MVCAC Writers Workshop: From Presentation to Manuscript

March 17, 2023
MVCAC Writer Workshop

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Education Specialist

San Gabriel Valley Mosquito and Vector Control District

Utilizing Technology to Facilitate Student Citizen Science Mosquito-Borne Disease Surveillance

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Levy Sun, Director of Communications
Carol Anne Hagele, Education Specialist

MVCAC 2022

San Gabriel Valley Mosquito & Vector Control District

Remote learning:
No access to students

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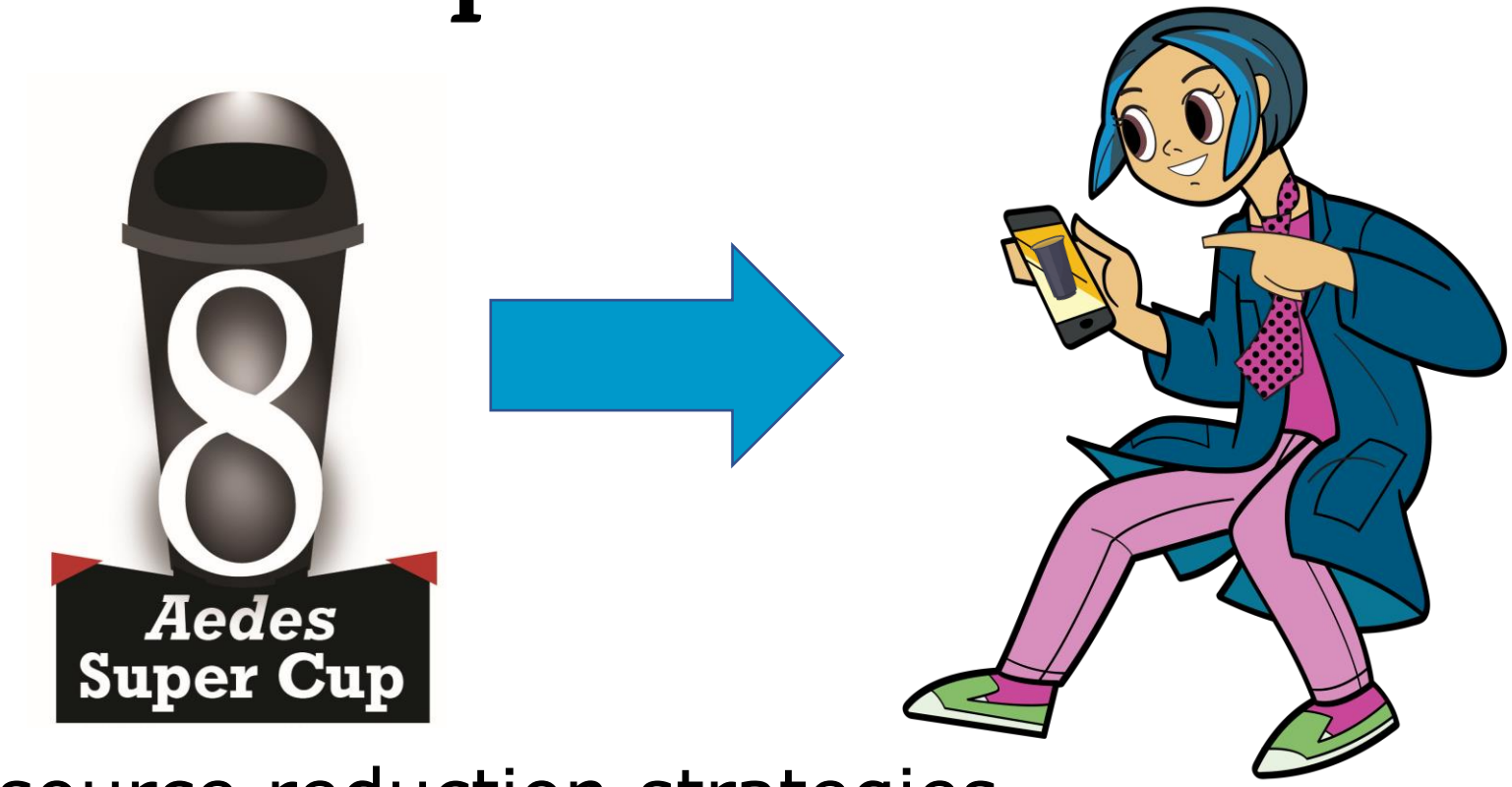
Operation Mosquito G.R.I.D.



- Teaches source reduction strategies
- Provides tools to monitor *Aedes* activity
- Utilizes technology to connect to students

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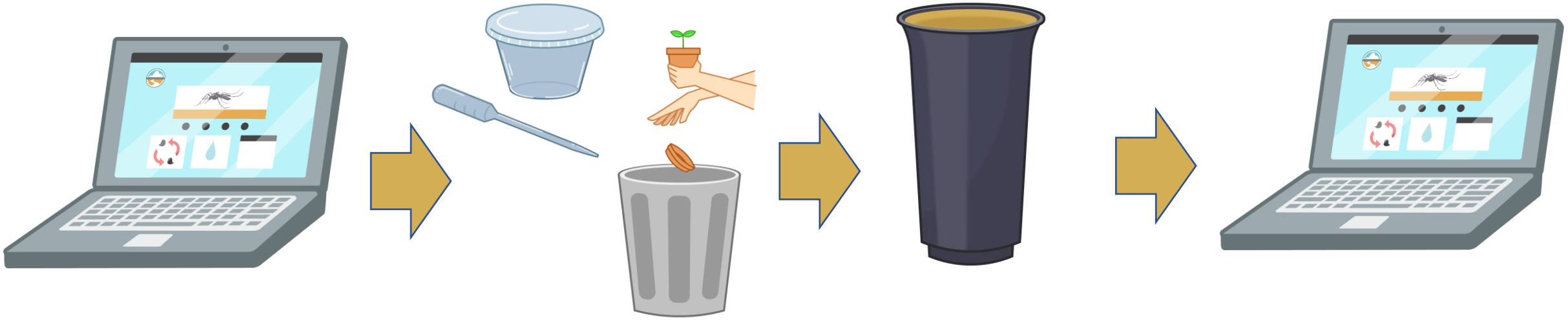
G.R.I.D. Steps for Students



Enroll online & Pre-assessment

Collect water sample, clear yard, & submit results

Trap for 2 weeks & submit results

Post-assessment, Family Feedback, Check-in surveys

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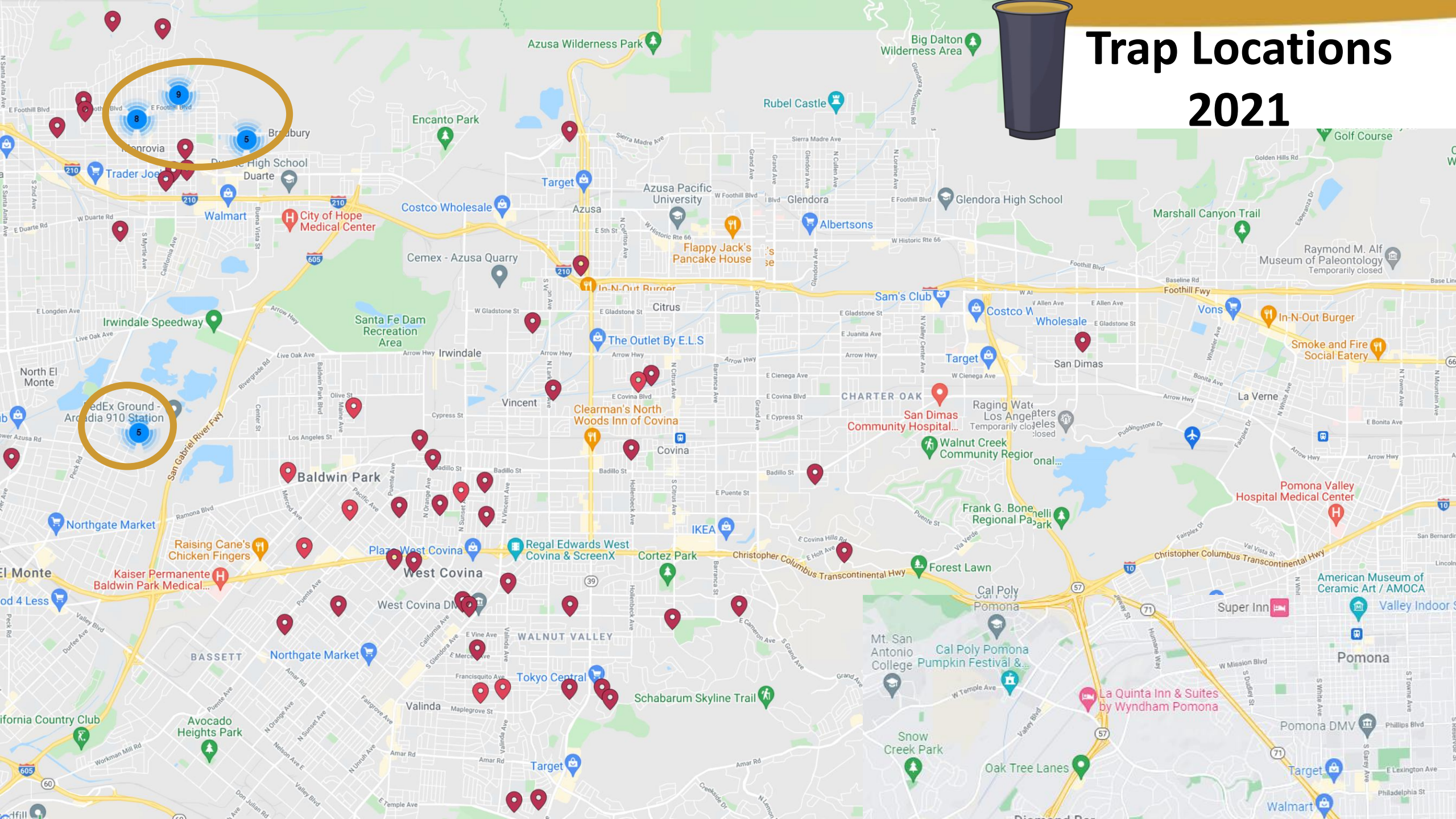
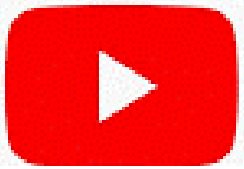
Trap Locations 2021



WiX

zapier



HELLOSIGN

San Gabriel Valley Mosquito & Vector Control District

Support Applications

Acuity Scheduler

Teacher intake and reservations

Citizen Science: Operation Mosquito G.R.I.D.

All Mosquito G.R.I.D. agents across San Gabriel Valley will begin on the same day. Please sign up so we can fully onboard your class(es). Please only sign up your class.

Please ignore the "12:00am" as the system requires us to put a time start. You will select based on the day and select "Continue."

< August 2022 >

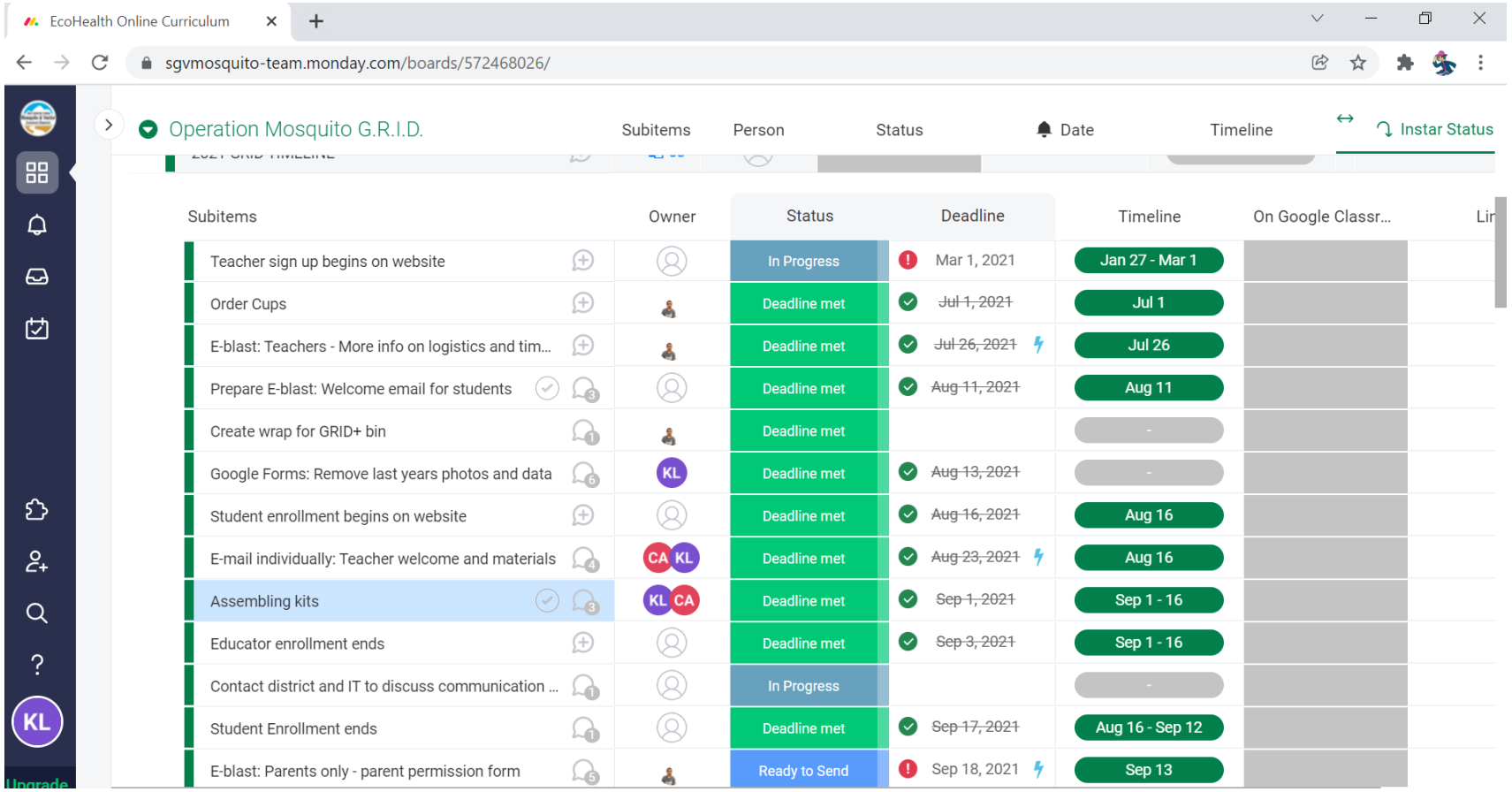
S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

San Gabriel Valley Mosquito & Vector Control District

Support Applications

Monday.com

Listed all necessary tasks, lead, dates, and more



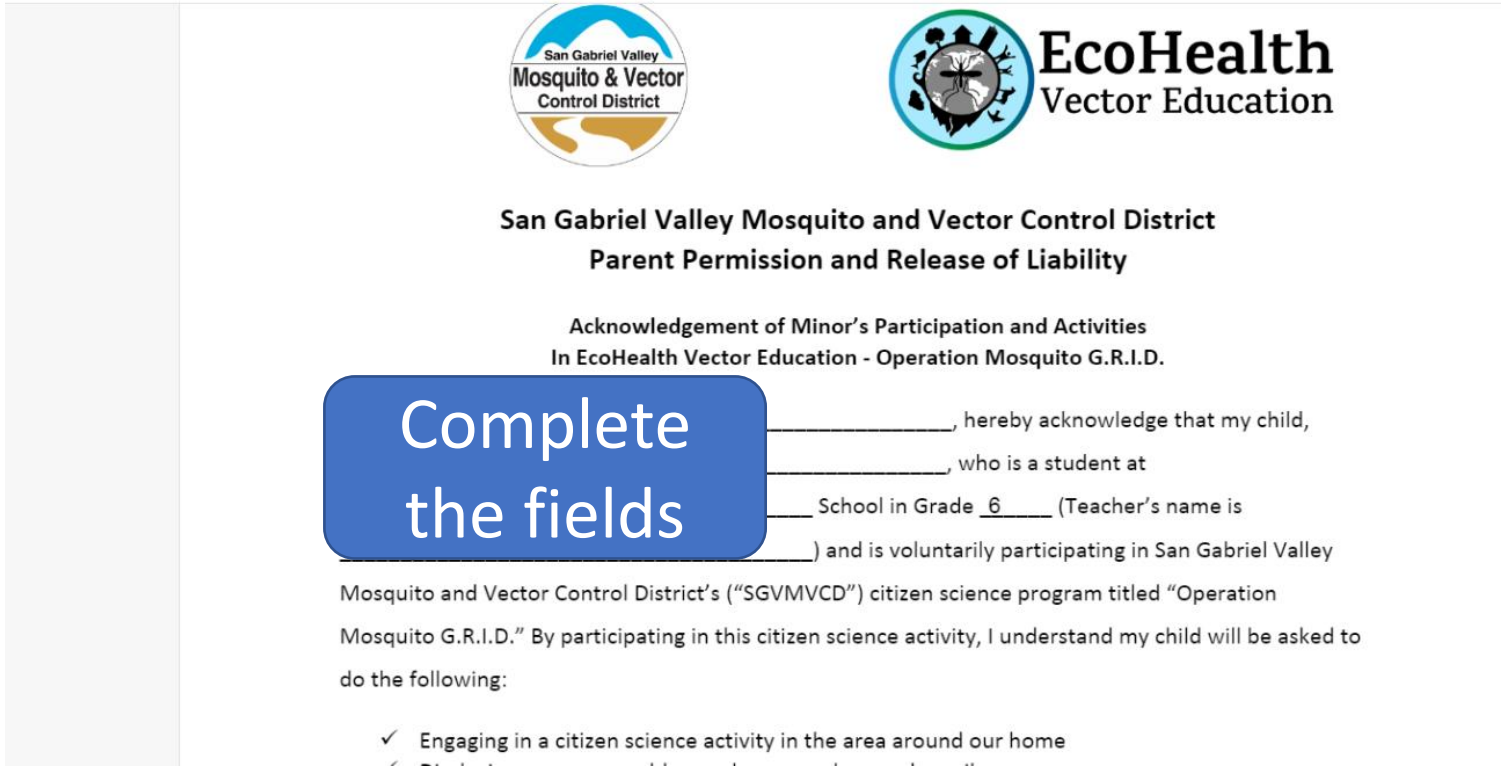
Support Applications

HELLOSIGN

Hello Sign

Parent Permission

Parent Permission form...G.R.I.D. participation



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EcoHealth Vector Education

San Gabriel Valley Mosquito and Vector Control District
Parent Permission and Release of Liability

Acknowledgement of Minor's Participation and Activities
In EcoHealth Vector Education - Operation Mosquito G.R.I.D.

Complete the fields

_____, hereby acknowledge that my child,
_____, who is a student at
_____ School in Grade _6_____ (Teacher's name is
_____) and is voluntarily participating in San Gabriel Valley Mosquito and Vector Control District's ("SGVMVCD") citizen science program titled "Operation Mosquito G.R.I.D." By participating in this citizen science activity, I understand my child will be asked to do the following:

- ✓ Engaging in a citizen science activity in the area around our home

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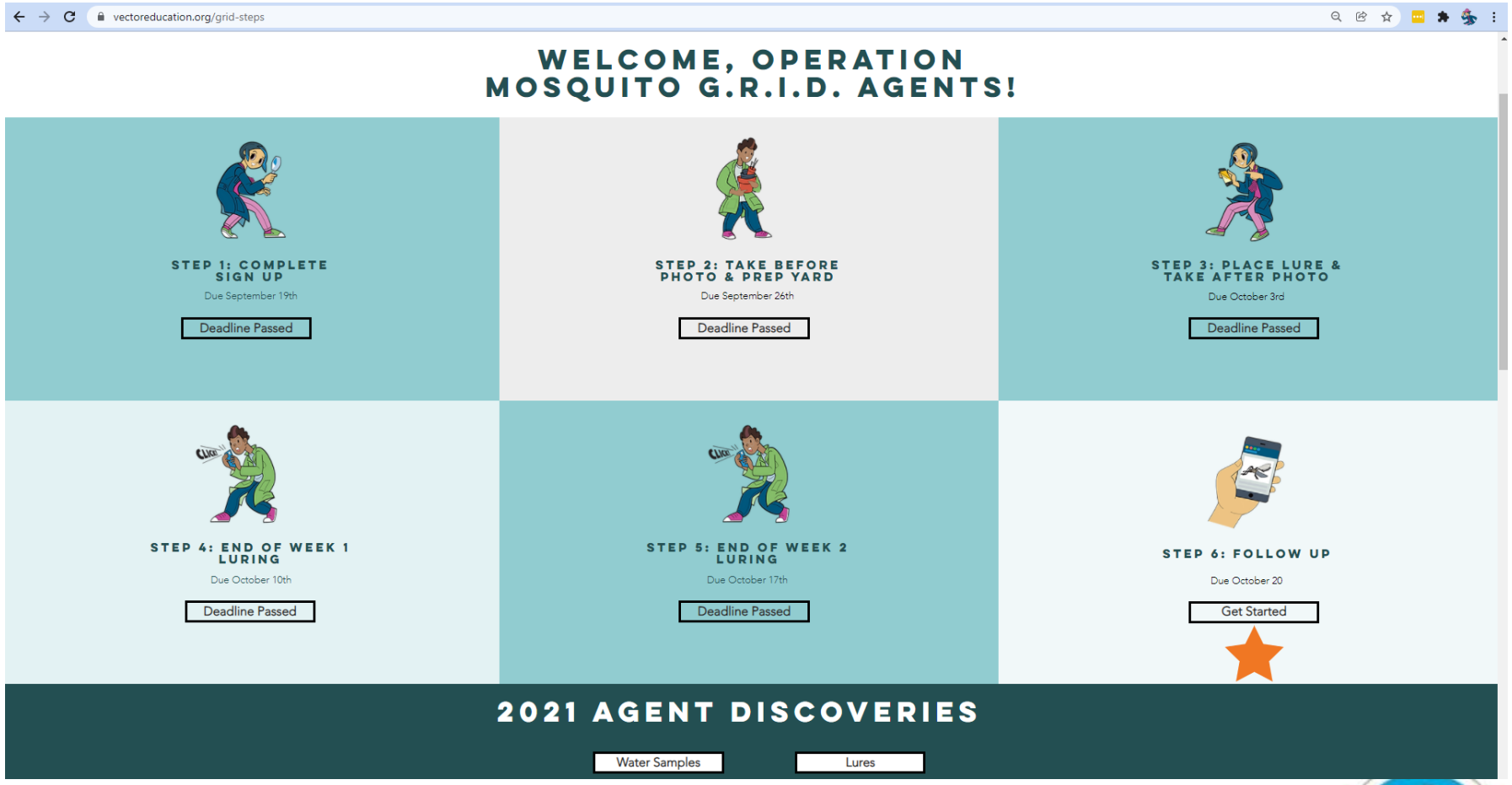
Support Applications

Wix.com

Step-by-step instructions

Community discoveries

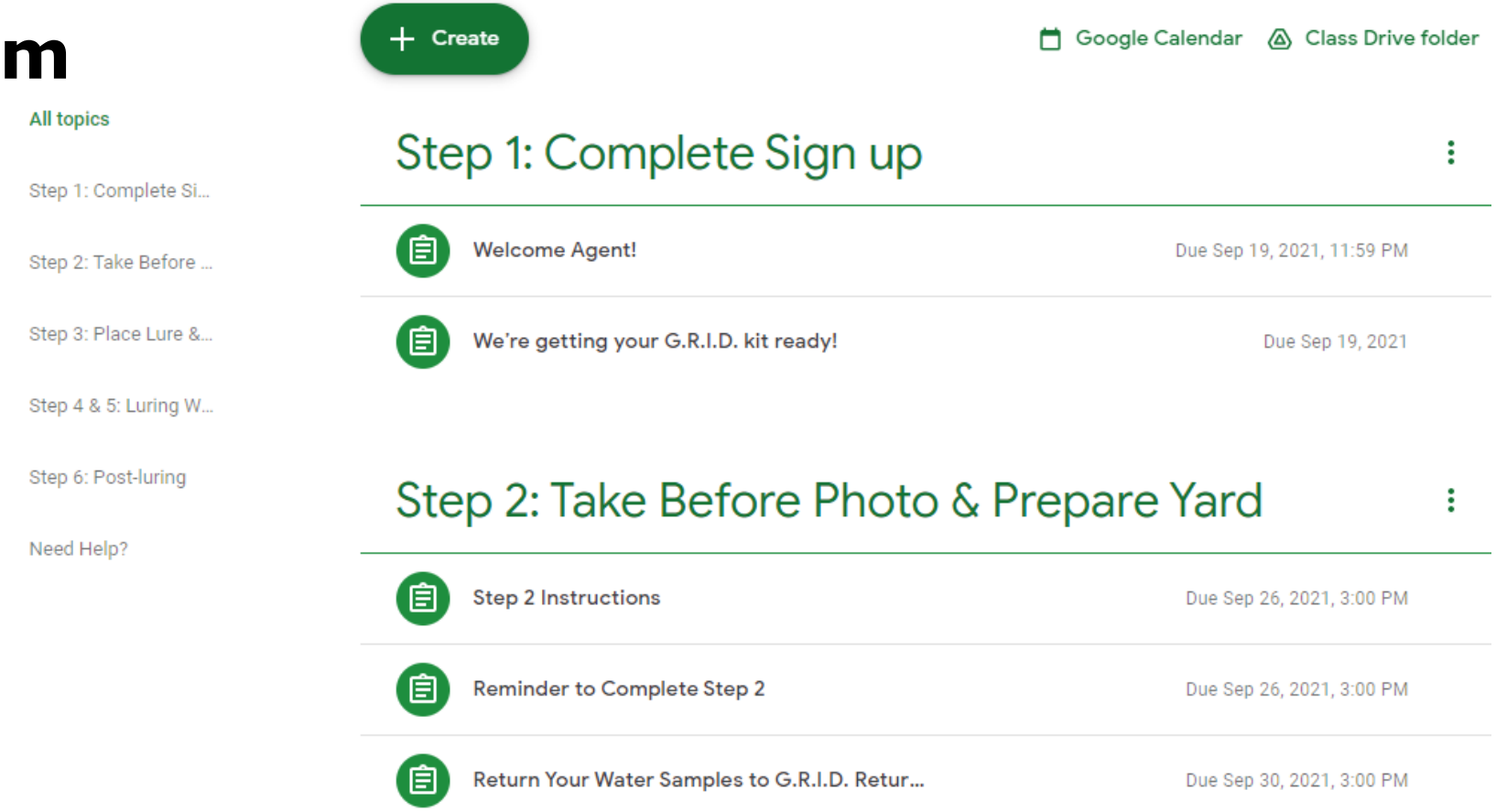


Support Applications

Google Classroom

Google Classroom

Step-by-step instructions



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Support Applications

Mailchimp

Step-by-step instructions

Supportive images

Embedded surveys

Step 5: Return G.R.I.D. Kits to Return Drop Box

Deadline: Tomorrow, October 19, 2021

Hello Mosquito G.R.I.D. Agent << Test Student First Name >>,

Your G.R.I.D. Kits are due tomorrow, **Tuesday, October 19**. Place them in a location where you will remember to take it with you to school!

Family Feedback: Have your parent/guardian complete the family feedback survey. This will help us improve the project for future students!

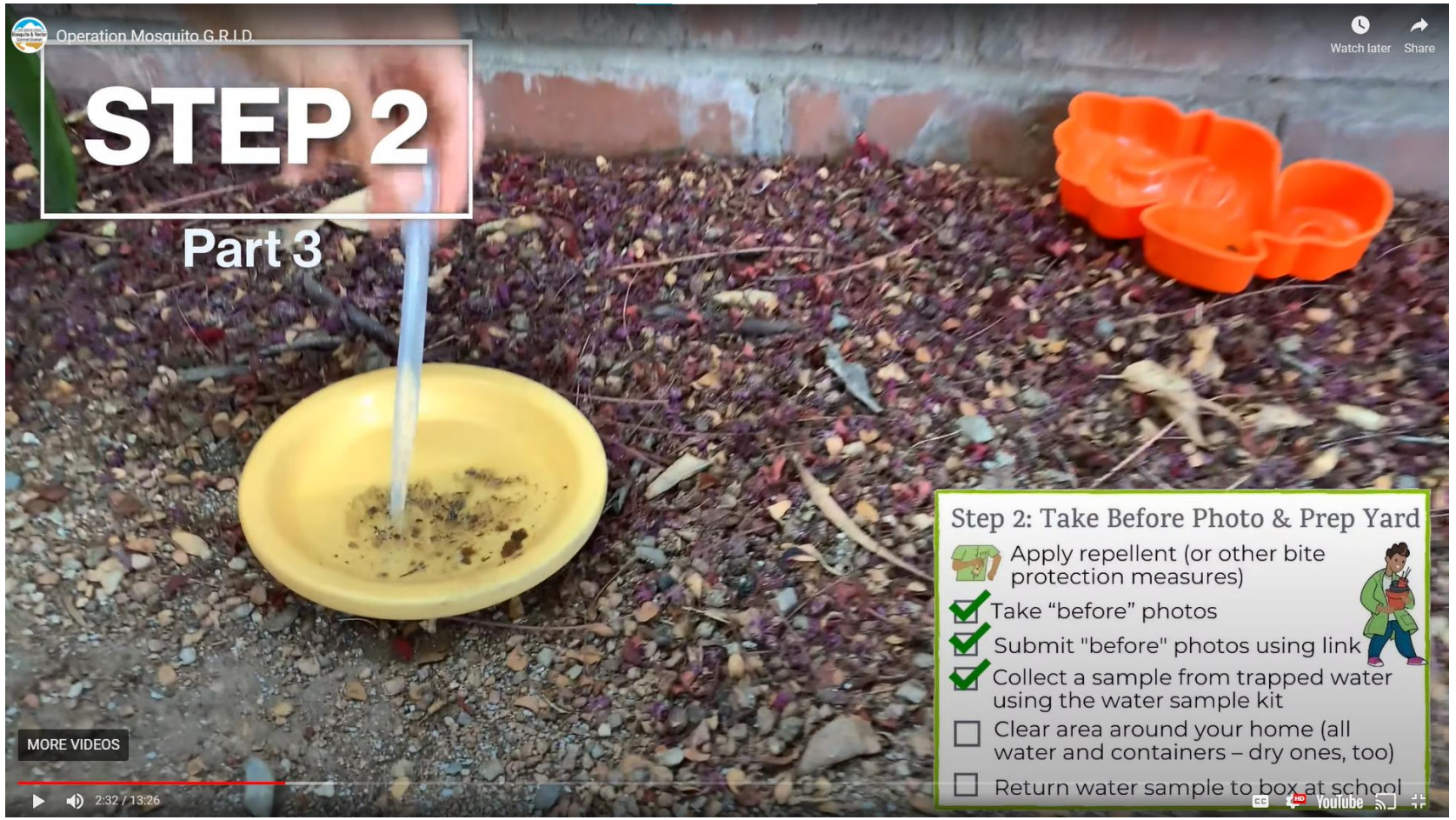
Link to Parent/Guardian Survey

Enlace a la Encuesta Familiar

Support Applications

YouTube

Step-by-step instructions with visuals



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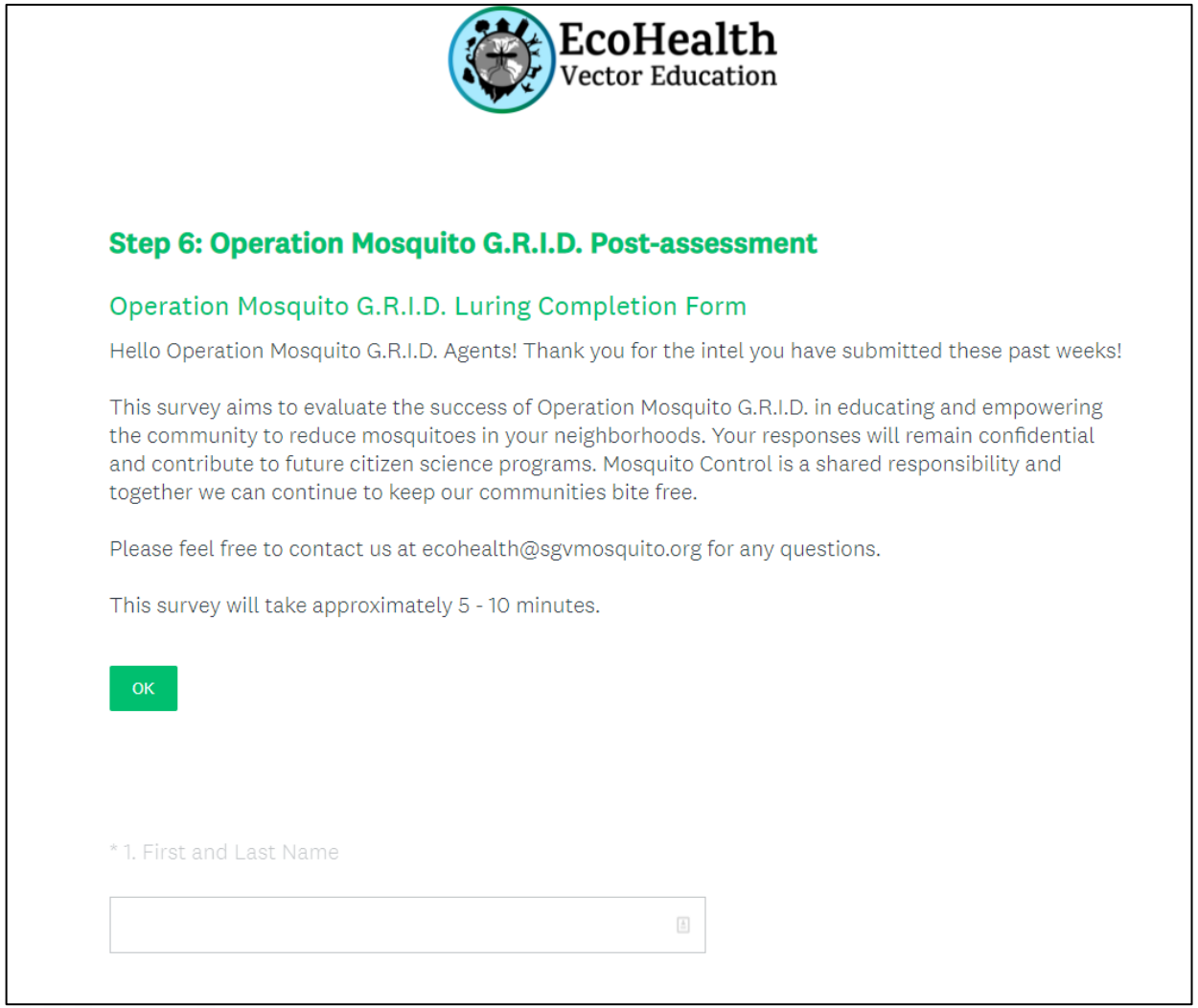
Support Applications

SurveyMonkey

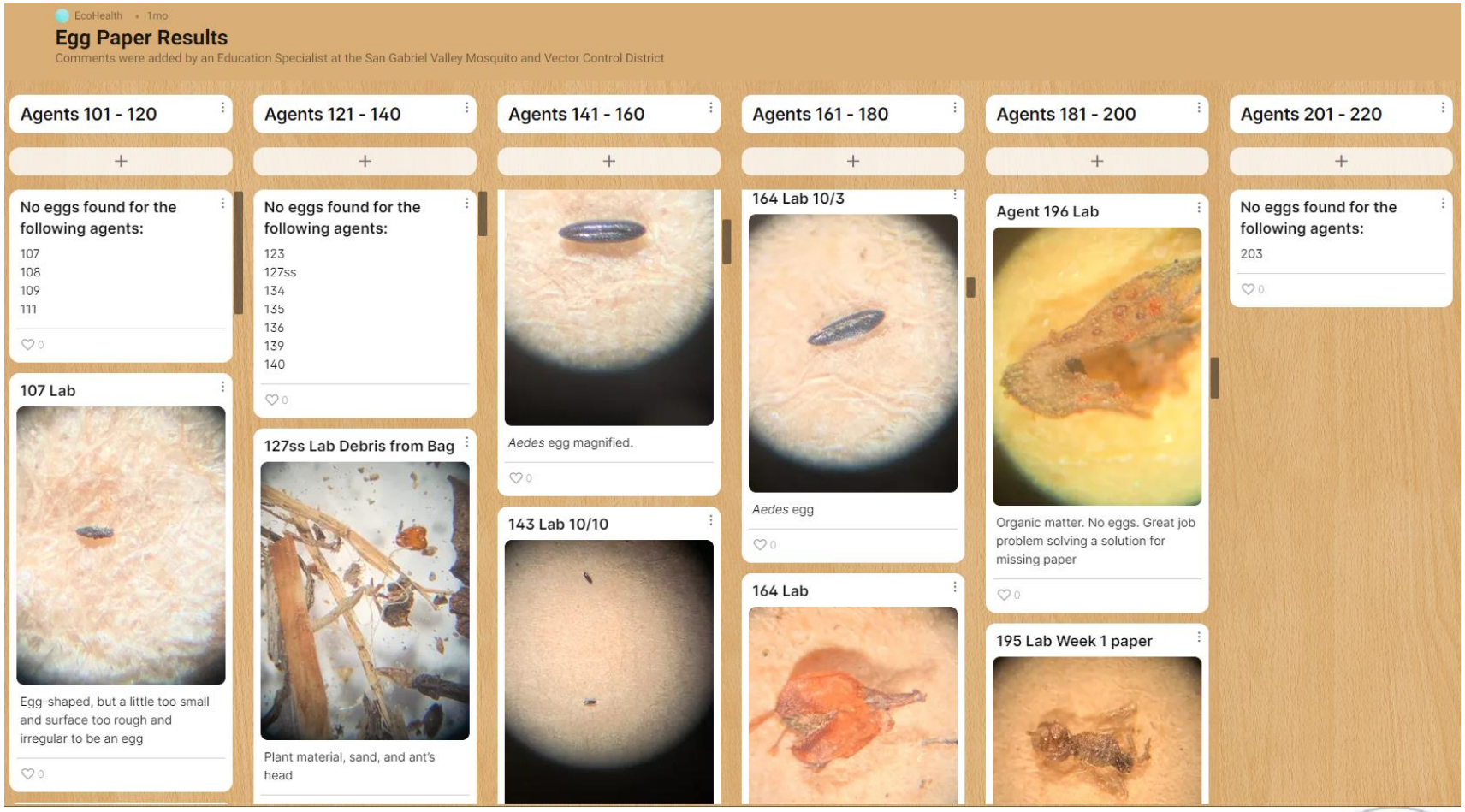
- **Pre-assessment**
- **Photo submissions**
- **Post-assessments**
- **Family survey**
- **1, 3, & 6-month check-in surveys**



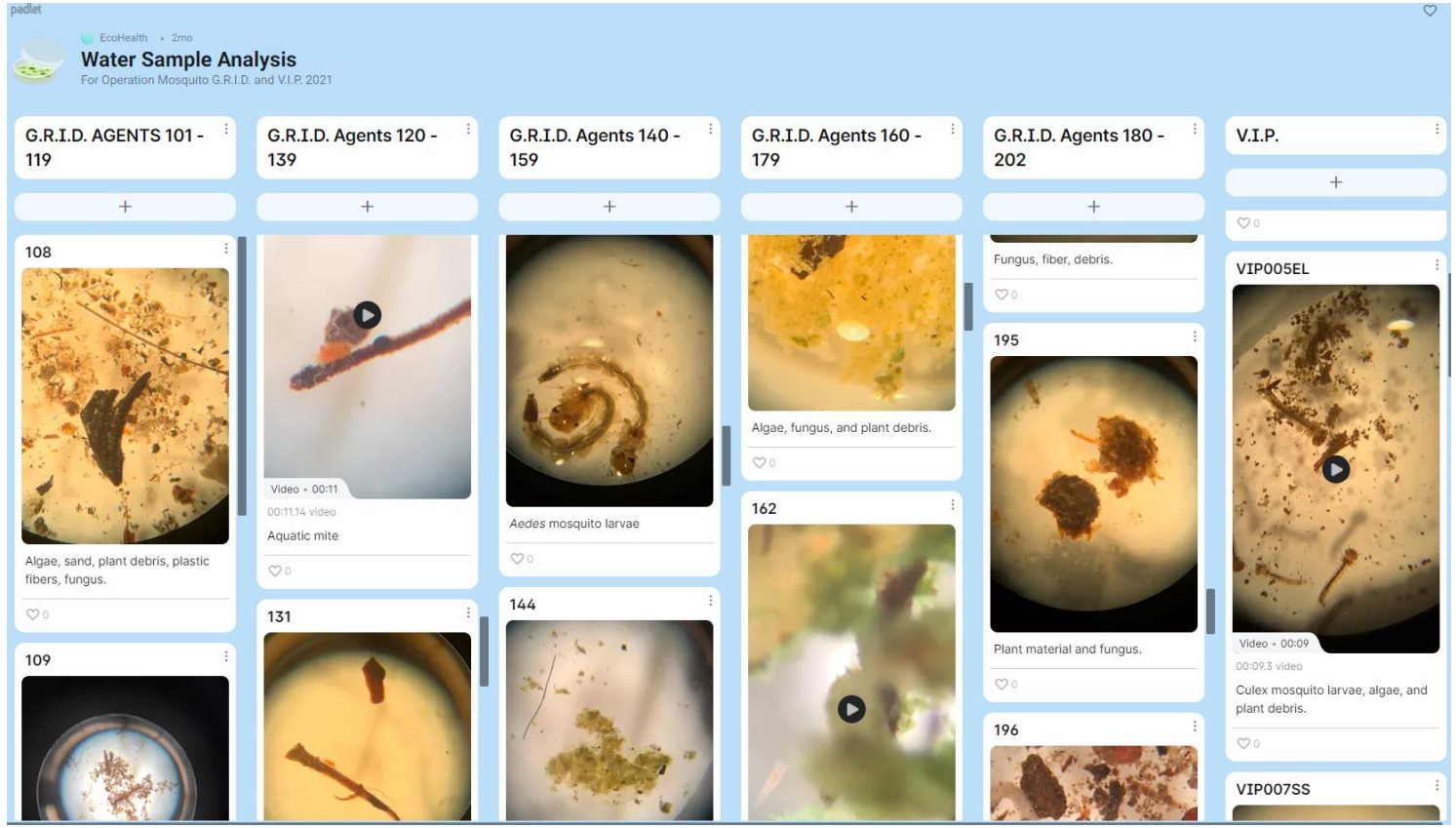
Support Applications

Padlet

Photos of results were posted for all to enjoy



Teacher Feedback



"Being able to see all the photos submitted from other students made [students] realize that they ARE a part of a community of scientists."

- Mrs. Ayala
Teacher

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G.R.I.D. Support Applications

Application	Use	Time Savings per Teacher	Time Savings per Student
Acuity Scheduling Platform	Teacher intake and reservations	15	-
Wix	Hosts instructional webpages & materials	15	-
Monday.com	Project management	-	1
YouTube	Publish instructional videos	-	2
MailChimp	Send E-blasts	-	12
Google Classroom	Post assignments and reminders	-	1
SurveyMonkey	Assessment forms	-	12
HelloSign	Capture parent permission signatures	-	1
Padlet	Post results for community viewing	-	2
	Total administrative time saved:	**30 minutes**	**31 minutes**

Valley Vector Control District

G.R.I.D. 2021 Assessments

Survey Type	Responses	Date
Pre-assessment	104*	August/September
Post-assessment	33	October 15
1-month post	21	November 15
3-month post	33	January 17
6-month post	-	April 2022

*71 students actively participated; 93 successfully enrolled

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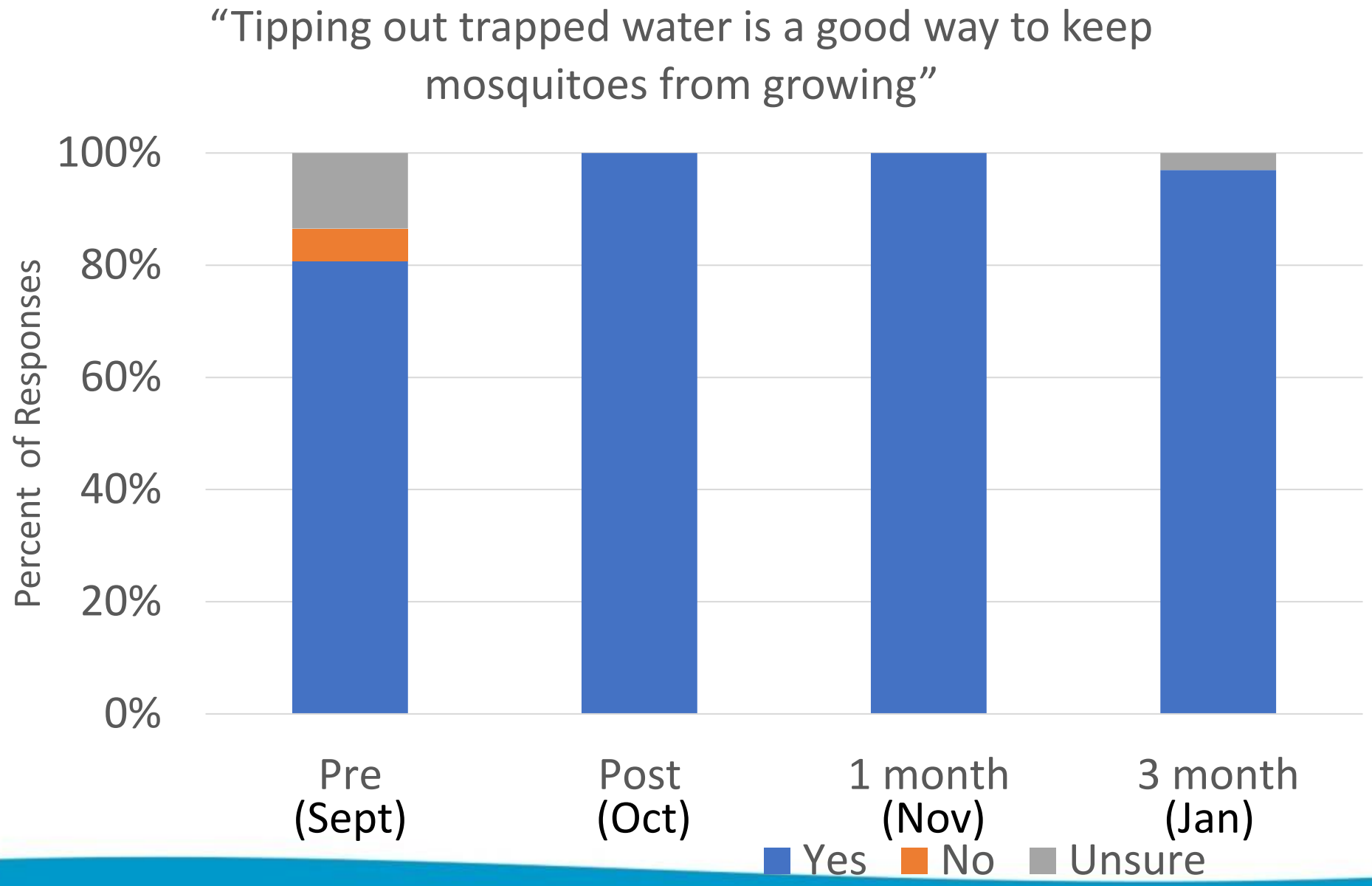
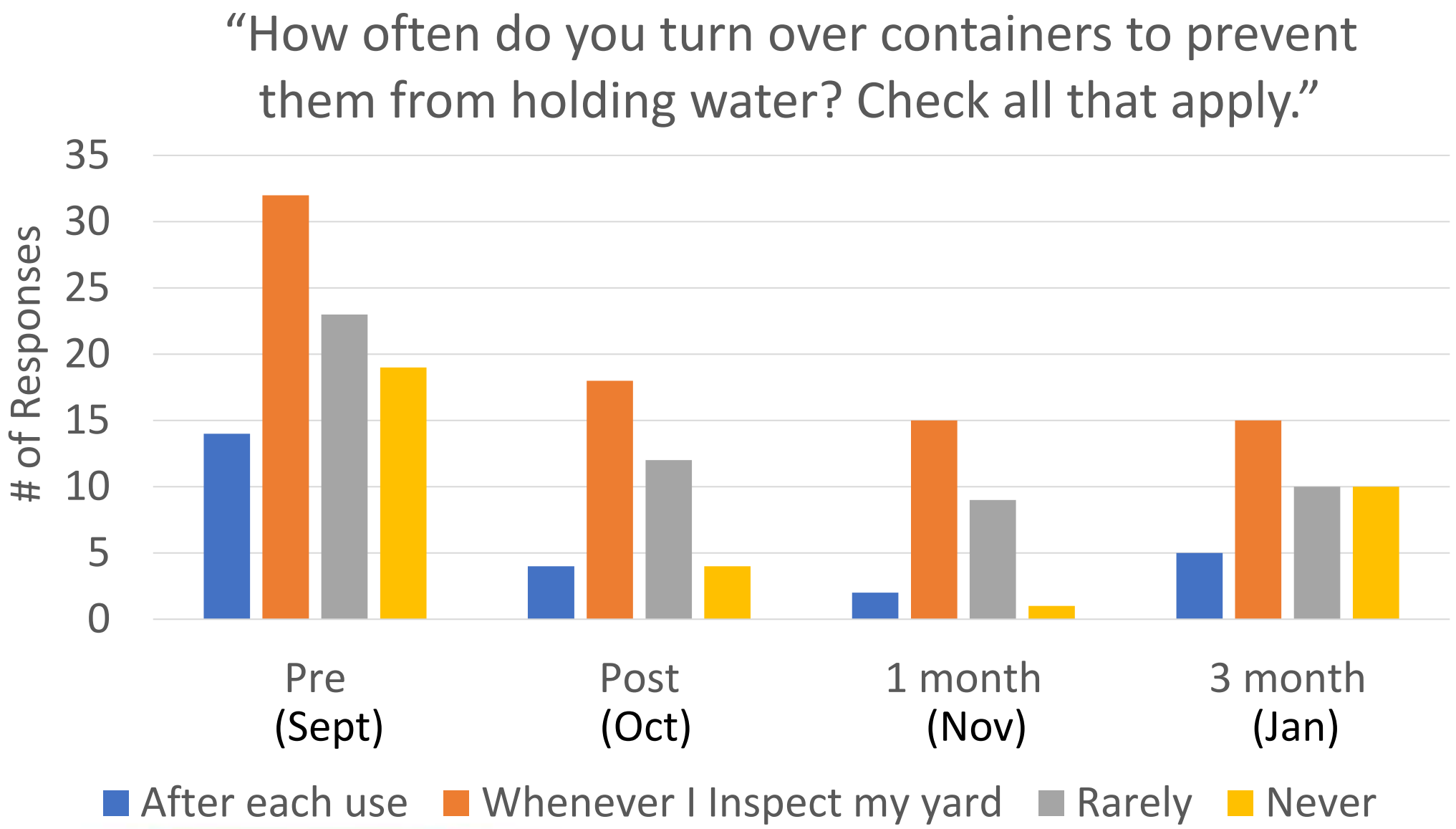
Knowledge Gain Results



Behavior Change Results



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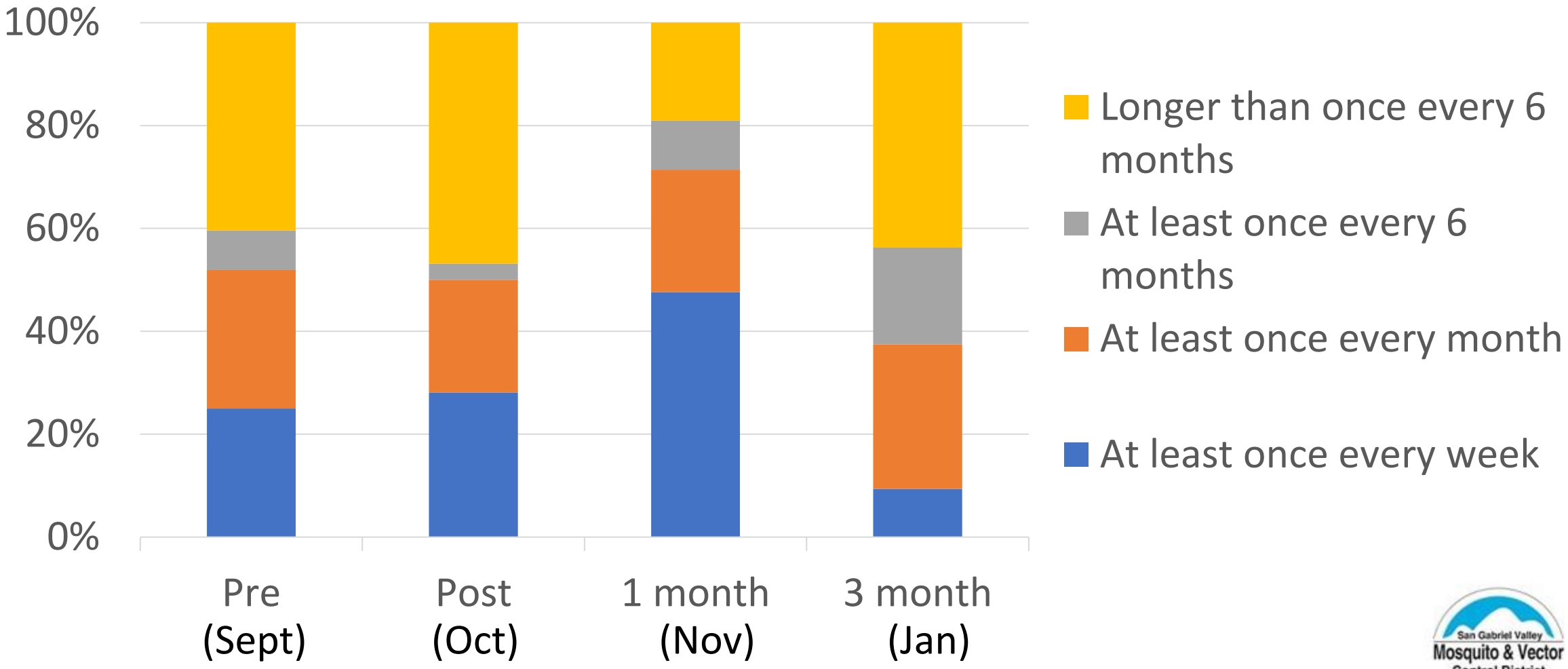
Behavior Change Results

"How often do you inspect your property for trapped water?"



San Gabriel Valley Mosquito & Vector Control District

Tech Challenges

- School district's IT departments
  - Blocked emails
  - School district-established user limitations
- Different learning management systems

- Web pages for every step of the process
- Parents received e-blasts to personal emails

San Gabriel Valley Mosquito & Vector Control District

Improvements for 2022

Challenge	Improvement
Developmentally inappropriate for Grade 3	**V.I.P.:** Elementary School **G.R.I.D.:** Middle School
Teachers & students had different needs	**Option 1:** Virtual Only **Option 2:** In-person visit for enrollment **Option 3*:** Train-the-Trainer

* Potential addition in 2022

San Gabriel Valley Mosquito & Vector Control District

Applications in 2022

Application	Use	2022
Acuity Scheduling Platform	Teacher reservations	√
Monday.com	Project management	√
Wix	Hosts instructional webpages & materials	√
YouTube	Publish instructional videos	√
MailChimp	Send E-blasts to **teachers**	√
Google Classroom	Post assignments and reminders	⊘
SurveyMonkey	Assessment forms	√
HelloSign	Capture parent permission signatures	√
Padlet	Post results for community viewing	√

San Gabriel Valley Mosquito & Vector Control District

Conclusion

Increase access to meaningful, action-based activities

Streamline Communication

Reimagine the use of applications at your disposal

San Gabriel Valley Mosquito & Vector Control District

Acknowledgments and References

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San Gabriel Valley Mosquito & Vector Control District

Thank you!

San Gabriel Valley Mosquito & Vector Control District

Presentation to Manuscript

Utilizing Technology to Facilitate Student Citizen Science Mosquito-Borne Disease Surveillance

Kriztian Luna Corona, Education Specialist
Levy Sun, Director of Communications
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MVCAC 2022

Utilizing technology to facilitate student citizen science mosquito-borne disease surveillance

Kriztian Luna Corona*, Levy Sun, and Carol Anne Hagele

San Gabriel Valley Mosquito and Vector Control District, 1145 North Azusa Canyon Road, West Covina, CA 91790

*Corresponding author: kluna@sgvmosquito.org

Introduction

San Gabriel Valley Mosquito and Vector Control District's (District) EcoHealth Vector Education Program brings K-12 Next Generation Science Standards (N.G.S.S.)-aligned programs to over 550 schools within the District's boundaries. Operation Mosquito G.R.I.D. (Growth Reduction, Increased Detection) is a new California N.G.S.S.-aligned community science program available to all students within our District boundaries. Since 2011, our District has used citizen science to expand mosquito awareness. Operation Mosquito G.R.I.D. was created in 2020 and is an ongoing fall program that teaches citizen scientists source reduction strategies to reduce *Aedes* mosquitoes and provides tools to monitor *Aedes* activity in the San Gabriel Valley. In a time of extended social distancing requirements, the use of technology allows student citizen scientists in both remote and in-person learning to take part in citizen science without the need for face-to- face interaction with District staff.

Methods

Each fall in 2020 and 2021, 22 and 84 (respectively) student citizen scientists, grades 3 - 8, completed enrollment and received Operation Mosquito G.R.I.D. kits. Students inspect the area around their homes, collect stagnant water samples (starting in 2021), clear their properties of all potential sources, deploy an oviposition trap for two weeks, and report their results using digital platforms.

Online applications allow for program optimization during remote and in-person learning. Prior to the start of the program, logistics and project management applications were employed: Acuity Scheduling Platform for Teacher-Staff reservations, Wix for hosting the EcoHealth Vector Education website, HelloSign to capture parent permission signatures, and Monday.com for project management.

The 2021 program has an enrollment period of 1-month. Once enrolled, students complete assignments for 6 weeks. All communication between students and staff occurs via electronic communication. Communication applications include: MailChimp for eblast email instructions and reminders to students and parents, Google Classroom and Gmail for communication with students and teachers, SurveyMonkey for reporting and image submissions, Padlet for water analysis images and descriptions of results in the Virtual Lab, and YouTube for step-by-step, "how-to" video instructions. Pre-assessments are required to complete the enrollment process. Post-assessment surveys are collected at the 1, 3, and 6 month marks. Six-month survey data is collected in the spring (the fall 2021 will be collected in April 2022). Program assessments utilize SurveyMonkey and Google Forms for data collection.

Results and Discussion

Other organizations that have utilized oviposition cups in citizen science programs include: Beach Mosquito Control's "Trapping Young Minds" program in Panama City Beach, Florida; the USDA-ARS' "The Invasive Mosquito Project"; and the Smithsonian Science Education Center's Science for Global Goals project, "Mosquito!" Our program is unique in its use of technology for communication with participants, collection of water samples during source reduction activities, and the reduction of face-to-face teacher or staff involvement.

The use of digital technology increases accessibility for distance learners to participate and facilitates collaboration with other citizen scientists across the San Gabriel Valley. G.R.I.D., employs technology already available and familiar to most students, and empowers students to engage in environmentally safe mosquito control by turning their backyard into a living laboratory. The use of the District's EcoHealth Virtual Lab provides participants with a digital platform to publish their findings and see the results of students at other schools, while honing their N.G.S.S. science and engineering practices. The Virtual Lab gives participants access to a wider student network beyond their own school and promotes a sense of community teamwork and accomplishment. Through the process, students discover they can solve an insect pest problem without the use of broad-spectrum pesticides. In addition to providing education for students and their families, the project also provides *Aedes* eggs for the District's surveillance department.

Student responses to pre- and post-assessment, collected by Google Forms in the 2020 pilot program, revealed increases in positive results in knowledge gain and environmental modification. Students demonstrated

San Gabriel Valley Mosquito & Vector Control District

Pre-Presentation Preparation

- What value will my presentation add to the audience?
  - Time-saving tools
  - Increasing accessibility to our education programs

- Do I have data to support my presentation?
  - Yes- Survey data

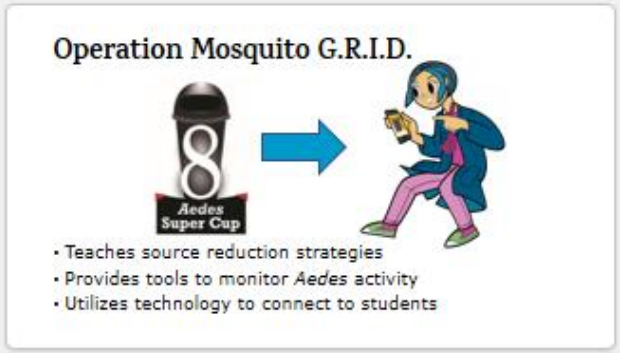
San Gabriel Valley Mosquito & Vector Control District

Introduction: Introduce the topic & purpose

1. Brief district overview
2. Brief program introduction
3. Purpose of the project/presentation/manuscript
4. Previous research*

2

3



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3 activity in the San Gabriel Valley. In a time of extended social distancing requirements, the use of technology allows student citizen scientists in both remote and in-person learning to take part in citizen science without the need for face-to- face interaction with District staff.

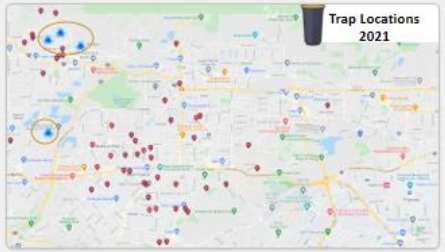
*Included in a different section of the manuscript

San Gabriel Valley Mosquito & Vector Control District

Methods: Who and How

1. Breakdown of participants
2. Breakdown of the program (automations)
3. Data Collection Methods

1



2

3

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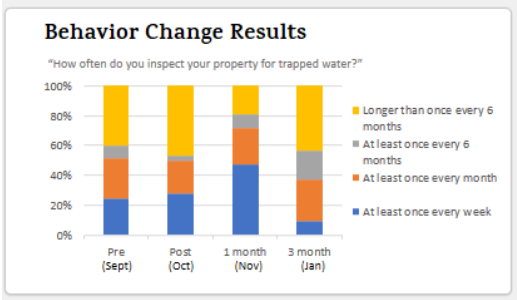
3

Results & Discussion: Findings and Importance

1. Reference other work
2. Connect back to the purpose (accessibility via digital technology)
3. Results
4. Challenges

2 & 3



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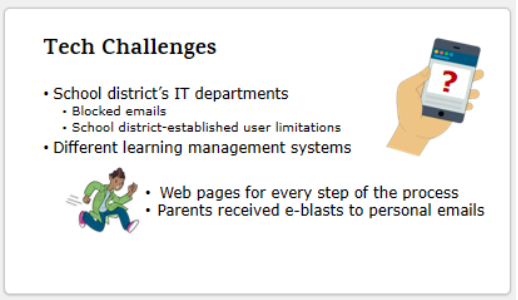

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3 Student responses to pre- and post-assessment, collected by Google Forms in the 2020 pilot program, revealed increases in positive results in knowledge gain and environmental modification. Students demonstrated knowledge gain in the role of stagnant water and containers in mosquito proliferation. The number of students stating that 'baby' mosquitoes grow in stagnant water increased by 22.2%; from 81.8% to 100%. The number of students correctly identifying *Aedes* mosquitoes' preference to lay eggs in small containers increased by 69.8%; from 54.5% to 100%. Students gained efficacy in preventing mosquito production on their property. The percentage of students stating they "Strongly Agree" or "Agree" that they know how to stop mosquitoes from growing in their yard increased by 69.2%; from 59.1% to 100%. Data for 2021 is pending completion of the program.

4 Setting up the program did have its challenges. Each school district's information technology department operates independently and relies on their learning management system of choice. Technological challenges such as blocked emails and school district-established user limitations created communication barriers between vector control staff and students. As a result, web pages dedicated to each step of the process were developed. Teachers provided students the link to each step and parents received e-blasts to their personal emails.

San Gabriel Valley Mosquito & Vector Control District

Conclusion: Meaning & Takeaways

1. Reiterate the focus and conclusions
2. Future- lessons learned
3. Industry impact and application

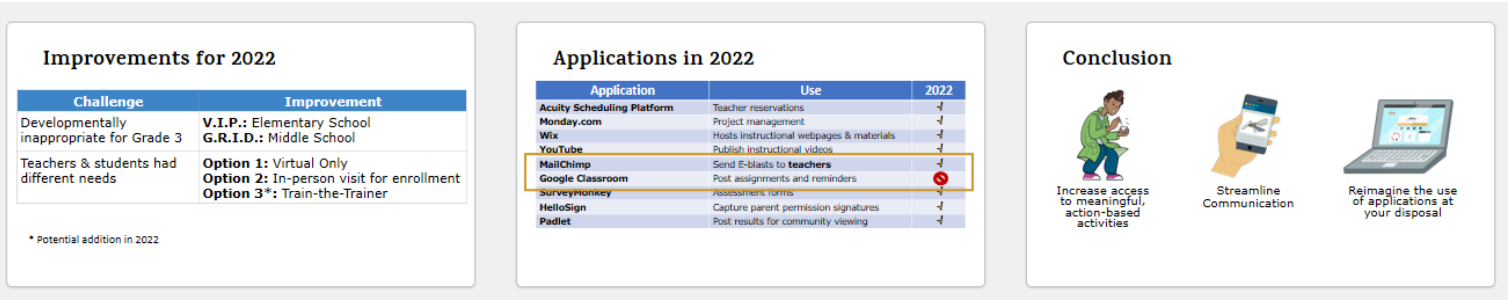
1

Conclusion

Utilizing technology successfully facilitated communication and engagement in Operation Mosquito G.R.I.D.. Whether learning remotely or in-person, digitizing the program increases access to science opportunities and promotes source reduction strategies and *Aedes* surveillance within the District. Although school districts' cyber security restrictions and technical support staff created barriers to the initial setup of the program, we used both website-based communication strategies such as Monday.com and Google Classroom applications to adjust to differences in school district student communication policies. Moving forward, the education program plans to streamline communication channels for all schools. Future education programs with multiple touch points could benefit from using similar technology for communication channels and project management. Agencies should provide ample time to work with school IT departments on communication barriers prior to the initiation of a digitized citizen science program.

2

1 & 3



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Padlet	Post results for community viewing	✓

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Acknowledgements

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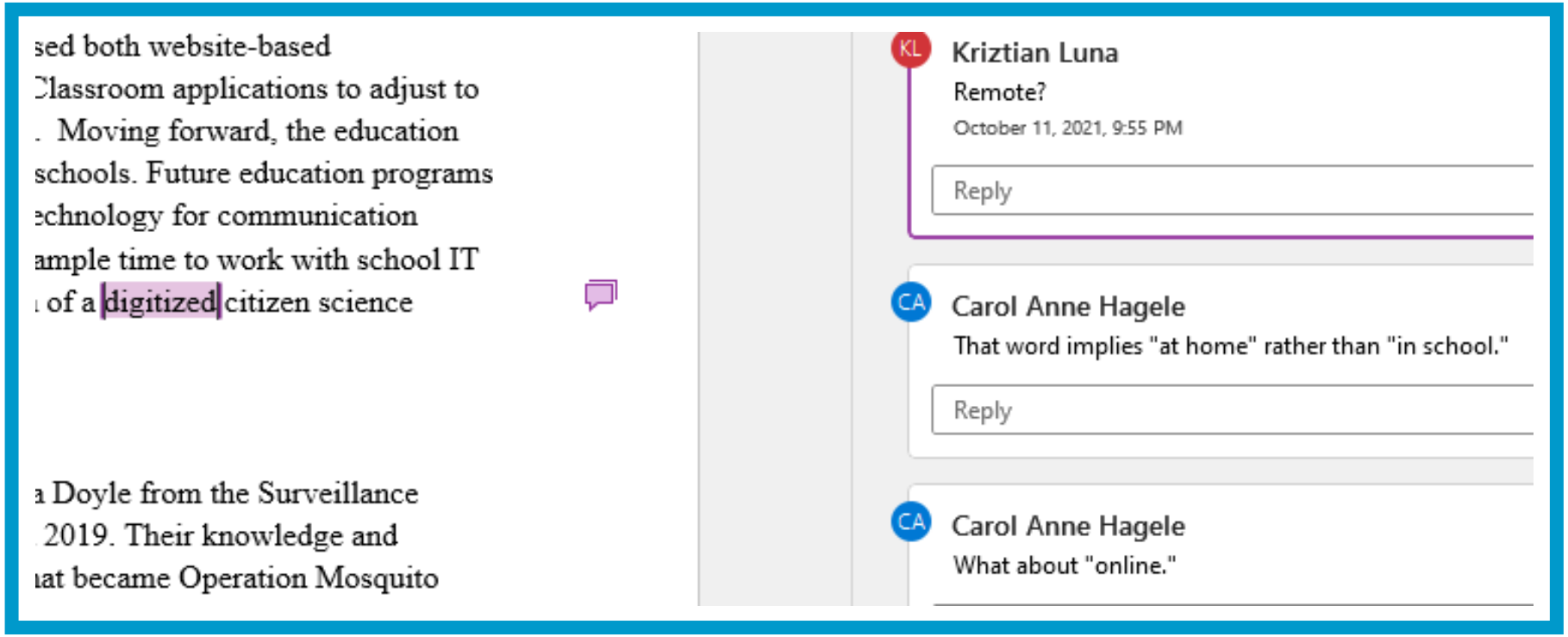
San Gabriel Valley Mosquito & Vector Control District

Proofread and edit

- Spelling
- Grammar
- Word selection
- Sentence structure
- Clarity
- Gaps
- Flow

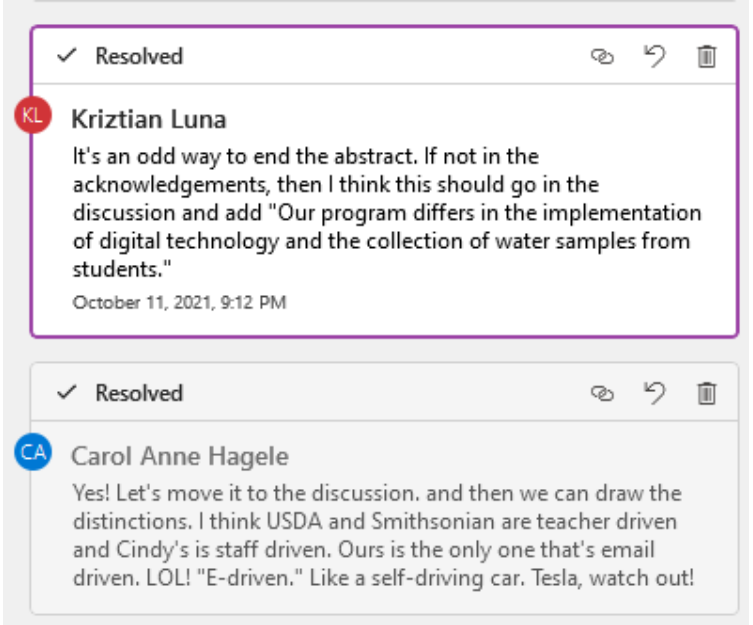


…and edit some more

Results and Discussion

Other organizations that have utilized oviposition cups in citizen science programs include Beach Mosquito Control's "Trapping Young Minds" program in Panama City Beach, Florida; the USDA-ARS' "The Invasive Mosquito Project"; and the Smithsonian Science Education Center's Science for Global Goals project, "Mosquito!" Our program is unique in its use of technology for communication with participants, collection of water samples during source reduction activities, and the reduction of face-to-face teacher or staff involvement.

The use of digital technology increases accessibility for distance learners to participate and facilitates collaboration with other citizen scientists across the San Gabriel Valley. G.R.I.D. employs technology already available and familiar to most students and empowers students to engage in environmentally safe mosquito control by turning their backyard into a living



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How to get started:

1. Prepare the figures and tables.
2. Write the Methods.
3. Write up the Results.
4. Write the Discussion. Finalize the Results and Discussion before writing the introduction. Write a clear Conclusion.
5. Write a compelling introduction.
6. Write the Abstract.
7. Compose a concise and descriptive Title.
8. Select Keywords for indexing.
9. Write the Acknowledgements.
10. Write up the References.

Source: elsevier.com

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Resources

https://www.vectoreducation.org/mvcac

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