **I want to see some data sent by PSHS students** on the events of the GLOBE Program.”
- “If I were given the chance to do so, yes. Because of the GLOBE program, I learned that **I do have a passion about the environmental sciences**, and if I would be able to hone my skills and knowledge through future GLOBE program events, I would be glad to be more than involved.”
- “I am a bit interested i’m not gonna lie. Since the topics, **specifically aerosols, really interested me** when we were discussing it. Maybe being more involved in GLOBE Program events and activities can help strengthen that interest.”

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- *"I'm interested since I found this course really engaging and interesting since it made me look at angles that I've never considered before. And since I'm planning to undertake my research in the field of biology and pursue a career that has biology involved, the GLOBE Program will most certainly be a great aid in expanding my skills beyond curricular activities."*
- *"Yes. Because under this course I was able to realize the importance and urgency of observing the environment for its benefit."*
- *"Yes! I am really interested in this topic because it's very relevant considering the ongoing effects of climate change, global warming and I just feel it's very important to consider taking this field which is giving more attention to the environment and I also am intrigued by how this GLOBE program and the app works as it is open to everyone and there are even collaborations with scientists & professionals."*
- *"If given the opportunity and the resources, I would be interested in becoming more involved in future GLOBE Program events and activities since in Grade 11, there would be less time for me to engage in extra-curricular activities. Therefore, if given the chance and many incentives, I would join."*
- *"agriculture and earth science isn't really my first choice among the sciences, but i wouldnt mind participating in more events from the globe program, as i know of all its benefits not just for me, but more importantly for the environment."*
- *"Oh, I definitely am! I really, really liked making observations, and I'm keeping the Observer app on my phone to hopefully continue the practice even after this SIP is done."*
- *"If given a chance, yes i would be interested in involving in future GLOBE Programs"*

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Output of Gwyn Bugarin, a Grade 9 student & one of the Most Promising GLOBE SIP students



## Thank you very much for your attention!

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