

The Brightest Star

Raquel Redshirt is heating up her community with solar ovens

by Amanda Bahe

A stack of cardboard boxes is tucked away in a corner of the family home in Shiprock, N.M. Each of the 10 or so boxes is a solar oven prototype engineered by Raquel “Kelly” Redshirt using simple materials found around the house.

Kelly is a sophomore studying environmental engineering at the University of Oklahoma in Norman, Okla., and she is on a mission to give back to Navajo families by providing a cheap and sustainable way of cooking.



Raquel Redshirt's stack of various solar oven prototypes.
// Photo by Amanda Bahe

It all began one Christmas, as Kelly and her family gave up their traditional holiday dinner in order to deliver trays of baked goods to families in their community. Then only eight years old, it was Kelly's first time meeting families who did not have access to electricity and running water.

“At that moment it just made me think,” she said. “Is there a way to get by [cooking food] without spending money on electricity?”

Seeing the families without a Christmas dinner inspired Kelly to begin researching a solution.

Much of her early research returned expensive results – solar ovens costing hundreds of dollars and requiring material not easily accessible in her rural town.

She turned the lack of effective results into a middle school science fair experiment, designing her own solar oven created with the help of her parents using only materials that Navajo families had easy access to. Her cultural background guided her engineering, even using sheep wool as a source of insulation for some of her oven prototypes.

The experiment continued into high school where she became an Intel International Science Engineering Fair winner. In 2014, Kelly was a featured TEDxABQ speaker in Albuquerque, N.M., where she explained how her project can change the lives of people in her community.

Kelly's next steps involve science education and perfecting her oven prototypes. She wants to teach people about the benefits of solar cooking and begin distributing ovens to families still living without electricity.

After college, Kelly hopes to work for an engineering



Redshirt, Diné, has been making solar oven prototypes since she was in middle school.
// Photo by Amanda Bahe

firm to gain experience before returning home to work on environmental issues. She hopes to use her education to help protect the environment and land that, she says, we are borrowing from our children.

“This land is ours right now but there's still future generations to come and they have to use the land also,” Kelly reminds us.

ADVICE TO THE YOUTH

“It is important that we continue our education,” Kelly says. She encourages youth to get out of their comfort zones in order to break down stereotypes and create change.

How does a solar oven work?

Solar ovens use the free energy from the sun to power their cooking. They are usually made from boxes that are built to trap heat. In Kelly's solar ovens, aluminum foil reflected the sun's rays evenly throughout the box to make it hot.

She used different forms of insulation to keep the heat inside the oven and a piece of glass on top to let the sun inside.

By inserting the food and closing the glass lid, the heat from the sun is kept inside the box, cooking the food just like an electrical oven!

Did you know...

One benefit of solar cooking is that more of the food's nutrients are preserved because it is cooked at a lower temperature over a long period of time.

Does it REALLY work?

Yep! Kelly and her family have used her solar ovens to prepare family meals. They cook different types of meat, including mutton, a Navajo delicacy.

The ovens are easy to use because all you have to do is put your food in, go about your business, and come back minutes or hours later (depending on what you are cooking) and return to a fully-cooked meal.

Take Action!

Think about your home. Are there materials you might be able to use to build your own oven? Use Kelly's approach of doing research to begin your own project. For a place to start, visit: <http://climatekids.nasa.gov/smores>.