Country Focus: USA

On 18 January and 1 February 2020, ITEN teacher leaders Carmen Barnes and Michelle Hodges of Arizona, USA, facilitated two workshops for early childhood teachers who want to integrate STEM into their teaching. STEMteachersPHX in Phoenix and the STEMAZing Project in Tucson hosted the workshops.

The institutional team from Arizona **serves the local and international teaching community**, collaborating with teachers from **Tucson** and **Phoenix**, Arizona (USA) in addition to **Honduras**, **Jamaica**, **Mexico**, and **Trinidad and Tobago**.

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Teachers

...participated in full-day workshops in Phoenix and Tucson to get their hands "dirty" with STEM as they learned about a variety of physical concepts, including magnetism and air pressure.

Michelle Hodges (left) and **Carmen Barnes** (left) are early childhood teachers who are dedicated to introducing STEM to boys and girls in the earliest years of their formal education. **DaNel Hogan** (right) has supported their work by organizing these events as the director of the STEMAZing Project.

Michelle notes that "These workshops...show teachers **how easy STEM integration can be**!"

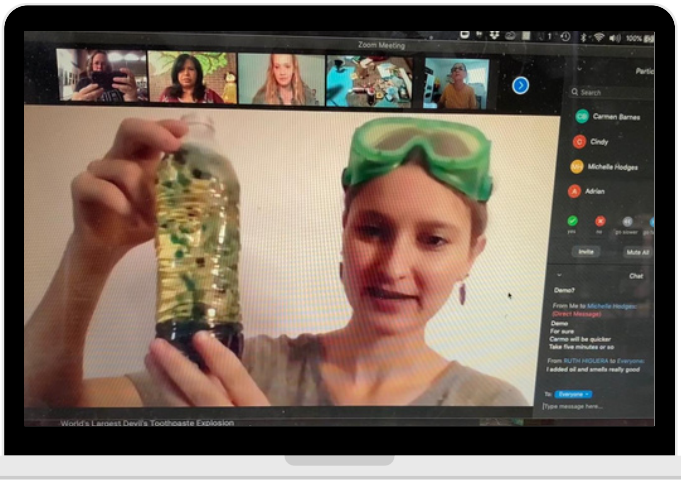
Carmen Barnes was recently recognized by the University of Arizona Women in Science and Engineering Program for her incredible contribution to **Excellence in K-12 STEM Education for Gender Equity**. The way Carmen engages students in her kindergarten/first grade classroom at the IDEA School in Tucson with high quality hands-on, minds-on lessons is being shared with every educator she works with through her leadership roles.

"My greatest accomplishment is being able to see the fruits of my labor when I go and see each teacher in their setting and get to see those teachers implementing the lessons we taught them. The joy that the children express when they are participating in STEM activities is more than enough reward for me." - Carmen

Through her work with both English- and Spanish-speaking educators, Carmen is undoubtedly encouraging more girls to develop strong STEM identities by empowering their teachers to engage them with enthusiasm and confidence.

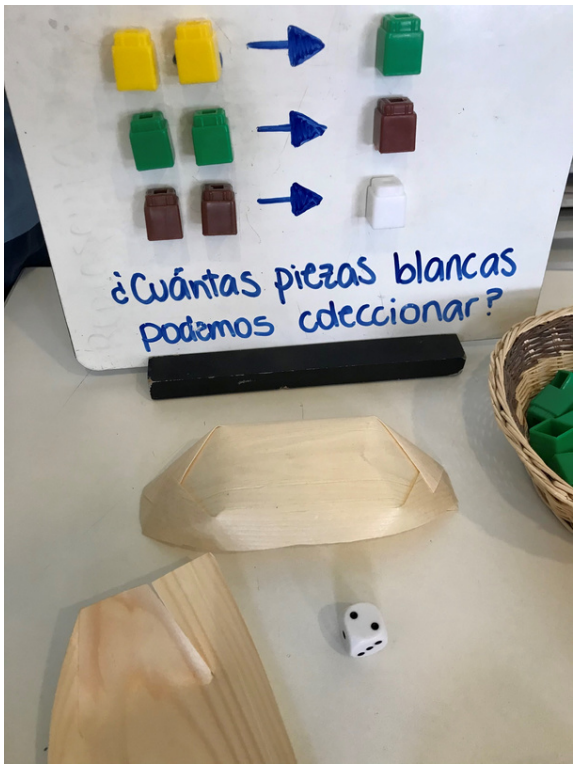
To complete the Seed Grant project initiated earlier in the year, two additional workshops with the same teachers from Phoenix and Tucson took place virtually on Saturdays **November 7 and 21, 2020**.

Teachers received a **STEMAZing kit of supplies and books to support teaching the simple machines and chemistry lessons.** The lessons included paper clip levers, make-your-own water screws, elephant toothpaste, lava lamps, fizzy art, and more!



During the virtual workshop, teachers are equipped to do hands-on activities, just like they would have done in-person. These activities helps teachers understand how easy it can be to do science in the classroom, even or for families to take part in the activities in their students' own homes!

In addition to the **series of workshops** spanning the 2020 year, the leaders provide **coaching** and **mentoring** support, and **peer-to-peer collaboration**, all based on the a **STEMAZing pedagogy and methodology.** The goal is to help early childhood teachers to be empowered as STEM teachers and facilitate their transition into teacher leaders.



What does being a STEM teacher leader look like?

One characteristic of being a STEM teacher leader means thinking outside of the box, making connections, and sharing inspiring ideas with others. In the vignette below, **DaNel** describes how she and **Carmen** developed an innovative math game inspired by an experience they had in Peru:

When **Carmen Barnes** was participating in Fellowship activities in Lima, Peru in August 2019 and touring schools with other ITEN Fellows, **she had the pleasure of visiting Colegio Áleph** (http://colegioaleph.edu.pe/).

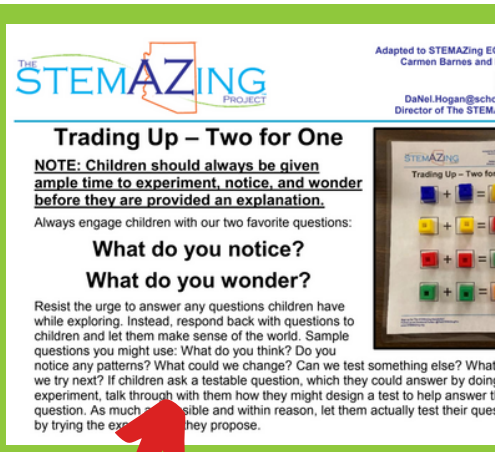
While she was there, **a four-year old student taught her a game where you roll a die, collect that number of cubes in the first color on the board, and then trade them up in a two-for-one conversion to the next colors**. She literally took the photo (above, right) of original trading up game from Peru, and that was it. She never had a chance to chat with the other teachers at Áleph about it.

Carmen brought the game back to Tucson, Arizona, and used it in its original form with her students at the IDEA School.

Fast forward to late 2020 ago when Carmen was adapting this game into the STEMAZing lesson plan template. As we were working on it together, **I noticed this simple game to practice math is actually the foundation of the binary number system**.

What started with that initial interaction in Peru is now the 31-page lesson which incorporates more direct connections to the binary number system, converting other base numbers including base ten, and converting U.S. coins (a suggestion made by one of Carmen's community of practice members during our meeting a few weeks ago).

It starts very simply and can be used with students who are much older. There is also now a binary number game embedded in the lesson too.


THE STEMAZING PROJECT

Trading Up – Two for One

NOTE: Children should always be given ample time to experiment, notice, and wonder before they are provided an explanation.

Always engage children with our two favorite questions:

What do you notice?

What do you wonder?

Resist the urge to answer any questions children have while exploring. Instead, respond back with questions to children and let them make sense of the world. Sample questions you might use: What do you think? Do you notice any patterns? What could we change? Can we test something else? What we try next? If children ask a testable question, which they could answer by doing experiment, talk through with them how they might design a test to help answer t question. As much as possible and within reason, let them actually test their ques by trying the ex… they propose.

Click here to check out the lesson!