

RCSI

Rural Communities STEM Initiative

A business and education partnership between Roane State Community College, regional businesses, and nine East Tennessee rural school districts, to improve STEM education.



RCSI helps students 'Capture the Rainbow'

Eighth grade science teacher Tori Henley knows what to expect when she presents "Capture the Rainbow," a Lab-in-a-Box activity she received free from the Rural Community STEM Initiative and Roane State Foundation five years ago.



The experiment leads students to analyze the pH of a solution by watching it change color.

"It's one of their favorites. They say, 'Oh, that's so cool! It's changing color!' They get super excited about it. Most middle school kids are visual learners," she said. "If they can do it hands-on, they tend to understand it better."

Using a universal pH indicator in a solution, students add Alka-Seltzer tablets to it, Henley said. "They see the colors start to

(Continued on page 2)

NEW Lab-in-a-Box Resources for 2017:

Fossils – Study 24 real fossils of extinct organisms. Includes fossils, identification book, magnifying glass, instructions and handouts. Developed by Dr. Arthur C. Lee, Roane State Community College.

Frictional Forces – Explore forces of friction in everyday life, measuring surface smoothness. Developed by Dr. Phillip Hyun, Roane State Community College.

Robotics – Build a table-top robot, and program it to perform a variety of tasks. Developed by Gordon F. Williams, Roane State Community College.

Donations for Lab-in-a-Box resources can be made via the Roane State Foundation, 865-882-4507.

Rainbow (continued)

change from purple to blue, to greenish, to slightly yellow,” she said. “Toward the end of the experiment they see it flash to red, showing the vinegar is an acid. And then they goes back to being relatively neutral again.”

The Capture the Rainbow Lab-in-a-Box contains four different cylinders of three sizes each, a beaker, funnel, stirring rods, rubber gloves, safety glasses, a universal indicator solution, sodium hydroxide and vinegar. The total value of the box is close to \$700, and the Roane Foundation replenishes supplies each year.

“Without the Lab-in-the-Box...I would not be able to do this activity with my class,” said Henley. “If I had to do this myself, it would cost several hundred dollars. That’s more than I get in one year to stock my whole classroom!”

“Honestly I think it’s a great program, I’m glad Roane State introduced it and so many local organizations have funded it. I am very grateful that they have the interest in supporting us that they do, it really does help us.”



Lab-in-a-Box resources are provided free to schools, funded by donations from local businesses and community partners.



Roane State Community College offers free teacher training each summer on how to use Lab-in-a-Box resources.

Did students like Lab-in-a-Box?

“Yes, because I got to interact with stuff in the activity.”

“Yes. It wasn’t boring and everybody had a job.”

“Yes. We got to do something fun instead of just writing.”

“Yes, because it was a fun way we could get involved and actually learn as well.”

- Comments from a 2014 survey of students

What teachers say about Lab-in-a-Box

We teachers see a lot of new resources, but it takes doing it in the classroom to know if it will prove effective. With Lab-in-a-Box, I've seen those gratifying 'aha' moments, when students grasp what you're staying, every time when I use them. They're perfectly aligned to our standards. It's been a great resource for my classroom."

- Lesley Spurling, Sunbright School, 2017

"I love this lab! I displayed the minerals before and after the lab and during classroom discussion. I was surprised at the amount of interest the students showed when actually getting to handle the minerals."

– Teacher comment from a 2014 survey of Lab-in-a-Box recipients



What is RCSI?

Rural Community STEM Initiative is a partnership between Roane State Community College, regional businesses, and nine rural school districts in East Tennessee. Its goal is to improve the science, technology, engineering and math (STEM) skills of K-12 students, based on the state-wide math and science curriculum standards, and also to inspire and motivate students to excel in those subjects.

School districts participating include Anderson, Campbell, Loudon, Morgan, Roane and Scott Counties, as well as Lenoir City, Oneida and Clinton City School districts. RCSI's major initiative has been the Lab-in-a-Box resources. Developed by a team of college professors and middle school teachers, and funded by regional business donors, the Lab-in-a-Box resources were developed in subject areas that area school system directors had identified as ones in which students were not testing well.

RESULTS:

- 85% of students achieved a high level (80% or greater) of competence in state standards addressed with each Lab-in-a-Box, according to a 2014 study of the resources.
- 91.5% of students reported that they liked doing the labs. 70.9% of students responded that the labs increased their interest in science or math.

Donations for Lab-in-a-Box resources can be made via the Roane State Foundation, 865-882-4507.

Current Lab-in-a-Box Resources:

- **7th Grade Geology**, “Mineral Properties and Identification.” State Standard, GLE 0707.7.1
- **7th Grade Geology**, “Understanding the Rock Cycle.” State Standard, GLE 0707.7.2.



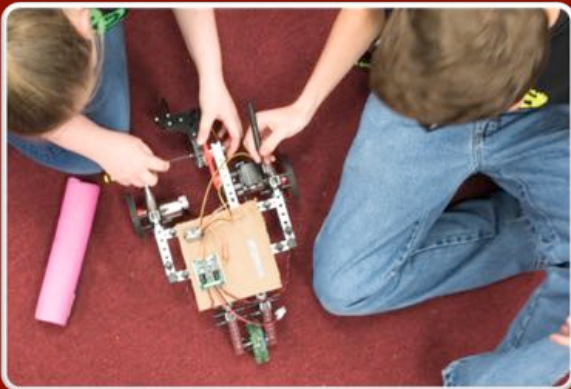
- **8th Grade Chemistry**, “Do You See What I See,” State Standard GLE 0807.Inq.4



- **8th Grade Chemistry**, “Capture the Rainbow,” State Standard, GLE 0807.9.8-9

• **NEW! Coming Soon** –Lab-in-a-Box resources in Robotics, Fossils and Frictional Forces.

4 Lab-in-a-Box resources are now available free to RCSI teachers. They are valued at \$7,500 each.



Teacher Training

Roane State Community College and Oak Ridge Associated Universities (ORAU) offer teacher training for Lab-in-a-Box resources. Watch for future training opportunities.