2022 Cobb County
Crystal-Growing Competition Report

After we, the Walton STARS Team, hosted the 2021 Timber Ridge Crystal-Growing Competition in the late Spring of 2021 and saw how successful the entire competition was, we decided to host another crystal-growing competition for the local students in the area.

Through this completely virtual competition that was entirely free of charge, we hoped to provide students K-12 a fun STEM experience and an exciting contest to compete in.

Since salt is a safe, relatively common, and easily accessible household product, we settled on centering the competition on growing crystals of salt. The objective of one of the competition categories, the Single Crystal Category, was to grow the largest single crystal of salt with the highest crystal quality. The other competition category, the Creative Crystal Category, focused on the creativity of students, including the creation of multi-crystal objects, such as crystal clumps, challenging students to be creative and inventive with crystal-growing materials, such as salt and aluminum potassium sulfate.

Crystal-growing Activity with Mrs. Amodeo's 8th-grade science class (Dodgen Middle School)

To spread the word about the 2022 Cobb County Crystal-Growing Competition, Susanna and the rest of the Walton STARS officers went to Dodgen on May 16th and May 20th to teach Mrs. Amodeo's class about crystal growing. There, the students were taught the entire process of growing alum (aluminum potassium phosphate) crystals as well as teaching the students about the importance and application of crystallography.

Many of the materials the STARS Team previously prepared for the 2021 Timber Ridge Crystal-Growing Competition were easily adapted for the 2022 Cobb County Crystal-Growing Competition, such as the introduction videos, although other documents were modified to better suit the needs of Dodgen students.

Here are all the resources that the Walton STARS Team modified for this year's 2022 Cobb County Crystal-Growing Competition:
https://drive.google.com/drive/folders/1PEhNEyG43y4FMEV5G7byCS0aPiqc3BMd?usp=sharing

May 16th, 2022: Day One

Susanna, Selina, and Rita, (Walton STARS) with the assistance of Mrs. Amodeo, prepared the lab set up for Mrs. Amodeo's ~180 students. They split each class session into two parts:

Part 1 – Introduce students to crystallography with a presentation:

- Pique students' interest with glow-in-the-dark crystals.
- Explain what is a crystal, crystal lattice, unit cell, etc.

- Explain the similarities and differences between undersaturated, saturated, and supersaturated solutions.
- Explore two methods to make crystals form.
- Overview of the hands-on portion of the class session.

Part 2 – Hands-on portion of the class session, involving the creation of their crystal solutions:

- Materials needed: weigh boats, scales, alum, scoopula, graduated cylinders, plastic cups, plastic spoons, Sharpies, highlighters, and crystal journal pages.
- Students partner up, use one of the prepared 6.7g of alum in the weigh boat and put it in their cup.
- Use a graduated cylinder to measure 50 mL of water into a plastic cup.
- Mix solution.
- Break open the highlighter and squeeze the ink into the solution.
    - Alternatively, add in a crystal inducer, such as a pointy rock or a pipe cleaner.

Part 3 – Start guiding the students through the Crystal Journal:

- Methods
- Observations

May 20th, 2022: Day Two

Susanna, Selina, Andrew, and Dina (Walton STARS) prepared a presentation for Mrs. Amodeo's students and helped the students observe their crystals.

Part 1 – Crystallography presentation:

- Review of what is a crystal and how it is formed.
- Review of undersaturated vs. saturated vs. supersaturated solutions.
- Overview of how to make inferences and conclusions about their crystal experiments.
- Explanation of the good qualities for crystals in both the Single Crystal Category and the Creative Crystal Category.

Part 2 – Crystal Journal:

- Inferences and Conclusions.
- Sketches of crystals.

Part 3 – Crystallography Kahoot:

- Review of all the information learned in both days with a massive reward for students winning the game
    - First place: Large Hershey's.
    - Second place: King-size skittles.
    - Third place: King-size milk duds.

Hours volunteered for this competition

The Walton STARS Team went to Dodgen on two days, May 16th and May 20th, to teach the students about crystallography. Susanna, as a senior who had already completed all her school courses, was able to attend both days (8:20 am to 4:20 pm both days). Selina was only able to attend for the last period of May 16th but was able to teach the entire day of May 20th as she had exempted her exams that day. Andrew and Dina both attended the entire day of May 20th but were not available on May 16th. Finally, Rita was able to teach during the last period of May 16th but was unable to attend during May 20th.

Crystal Judging

On June 29th, Susanna, Selina, Andrew, and Rita all logged onto Zoom and spent 4.5 hours grading the student's crystals based on their clarity, size, and saturation of color, if any.

The score of each crystal submission was graded on a scale of 0 to 10 for both the crystal itself and the crystal journal(s) that were submitted. The scores of both were then added up to a total score out of 20.

For the Single Crystal Category (with 10 student participants), the top three entries earned medals and award certificates, while the rest earned superlative certificates. For the Creative Crystal Category (with 125 student participants), top ten entries earned medals and award certificates, while the next top 24 entries earned superlative certificates. The rest of the Creative Crystal Category participants earned certificates of participation. Full list of competitors and their placements can be found after the Appendix.

Awards Ceremony

The email that was sent to the 2022 Cobb County Crystal-Growing Competition winners:

> *The medals and award certificates for the 2022 Cobb County Crystal-Growing Competition are finally here!! It was so fun working with you in Mrs. Amodeo's science class last year. Your crystal journal and crystal submission were very impressive, and we will be recognizing your achievement and hard work at the 2022 Cobb County Crystal-Growing Competition Awards Ceremony, which will be held this Friday, March 24th, 2023, at 5:00pm at the East Cobb Park upper pavilion.*
>
> *The ceremony reception starts at 5:00pm (raffle tickets will be passed out during this time), and the awards ceremony officially begins at 5:30pm.*
>
> *This awards ceremony is proudly funded by our sponsor the American Crystallographic Association, which boasts more than 40 Nobel Prize Laureates and over 1,300 members from 37 countries worldwide (https://www.amercrystalassn.org/crystal-growing-contests).*
>
> *The students listed here are invited to the awards ceremony and will receive their awards certificate (with the ACA logo) and certificate holder at the awards ceremony. Winners of the Scientific Achievement Award and the Medal of Scientific*

Excellence will also receive crystal pendants. Recipients of the Medal of Scientific Excellence will additionally receive the STEM medal.

Also, at the end of the awards ceremony, we will be holding a raffle drawing, where nine lucky students will be chosen to take home a National Geographic Mega Crystal Growing Lab ($40) for vibrant-color crystals and real gemstone specimens.

Publicity

https://eastcobbnews.com/2022-cobb-crystal-growing-competition-winners-announced/

Conclusion

Overall, the 2022 Cobb County Crystal-Growing Competition was a very fun and engaging activity both for the students and for us, the Walton STARS Team. Seeing them so excited to learn about crystals and crystallography made us feel just so happy for inspiring and teaching these young students. Watching their love and passion for science grow as they wrote down their observations and conclusions in their crystal journal made us feel proud to be part of this community.

This is the reason why we put so much effort into hosting the 2022 Cobb County Crystal-Growing Competition: we want to share our love of science with our community.

As the Walton STARS Team, we see the beauty in crystallography with its simplicity and complexity. We see its significance and key role in structural biology. We see the importance of spreading the excitement to younger generations, for we see its promising horizons, awaiting to be explored.

This is STARS, inspiring others and spurring creativity, kindling the spirit of scientific exploration.

Reported by Susanna Huang and Selina Huang

July 2023

Appendix

All Competition materials:
https://drive.google.com/drive/u/3/folders/1PEhNEyG43y4FMEV5G7byCS0aPiqc3BMd

Program outline for STARS crystal-growing activity in Mrs. Amodeo's class:
https://docs.google.com/document/d/1e_kBN6I_tYkNkZquIgNPPm_daTEkq220gqlx0m7BVVQ/edit?usp=sharing

Crystal Journal:
https://drive.google.com/file/d/1he3sPXdHACKGsednWv2U-LSUO0K3vocK/view?usp=sharing

Competition flyer:
https://drive.google.com/file/d/1Cdtf5o2gF45HenzL0a3e7hJtbB5KiM-_/view?usp=sharing

STARS Presentations given to Mrs. Amodeo's classes:
May 16th, 2022 (Monday)
https://docs.google.com/presentation/d/1m4MMtm95IBaPzffE52UeGaXpuq35C7V92YYIbcwBosU/edit?usp=sharing

May 20th, 2022 (Friday)
https://docs.google.com/presentation/d/1Gd_ExxVzdB6Ro6wHuDdwcTlPBT3l7zzbDsAkTfRJbUI/edit?usp=sharing

Awards Summary	
Single Crystal Category	6 entries
Medal of Scientific Excellence	4 students
Scientific Achievement Award	6 students
Honorable Mention	0 students
Cluster Crystal Category	64 entries
Medal of Scientific Excellence	19 students
Scientific Achievement Award	47 students
Honorable Mention	59 students
Total	70 entries
Medal of Scientific Excellence	23 students
Scientific Achievement Award	53 students
Honorable Mention	59 students
Total students in the competition	135 students

List of Competitors and their competition placements

Single Crystal Category

Partner #1	Partner #2	School	Crystal Score	Journal Score	Total Score	Award	Title
Steven Huang	N/A	Timber Ridge Elementary School	9.5	7.7	17.2	Medal of Scientific Excellence	Champion of Competition Superior Entry: Exceptional Crystal-Growing with excellently detailed Crystal Journal
Sheling Cai	Jalon Wang	Walton High School	7.6	7.8	15.4	Medal of Scientific Excellence	Superior Entry: Most Ocean-blue Crystal Award
Rita Dwivedi	N/A	Walton High School	8.1	7.0	15.1	Medal of Scientific Excellence	Superior Entry: Most Beautiful Gem-like Crystal Award
Nick Schug	Woody Starnes	Dodgen Middle School	7.1	2.5	9.6	Scientific Achievement Award	Largest Snowflake Crystal Title
Aidan Simons	Matthew Wilson	Dodgen Middle School	4.0	1.45	5.45	Scientific Achievement Award	Tiniest Snowflake Crystal Title
Bennett Hill	Evan Kambies	Dodgen Middle School	3.75	1.5	5.25	Scientific Achievement Award	Cutest Crystal Title

Creative Crystal Category

Partner #1	Partner #2	School	Crystal Score	Journal Score	Total Score	Award	Title
Lisa Onodera	Sadie Hernandez	Dodgen Middle School	7.2	8.75	15.95	Medal of Scientific Excellence	Superior Entry: Most Detailed Journal Award
Max Needle	Una Tesovic	Dodgen Middle School	5.7	9.65	15.35	Medal of Scientific Excellence	Superior Entry: Most Innovative Award
Kohki Onodera	Adi Swahney	Dodgen Middle School	4.8	8.75	13.55	Medal of Scientific Excellence	Superior Entry: Most Artistic Crystal Award
Sophia Tao	N/A	Dodgen Middle School	6.3	7.1	13.4	Medal of Scientific Excellence	Superior Entry: Most Sophisticated Journal Award
Kathrynn Benninger	Arden Barry	Dodgen Middle School	6.8	6.3	13.1	Medal of Scientific Excellence	Superior Entry: Exceptionally Clear Crystal Award
Vibha Vijay	Aashritha Kudumula	Dodgen Middle School	6.95	6.1	13.05	Medal of Scientific Excellence	Superior Entry: Exceptionally Large Crystal Award
Tony Chen	Hyunsoo Jang	Dodgen Middle School	6.85	6.0	12.85	Medal of Scientific Excellence	Superior Entry: Most Colorful Crystal Award
Brian Clark	Dillan Vuong	Dodgen Middle School	7.0	5.5	12.5	Medal of Scientific Excellence	Superior Entry: Largest and Colorful Crystal Award
Aleeza Bandukwala	Vidya Bhatnagar	Dodgen Middle School	5.15	7.1	12.25	Medal of Scientific Excellence	Superior Entry: Beautiful Crystal Award
Violet Cox	Natalie Ruth	Dodgen Middle School	6.15	6.0	12.15	Medal of Scientific Excellence	Superior Entry: Faceted Crystal Award
Eliza Saifee	Jake Rheaume	Dodgen Middle School	5.8	5.9	11.7	Scientific Achievement Award	Shimmering Crystals Title

Nathan Kim	Zak Globerman	Dodgen Middle School	6.0	5.6	11.6	Scientific Achievement Award	Shimmering, Large Crystals Title
Kavin Prakash	Kian Attar	Dodgen Middle School	5.6	5.8	11.4	Scientific Achievement Award	Shimmering Large Crystals Title
Nihal Viswanathan	N/A	Dodgen Middle School	2.99	8.23	11.23	Scientific Achievement Award	Detailed Journal Title
Ansley Bruder	Seena Cuddapah	Dodgen Middle School	6.7	4.5	11.2	Scientific Achievement Award	Vibrantly Colored Crystals Title
Farida Anany	Tate Adams	Dodgen Middle School	3.3	7.8	11.1	Scientific Achievement Award	Amazing Crystal Sketches Title
Kellen Gornall	Vihaan Anumula	Dodgen Middle School	5.05	6.0	11.05	Scientific Achievement Award	Clear Crystals Title
Mythili Shah	Niki Sharifi	Dodgen Middle School	5.9	5.05	10.95	Scientific Achievement Award	Amazing Crystal Sketches Title
Grace Brinckerhoff	Ella Powell	Dodgen Middle School	5.0	5.55	10.55	Scientific Achievement Award	Vibrantly Colored Crystals Title
Nithin Siva	Claire Harper	Dodgen Middle School	4.4	6.05	10.45	Scientific Achievement Award	Vibrantly Colored Crystals Title
Lorenzo Montecinos	Leo Vincent	Dodgen Middle School	5.3	4.95	10.25	Scientific Achievement Award	Vibrantly Colored Crystals Title
Alena Wolfe	Shalin Pokharel	Dodgen Middle School	1.65	8.5	10.15	Scientific Achievement Award	Amazing Mappa Mundi Crystal Sketches Title
Alfredo Guadarrama	Diego Mateo	Dodgen Middle School	7.2	2.9	10.1	Scientific Achievement Award	Vibrantly Colored Crystals Title

Aashrith Muppalla	Blaine Davies	Dodgen Middle School	4.85	5.0	9.85	Scientific Achievement Award	Shimmering Crystals Title
Layla Varghese	Shanthi Ramprasad	Dodgen Middle School	3.57	6.2	9.77	Scientific Achievement Award	Most Powdered Crystal Title
Gison Xu	Westin Chen	Dodgen Middle School	6.7	2.97	9.67	Scientific Achievement Award	Most Creative Crystal Title
Harshid Balachandar	Arjun Sanghavi	Dodgen Middle School	4.15	5.4	9.55	Scientific Achievement Award	Shimmering, Large Crystal Title
Ava Hortin	Jack Lambert	Dodgen Middle School	4.6	4.85	9.45	Scientific Achievement Award	Shimmering Crystal Title
Eli Suddeth	Noah Wiley	Dodgen Middle School	5.55	3.75	9.3	Scientific Achievement Award	Clear Crystal Title
Tatyana Solnteseva	Shinjon Rafique	Dodgen Middle School	4.7	4.5	9.2	Scientific Achievement Award	Shiny Crystal Title
Grace Zeleke	Ella Meyers	Dodgen Middle School	5.4	3.75	9.15	Scientific Achievement Award	Shimmering Crystal Title
Rajat Ravi	Jack Childress	Dodgen Middle School	4.4	4.7	9.1	Scientific Achievement Award	Coolest Colored Crystal Title
Natalie Phan	Sasha Gupta	Dodgen Middle School	4.7	4.4	9.1	Scientific Achievement Award	Exceptionally Vibrant Crystal Title
Dillon Dugan	Jonathon Berman	Dodgen Middle School	3.75	5.35	9.1	Scientific Achievement Award	Simmering, Large Crystal Title
Arya Kurup	Dhanya Patur	Dodgen Middle School	4.9	4.15	9.05	Honorable Mention	Amazing Participation

Emily Ginzberg	Tanvi Bhandurge	Dodgen Middle School	2.5	6.4	8.9	Honorable Mention	Amazing Participation
April Zhang	Claire Xu	Dodgen Middle School	5.2	3.6	8.8	Honorable Mention	Amazing Participation
Debmita Roy	Brantley Grooms	Dodgen Middle School	3.8	4.8	8.6	Honorable Mention	Amazing Participation
Christopher Neal	N/A	Dodgen Middle School	5.18	3.35	8.53	Honorable Mention	Amazing Participation
Kavin Mukilan	N/A	Dodgen Middle School	5.75	2.7	8.45	Honorable Mention	Amazing Participation
Maddox Lyon	Thomas Ellison	Dodgen Middle School	5.9	2.23	8.13	Honorable Mention	Amazing Participation
Jose Vazquez	Gus Fleming	Dodgen Middle School	7.2	0.85	8.05	Honorable Mention	Amazing Participation
Andrew Zhang	Christopher Zhou	Dodgen Middle School	5.25	2.75	8.0	Honorable Mention	Amazing Participation
Jeremy Shu	John Paul Decker	Dodgen Middle School	5.3	2.65	7.95	Honorable Mention	Amazing Participation
Deeta Doddi	Anya Dhir	Dodgen Middle School	2.95	5.0	7.95	Honorable Mention	Amazing Participation
Josh Bengtson	Jaiden Huynh	Dodgen Middle School	4.91	3.0	7.91	Honorable Mention	Amazing Participation
Hayden Weaver	Wayde Burke	Dodgen Middle School	4.88	3.0	7.88	Honorable Mention	Amazing Participation

Abhijeet Ghosh	Ratvik Ranjan	Dodgen Middle School	3.68	4.0	7.68	Honorable Mention	Amazing Participation
Anna Lopez	Sarah Law	Dodgen Middle School	4.7	2.9	7.6	Honorable Mention	Amazing Participation
Emily Nilles	Elle Ides	Dodgen Middle School	4.8	2.25	7.05	Honorable Mention	Amazing Participation
Jacob Thottungal	Quentin Brown	Dodgen Middle School	4.35	2.68	7.03	Honorable Mention	Amazing Participation
Eden Herring	Sahara Shetty	Dodgen Middle School	6.0	1.0	7.0	Honorable Mention	Amazing Participation
Ansley Gorton	Brooke Leslie	Dodgen Middle School	6.85	0.0	6.85	Honorable Mention	Amazing Participation
Evan Herrera	Justin Ho	Dodgen Middle School	4.45	2.4	6.85	Honorable Mention	Amazing Participation
Jake McNeely	Tomoki Sato	Dodgen Middle School	4.0	2.65	6.65	Honorable Mention	Amazing Participation
James Peterson	Ayan Patel	Dodgen Middle School	3.9	2.6	6.5	Honorable Mention	Amazing Participation
Issac Waldron	Mason Wicks	Dodgen Middle School	5.1	1.4	6.5	Honorable Mention	Amazing Participation
Cole Spankowski	Jackson Williams	Dodgen Middle School	6.4	0.0	6.4	Honorable Mention	Amazing Participation
Emmet Cronin	Chase Holland	Dodgen Middle School	4.95	1.45	6.4	Honorable Mention	Amazing Participation

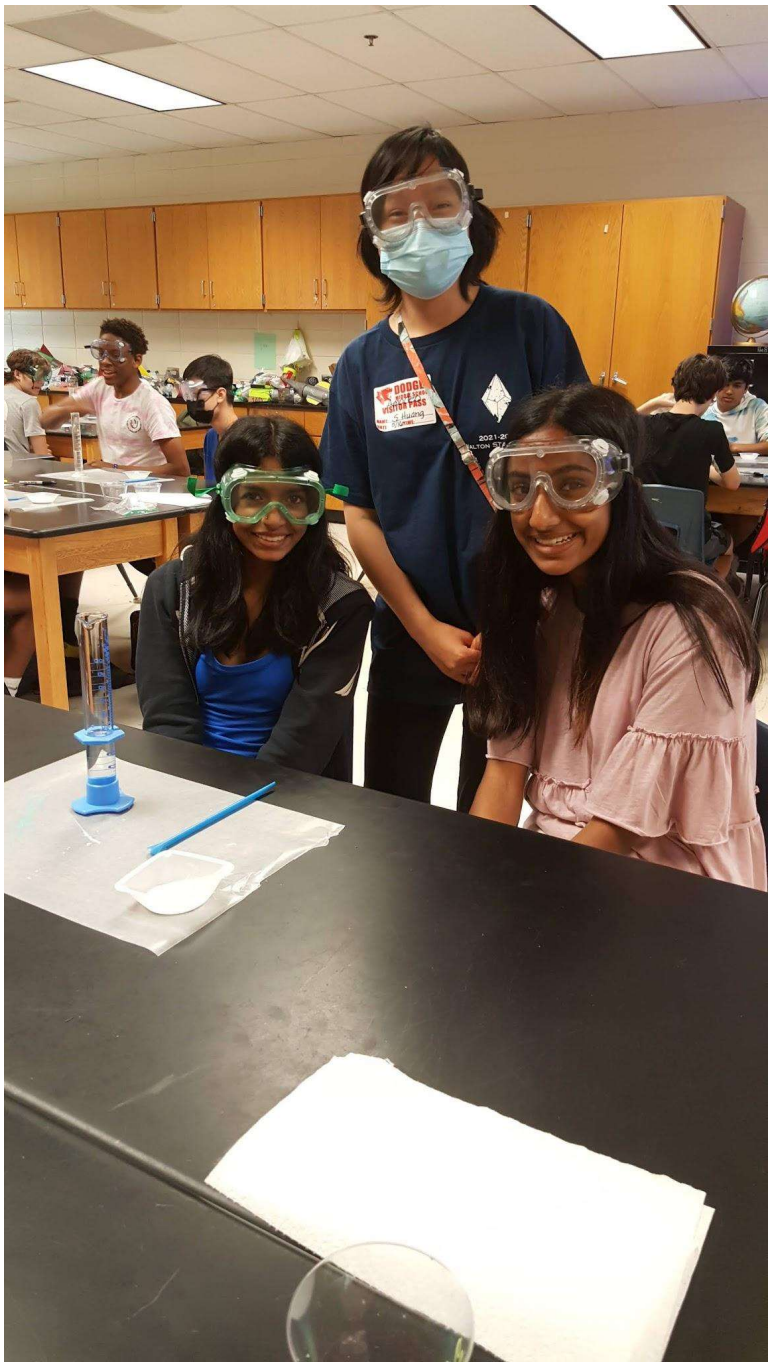
Noah Rogers	Coleman James Fleury	Dodgen Middle School	4.6	1.45	6.05	Honorable Mention	Amazing Participation
Rohil Vallabhaneni	Miller Guy	Dodgen Middle School	1.75	4.05	5.8	Honorable Mention	Amazing Participation
Brandon Smith	Daniel Walker	Dodgen Middle School	2.75	2.8	5.55	Honorable Mention	Amazing Participation
Logan Wicks	N/A	Dodgen Middle School	2.25	2.75	5.0	Honorable Mention	Amazing Participation
Maxim Le-Tu	Thomas Callahan	Dodgen Middle School	0.0	4.3	4.3	Honorable Mention	Amazing Participation
Jeremiah Raj	Matthew Sha	Dodgen Middle School	3.0	1.0	4.0	Honorable Mention	Amazing Participation

Photos of the two activity days with Mrs. Amodeo's students:

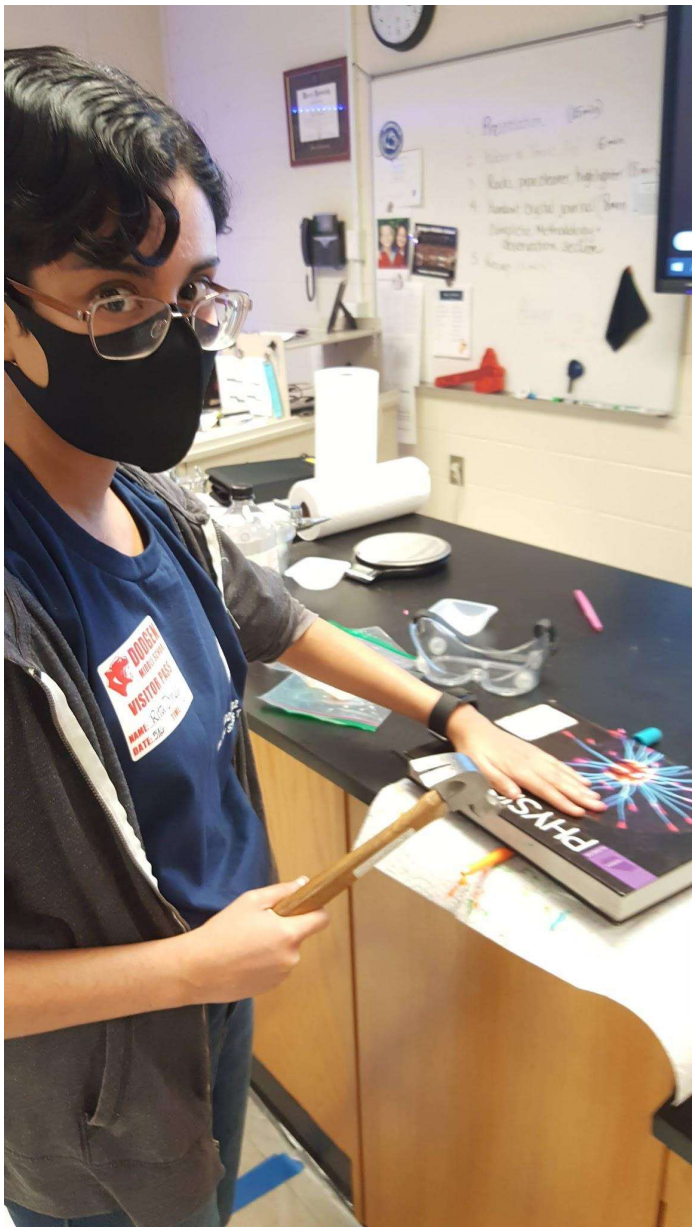
May 16th, 2022: Day 1

Preparing the Aluminum potassium sulfate for the students.

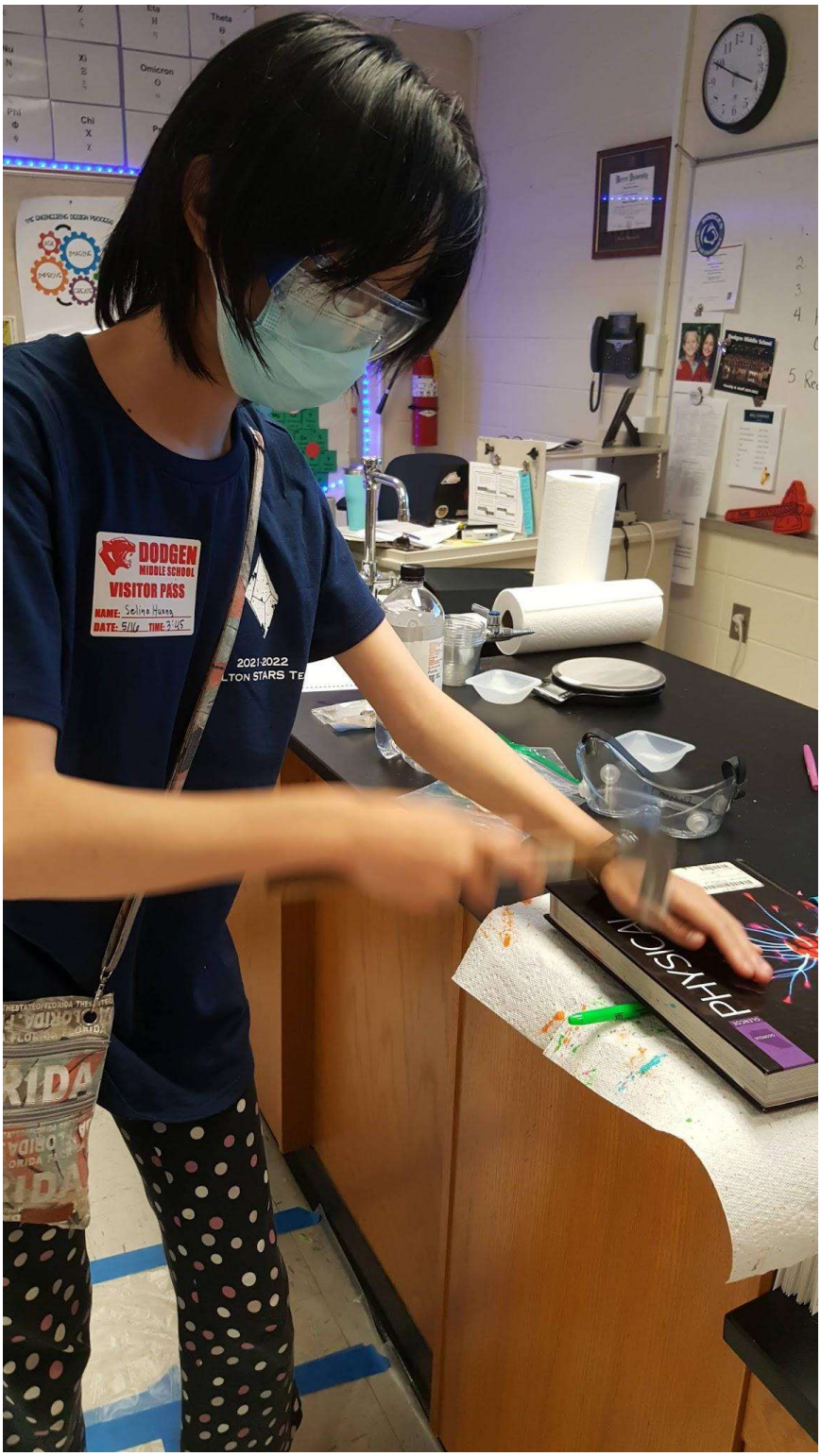
Teaching students about the differences between undersaturated, saturated, and supersaturated solutions.



Getting ready to grow some crystals.



Busting highlighters so that the students can have highlighter inks for their glow-in-the-dark crystals.



Busting more highlighters for students.

STARS officers posing with some of the crystal-growing solutions the students set up that day.

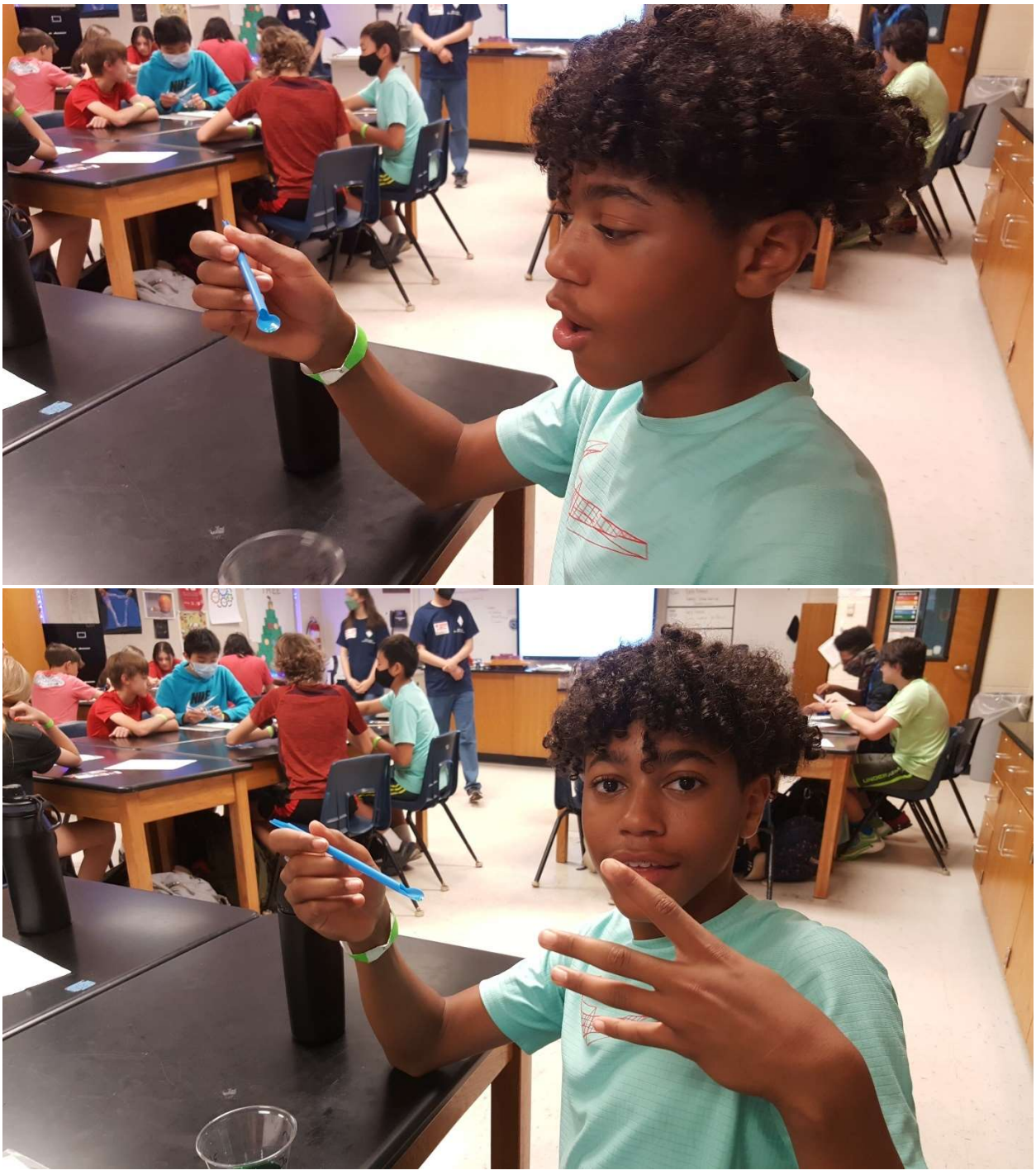
A group photo with the 7th period class.

A great first day of crystal-growing.

May 20th, 2022: Day 2

Getting ready.

STARS officers presenting crystal-growing information and techniques to the students.

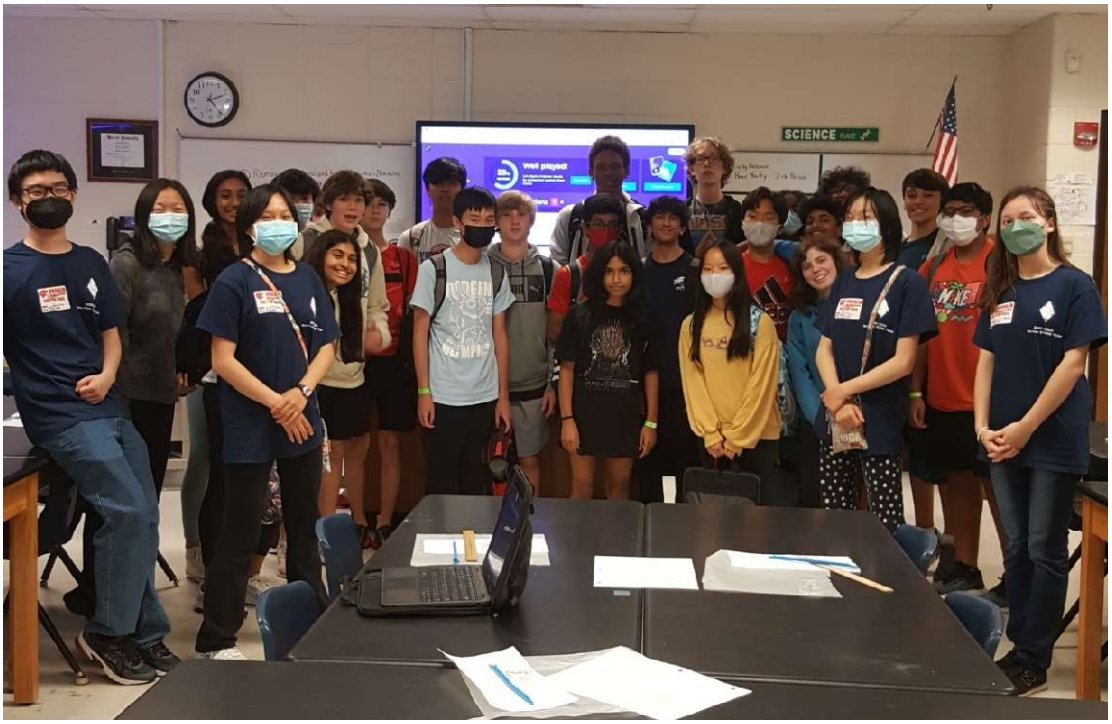


Students being excited to see crystal growth.

STARS officers posing in front of the classroom.

The king-sized candy for the mega Kahoot winners.

Playing mega Kahoot to test the students on what they remember about crystal-growing.



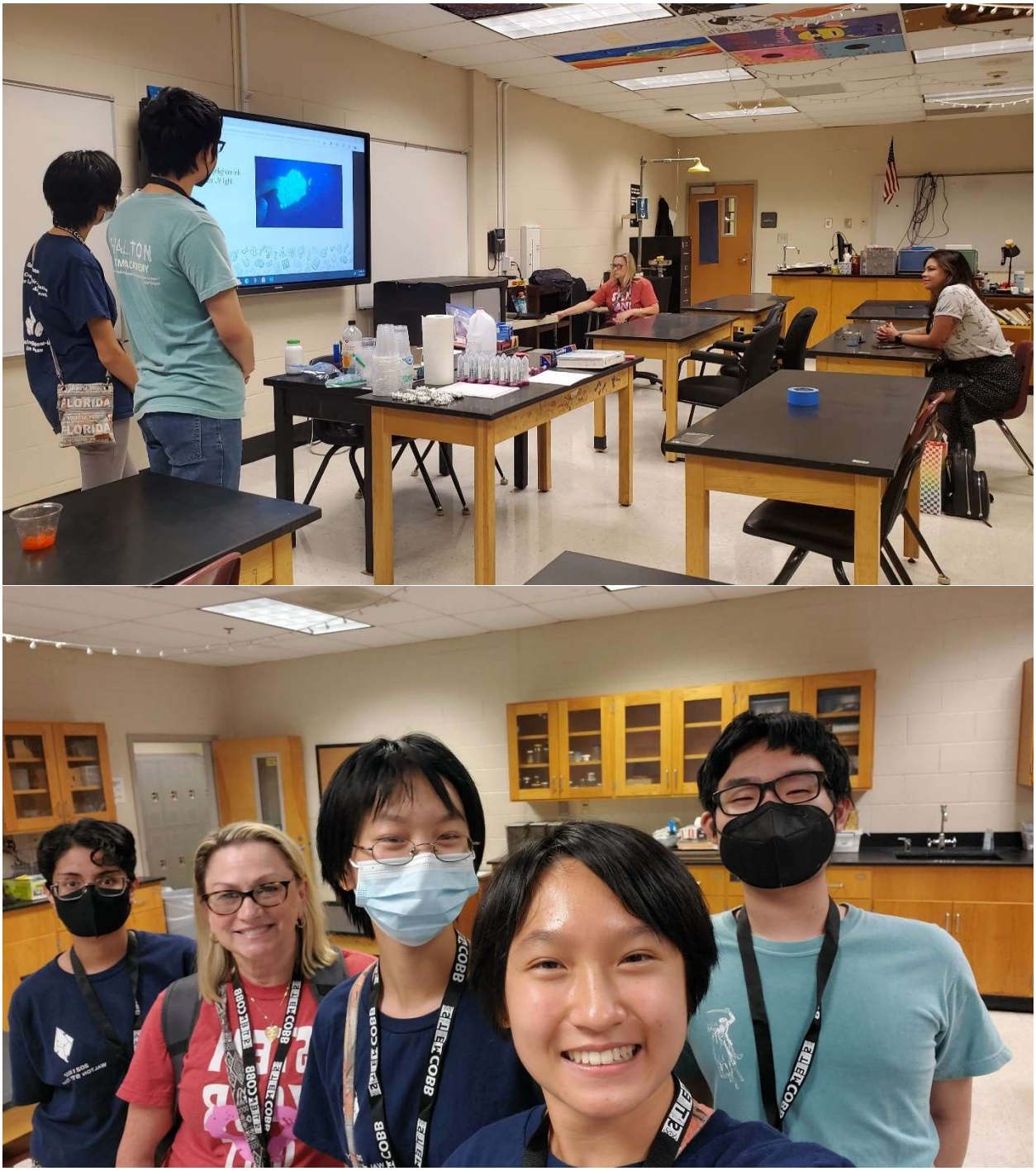
A great crystal-growing day.

June 15th, 2022: Cobb County STEM teacher conference (2022 STEMapalooza)

Preparing crystal-growing take-home kits for the teachers who will be at our oral presentation session at the 2022 STEM teacher conference (STEMapalooza)

STARS officers preparing the crystal-growing kits.

STARS Officers presenting to STEM teachers at the 2022 STEMapalooza conference about STARS crystal-growing competitions.



2022 STEMapalooza (from left to right: Rita (STARS officer), Mrs. Amodeo (Dodgen 8th grade advanced physics teacher who collaborated with STARS), Selina (STARS officer), Susanna (STARS officer), and Andrew (STARS officer))

Link to a recorded section of the presentation: https://youtu.be/bRNHyuwZ7Mg

March 24th, 2023: Awards Ceremony

Giving out a Medal of Scientific Excellence.

Group photo of competition winners.