

News from the field of the premiere DoD Youth STEM education program.

Senator Mitt Romney's Northern Utah Director Visits STARBASE Hill

Support for DoD STARBASE from Senators brings benefits to the serving state, the surrounding school districts, and the participating students alike. Visits from U.S. Senators and their staff provides another form of STEM education, as those touring the STARBASE facilities often possess no familiarity with the incredible ability the STARBASE program has to enhance students' enthusiasm and knowledge in subjects such as Chemistry, Physics, and Robotics.

STARBASE Hill recently welcomed Mr. Chandler Beutler, the Northern Utah Director for Senator Mitt Romney. STARBASE Hill thrives on visitors touring the academy and introducing them to the STEM interactive world provided free of charge to their families, friends, neighbors, and constituents. During Mr. Beutler's interactions in the classrooms, words such as "AWESOME," "AMAZING," and "INCREDIBLE" frequently exited his mouth. Enthralled throughout his visit, Mr. Beutler designed his own lab module, engineered a successful restraint system for Robin (the story of Batman and Robin is used for Eggbert's mission from the moon), and witnessed the students' drive to colonize Mars through the use of robots. He even had the opportunity of sporting his Sphero skills by manually controlling it through the teachers' office.

Burch Creek Elementary from Ogden, Utah attended while Mr. Beutler journeyed through the academy. Their participation afforded Mr. Beutler the opportunity to interact with the students and understand why they love STARBASE Hill. Upon leaving the classroom after successfully saving Robin in the Bat Shuttle, the class gave him an amazing round of applause for his efforts in keeping the raw egg intact. In the robotics class, students explained the important part robots will take in the humans' challenge of colonizing "The Red Planet." The students' connection of discovered concepts and principles to the world's STEM opportunities intensely exhibited to Mr. Beutler the impact STARBASE Hill makes on 5th-8th grade students alike.

(Continued on Page 2.)



"To succeed in this new information-based and highly technological society, students need to develop their capabilities in STEM to levels much beyond what was considered acceptable in the past." -- National Science Foundation

(Continued from Page 1.)

Mr. Beutler's tour and participation in the academy enhanced the reach of STARBASE Hill to Utah's legislative branch. Increasing the notoriety of STARBASE Hill orchestrates greater support for students who lack opportunity in and knowledge of the STEM arena within Utah and beyond. With a STARBASE Hill coin in hand, Mr. Beutler now carries the enthusiasm and understanding for STARBASE Hill. His mission, challenge Senator Romney and other staff members to utilize the Engineering Design Process to successfully save Robin and express to his contacts the undeniable importance of STARBASE Hill to the students of northern Utah.



STARBASE Robins's Zeineb Yousif

Former Student Now STARBASE Staff

Zeineb Yousif attended the STARBASE Robins program in February 2002 with Ms. Birdsell's class from Miller Elementary School. She remembers that her favorite part about STARBASE was being able to leave school and go somewhere fun to do hands-on activities. Some activities she remembers doing are Eggbert and Newton's Laws of Motion. Her favorite lesson was building and launching her own model rocket. To this day, she still has her Star Cruiser rocket from twenty years ago!

Prior to joining STARBASE Robins, Zeineb taught all subject areas in kindergarten, first, and second grade over the course of five years, but she never had the opportunity to implement STEM principles into her classroom. After leaving the school system, she wanted to continue teaching by making an impact in a different way.

When she discovered the job posting online for a STARBASE Instructor, she remembers having attended the program herself. She also recalled the times her former students would stop by her classroom to tell her about their day at STARBASE and all the amazing experiments they had done. Because of these specific memories, Zeineb decided to step out of her comfort zone by teaching STEM to older students. Being back as an instructor has shown her the importance of this program and how it significantly impacts students and prepares them for the future.

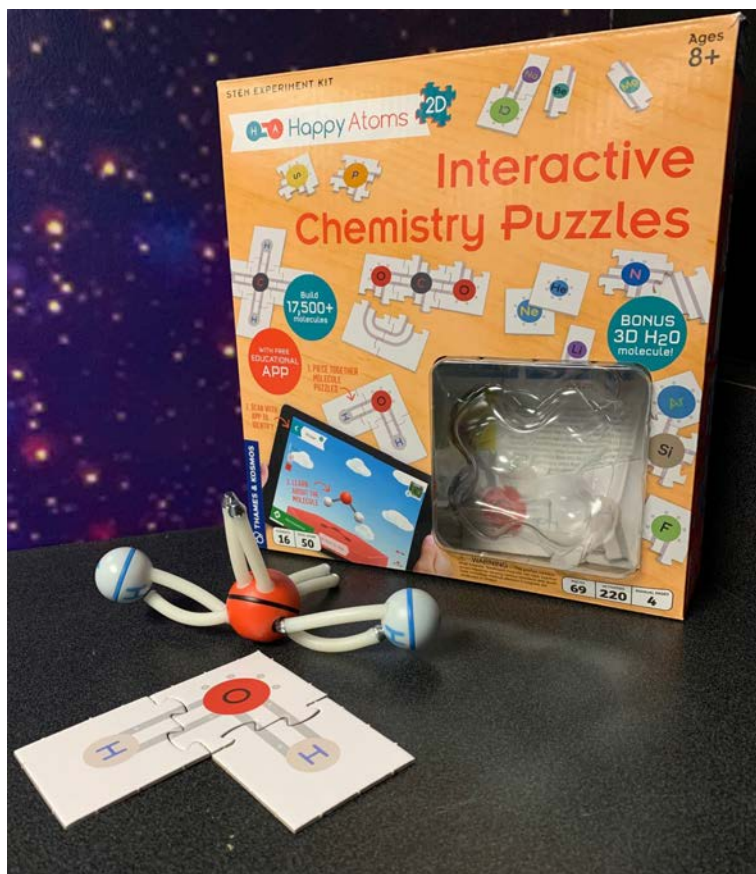


STARBASE Minnesota-St. Paul and Happy Atoms

As the pandemic set in during the spring of 2020, the instructor team at STARBASE Minnesota-St. Paul focused on how to safely provide a hands-on STEM program, while abiding by required COVID protocols such as social distancing and limited use of shared materials. The instructor team worked together to review the curriculum and brainstorm how to make lessons accessible to students in a COVID-safe model.

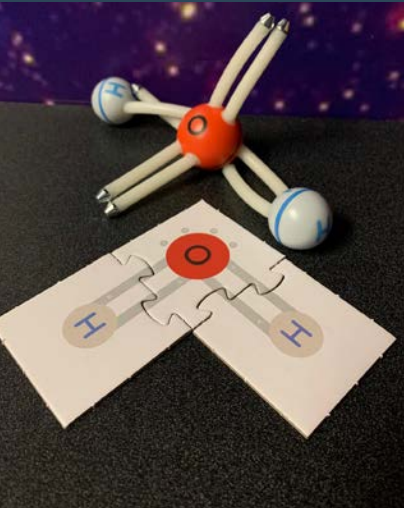
As the instructor team focused on the lesson, Creating and Building Molecular Models, everyone recognized that the Happy Atoms app could make this lesson safely accessible to students, but the challenge was getting the physical atoms in the hands of students without sharing the same atom models to meet protocols. The STARBASE Minnesota instructor team wondered if it would be possible to create a flat, 2D paper version of Happy Atoms as a COVID-safe replacement to the 3D atoms.

Applying the engineering design process to this real-life scenario, the STARBASE Minnesota instructor team began developing prototypes of a 2D version of Happy Atoms. Close investigation of the Happy Atoms app verified that the app scans 3D molecules for color signatures. Based on the colors, the app determines the type and quantity of each atom included in a molecule. After some testing, it didn't seem to matter if the atoms themselves were 2D or 3D for the app to correctly scan the colors. The STARBASE team then drafted a set of 2D introductory molecules reflective of the diameter and color of the 3D version.



(Continued on Page 4.)

(Continued from Page 3.)



It was time to reach out to Thames and Kosmos, the company that produces and sells Happy Atoms. After explaining the need for a 2D application, a Happy Atoms representatives from Thames and Kosmos; Schell Games, creators of the Happy Atoms app; and STARBASE Minnesota met via Zoom, discussed the issue and then received their permission to create and print a 2D version of Happy Atoms to distribute in summer STEM kits and to use with schools in the fall of 2020. Thames and Kosmos also shared specific color information for each atom to make the colors as close as possible, and in return, STARBASE Minnesota agreed to report back to Thames on Kosmos and Schell Games on the effectiveness of the 2D version of Happy Atoms.

STARBASE Minnesota moved forward with production of the 2D version of Happy Atoms, including them in summer 2020 STEM kits and those utilized by students in fall 2020 STARBASE programming when COVID-19 protocols were still in place. The results were extremely positive. Students and teachers loved using the Happy Atoms app and the 2D atoms as manipulatives. In a follow-up meeting with Thames and Kosmos and Schell Games, STARBASE Minnesota reported back these positive results. When asked about any challenges with the 2D version, STARBASE Minnesota shared that while the bonds were shown in the app, there wasn't a way for students to bond the atoms using the 2D version.

Fast forward to fall of 2021, Thames and Kosmos reached out to STARBASE Minnesota to send a free set of their new 2D version of Happy Atoms, now in their production line of products that they sell. Thames and Kosmos had taken the feedback from STARBASE Minnesota and designed a 2D version of Happy Atoms that included a way for students to bond the atoms and made the introductory set of atoms available in a 2D version at a lower price point than the 3D version, making it more accessible and affordable for the education community and for families. Both versions are compatible with the same Happy Atoms app.

Thames and Kosmos is appreciative of programs like DoD STARBASE who are dedicated to putting STEM in the hands of students. In fact, in appreciation, they would like to share a free set of 2D Happy Atoms kits with all STARBASE sites. Please reach out to sales@thamesandkosmos.com to receive a free 2D version of Happy Atoms.

A Call for Participation

Throughout the year, this newsletter will continue to spotlight the achievements, partnerships, and tips of the participants of the DoD STARBASE program. Please share your achievements, success stories, and helpful tips with us at email@dodstarbase.org.

STARBASE Los Alamitos Earns Innovation Award at World's Largest Student Rocketry Contest

A modular carbon fiber rocket designed by students from STARBASE Los Alamitos was recognized as the most innovative project flown during the 2022 American Rocketry Challenge National Finals at Great Meadow in The Plains, Virginia.

As students, ages 14-17, left the east coast to head back to the STARBASE campus on Joint Forces Training Base, Los Alamitos, they carried with them Raytheon's Most Innovative Approach to Mission Award along with a \$500 cash prize to be split among the eight team members.

In a competition that brought together 99 of the country's best middle and high school age rocketry teams – culled from more than 720 qualifying programs – and tested their ability to design, build and launch a model rocket to loosely defined engineering specifications and fixed accuracy goals, the all-black rocket with interchangeable parts drew attention from contest judges throughout the day.

Edwin and Barbara Pill, National Association of Rocketry members who served as the contest's special events judges, took notice of a slotted removable fin canister the team used to provide easily adjustable control and stability for their rocket. Neither had seen a removable fin design on a Challenge rocket before.

"That was impressive because it's something you can [use to] change the size of the fin or you can change a broken fin without having to cut it out," Barbara said.

Typically, a fin adjustment or replacement requires cutting out a replacement and gluing it to the rocket's body which leaves the rocket unflyable while the epoxy dries, Edwin said.

"All they had to do was basically fly it, see what they got, and then change the fins to make them smaller or larger," he said. "It was a quick change, like a speed-loader, so they weren't down very long to change and adjust what they needed. That was very innovative."

Beyond the fin design, the Pills also were impressed by team members' ability to answer questions related to their rocket design and the process of building with carbon fiber.

"They all knew how they built the rocket," Barbara said of the team members. "They all could explain how they built the carbon fiber. These kids they figured it out, read up on it, watched YouTube or whatever, and they did all the work themselves."

(Article Borrowed From: <https://grizzly.shorthandstories.com/starbase-los-alamitos-youth-rocket-team-earns-innovation-award/>)





2022 STARBASE Virtual Workshop Monday, July 25th & Tuesday, July 26th from 1:00-4:00pm EDT Daily

As you know, this year's annual DoD STARBASE Directors Workshop will be held virtually Monday, July 25th and Tuesday, July 16th from 1:00-4:00pm EDT. A linked schedule is available in STARBASE-U in the Directors Workshop course.

Some of the topics to look forward to include a STARBASE training update, more information about the new property management expectations, and updates about the curriculum!

Recent Curriculum Publications

The STARBASE Curriculum Advisory Group is excited to announce that new lessons and activities have been published in the following areas:

- Science**
 - A. *Energy Explorations* has three new activities to provide even more opportunities for students to learn about how energy works in the world around us.
 - D. *Introduction to Circuitry & Appendix B. STARBASE Simple Circuits* are now both available in the Science D. Science Explorations section of our curriculum.
- Technology**
 - A. The *Introduction to Simulation* parent lesson has been published. Appendices for this lesson are in development and should be published shortly.
 - A. In a step toward examining the world of renewable energy, the *Introduction to Renewable Energy* parent lesson and an appendix that looks at *Wind Energy* specifically are now available. Two more appendices that consider fuel cells and solar energy are in development.
- Math**
 - C. At the time of the publication of the latest Standards, Objectives, and Activities (SOA), the SCAG had planned to develop a Basic Geometry lesson plan that echoed the hands-on approach taken by Basic Measurement and Basic Graphing. Since then, things have evolved. In the Geometry sub-category, you can now find three lesson plans that incorporate the activities you know and love: *Area & Volume Activities*, *Coordinate Planes Activities*, and *Exploring Angles*. There are several new activities as well!

