CRCST
Cleveland Regional Council of Science Teachers

CRCST Quarterly Newsletter

Volume LXXIII No. 1 Spring 2016

Upcoming Events:

2016 Annual Spring Symposium

Wednesday, April 20th
4:30 -7 pm

Rocky River Nature Center
24000 Valley Parkway
North Olmsted, OH 44070

Fall Conference

Saturday, November 5th
Holden Arboretum

INSIDE THIS EDITION

Greetings from Our President:

This has been a February to remember – Facebook reminded me of a picture I posted last year at this time. The old photo showed me measuring over 18 inches of snow in my back yard, but while gazing at that picture I was currently enjoying 60 degree weather! My daffodils think spring is already here – they are up about an inch. What a difference a year can make!

As a classroom teacher I took joy in knowing that February meant my morning journey to school was no longer going to be in the dark, and when I left school I could make it home without having to turn on the headlights of my car. If you take the time to look, you can see that changes, sometimes subtle, are happening.

We have had some recent changes in the realms of science as well. Chemists discovered new elements! I need to download a new periodic table, as soon as the period 7 elements are officially named. Pluto has icebergs that float in liquid nitrogen. New discoveries happen all the time!

Do you want some help in making some changes to your lesson plans? Your classroom projects? CRCST can help! On April 20th, we will hold our spring symposium at the Rocky River Nature Center, and focus on the topic of science and music. Sheela Das, from Roots of American Music will talk about how we can add music into our science class, to help convey the message in a way that might capture the interest of some students. You may even get a chance to witness one of our best science rappers in action!

Looking ahead, our fall conference is scheduled for Nov. 5, 2016, at Holden Arboretum. We will have the opportunity to experience the new canopy walk! If you haven't walked in the tree canopy before, this is an amazing opportunity to see a new view of the forest.

Looking farther ahead, save the date of Dec. 1-3 2016 for the NSTA regional conference being held in Columbus. NSTA will pull in the best science teachers in the region who will share with you their expertise. It is a great way to be reinvigorated!

Enjoy the upcoming spring, and take time to embrace the changes. I hope to see you on April 20th.

Barbara Kooser

Cleveland Regional Council of Science Teachers
Annual Spring Symposium
Rocky River Nature Center
24000 Valley Parkway, North Olmsted, OH 44070 (use street address in GPS)

Wednesday, April 20, 2016, 4:30-7 pm, light dinner included

4:30-5:00 pm	Registration, Dinner, and Networking
5:00 – 5:45 pm	Presentation, Sheela Das, Roots of American Music, speaking on "Remaking Science Education through Music"
5:45-6:00 pm	Q & A
6:00 -7:00 pm	Breakout presentations: Primary: "Writing Successful Science Songs", Sheela Das, Middle/H.S.: " Make Music with What?", Dr. John Fellenstein and Emmett Keller.

For further details, : http://ww.crcst.org
Questions: Barb Kooser bkooser@ndc.edu

CRCST Spring Symposium Registration
Please use one form per person, copy as needed
CRCST membership required

	Early bird (by April 15)	On-site
Symposium only (member)	$15	$20
1 yr. CRCST membership + symposium	$30	$35
2 yr. CRCST membership + symposium	$45	$50
3 yr. CRCST membership + symposium	$60	$65
1 yr. CRCST membership & symposium ☐ (full time education students)	$20	$25

Additional donation to CRCST: $_____

Name: _____Home phone: (___) _____

Home address: _____

City: _____ Zip: _____

School/ Work site: _____

City: _____ Zip: _____

Phone: (___) _____ E-mail: _____

Make checks payable to: CRCST, then mail to: Mark Waner, Dept. of Chemistry, John Carroll University, 1 John Carroll Blvd., University Heights, OH 44118

The University of Akron OHIO's POLYTECHNIC UNIVERSITY

Akron Global Polymer Academy
http://www.agpa.uakron.edu/

Dear Educator,

Have you heard of the Akron Global Polymer Academy (*AGPA*)? A division of the University of Akron's College of Polymer Science and Polymer Engineering, AGPA creates and distributes knowledge about polymer science, polymer engineering and STEM education. Our goal is to provide a variety of resources to educate students of all ages about polymer science and polymer engineering. For teachers, we offer a variety of inquiry-based lesson plans that can be utilized as innovative, engaging, and powerful vehicles to ignite students' interest in science. In an effort to meet the needs of professional development providers, we offer inquiry-based modules for teacher education. These educational resources are aligned to national standards for professional development, content standards, and best teaching practices.

In addition to the large amount of standards based academic content, our website also provides interactive games, informative videos, and demonstrations. Single and multi-day professional development seminars, guaranteed to spark inquiry, are offered free of charge at various times throughout the year. We can schedule a visit to your school or a field trip to campus to tour our world class facilities. Feel free to contact me if you are interested.

Lastly, I want to tell you about the Rubber Band Contest for Young Inventors. (http://rubberbandcontest.org/) Middle school students are invited to invent a device that uses rubber bands in a unique way. The contest is open to students in grades 5-8. Cash prizes are awarded to the top six entries in two categories, *Arts & Leisure*, and *Science & Engineering*. In all, over $7,000 in prize money is available, with cash awards for the four schools submitting the most entries. The contest is reinforced by one of the lessons mentioned above, and is a great way to bring inquiry to your classes!

RUBBERBANDCONTEST
FOR YOUNG INVENTORS

I hope you have a wonderful school year!

John Fellenstein
Content Specialist
Akron Global Polymer Academy
jfellenstein@uakron.edu

Akron Global Polymer Academy
http://www.agpa.uakron.edu/

Program Announcement
NSF Research Experience for Teachers Site: *Research Experience for Teachers in Polymer Engineering*
This program is funded by the National Science Foundation: *Award Number EEC-1542358*

Overview:

- Eight week summer program in UA's College of Polymer Science and Polymer Engineering
- Work with a research group in Polymer Engineering, Polymer Science, Chemical and Biomolecular Engineering or Biomedical Engineering
- Learn about fundamental engineering principles
- Translate this knowledge and experience into lessons and units for your classroom

Who Should Apply:
High School Science Teachers

When: Summer 2016
Dates coming soon.

Cost:
There is NO FEE for participation. A stipend of $8,000 will be provided to participants that attend all required days

Questions:
Please contact Dr. Kevin Cavicchi - kac58@uakron.edu or John Fellenstein – jfellenstein@uakron.edu

This RET Site will offer an intensive eight week summer research program for a total of 30 secondary STEM teachers over three years (10 teachers/year) from school districts in the Akron, Ohio area. Faculty members and graduate students from the College of Polymer Science and Polymer Engineering and the Departments of Chemical and Biomolecular Engineering and Biomedical Engineering in the College of Engineering will mentor teachers on independent research projects in the faculty members' laboratories. Teachers will also take part in professional development activities including academic and industrial lectures on engineering, field trips to local polymer industry sites, and activities focused on lesson plan development. The graduate students involved will visit the teachers' classroom during the academic year and assist in the delivery of teacher-generated lesson plans. The lesson plans will be distributed on the web. A summer workshop will be held to disseminate results of this work to local teachers. A symposium at the national American Chemical Society (ACS) conference will be held each year to disseminate the results to teachers and academic, government, and industrial scientists and engineers.

This is an incredible opportunity for high school science teachers to have first-hand experience with cutting edge research projects taking place at The University of Akron. If you are looking for a rewarding summer experience, please apply!

John Fellenstein
Content Specialist
Akron Global Polymer Academy
jfellenstein@uakron.edu

TEACHER OPPORTUNITIES

Educator Workshops at

Cleveland Museum of NATURAL HISTORY

The Science Resource Center provides professional development workshops throughout the year.

Register online at cmnh.org/educatorworkshops

Biomimicry: Integrating Biology, Creativity and Design in the Classroom – Middle and High School teachers

Monday, March 7, 2016: 4:30pm – 7:00pm
Cost: $10 SRC members; $15 non-members
What can we learn from a wood frog or a wetland? What happens when we begin to see nature as a teacher and a source of innovative solutions to the design challenges we face as people? Join educators from Great Lakes Biomimicry for an introduction to the emerging fie ld of biomimicry. Participants will be introduced to tools and resources and will experience sample lessons that inspire creativity in students as they look at nature through the eyes of architects, engineers, and designers, asking "How does nature do that?"
Location: Cleveland Museum of Natural History

The Night Sky – Teachers of grades K-2 **Wednesday, April 6, 2016: 5:30pm-7:30pm** Cost: $10 SRC members; $15 non-members

The *Night Sky* program describes and explains the many cycles observed and experienced in astronomy. We will identify the Sun, Moon, planets and the constellations that are currently visible in the evening sky and discuss their motions. You'll discover that different constellations are seen at various times of the year. You'll also observe, explore, and describe daily and seasonal weather changes.
Location: Cleveland Museum of Natural History

Connecting Earth Day to Your Curriculum – Open to teachers of all grades

Tuesday, April 12, 2016: 4:30pm – 7:00pm
Cost: $10 SRC members; $15 non-members Wondering how you could connect Earth Day to your curriculum? Come and learn some easy-to-use, hands-on, environmental activities that you can share with your class. We will practice some skills that you can use right outside your school building, whether you are in the city or have a lot of open space. Come share ideas about how to extend student learning beyond the classroom walls!
Location: Cleveland Museum of Natural History

TEACHER OPPORTUNITIES

Growing Up WILD – A Focus on Invertebrates Open to Early Childhood Educators
Wednesday, April 27, 2016: 4:30pm – 7:30pm
Cost: FREE!

Do you like science, but are not sure where to start with your preschoolers? Are you looking for ways to explore nature with your students? Come and learn new ideas and techniques that will help you teach science to our new generation of nature lovers. We will explore the Growing Up WILD curriculum guide, take an up-close look at invertebrates and learn what makes these spineless creatures unique in the Animal Kingdom.
Location: Cleveland Museum of Natural History

Reasons for the Seasons – Teachers of grades 5-8
Wednesday, May 4, 2016: 5:30pm – 7:30pm
Cost: $10 SRC members; $15 non-members

The *Reasons for the Seasons* program explains the fundamental importance of the tilt of the Earth's axis relative to its orbit in determining the seasons. We'll dispel the persistent and false notion that the distance of the Earth from the Sun is the reason we have seasons. We'll also provide examples of other planets in the Solar System that experience seasons.
Location: Cleveland Museum of Natural History

Target: Moon – Teachers of grades 5-12
Wednesday, May 25, 2016: 5:00pm – 7:30pm
Cost: $10 SRC members; $15 non-members

Target: Moon will focus on all aspects of the Moon - its origin, its ancient battered surface, tidal effects on Earth and why its appearance continually changes. We'll explain the difference between the light and dark regions of the Moon's surface and name the geologic processes that result in a variety of lunar surface features. We'll name the phases of the Moon and identify them in order of appearance, and also explain the reasons for solar and lunar eclipses.
Location: Cleveland Museum of Natural History

Star Lab Training – Open to teachers of all grades
Wednesday, June 1, 2016: 5:00pm – 6:30pm
Cost: $10 SRC members; $15 non-members

Want to bring the night sky to your students? This training session is required in order to rent our portable planetarium.
Location: Cleveland Museum of Natural History

Wade into Wetlands – Open to teachers of all grades
June 21-23, 2016
Cost: $75 members and $80 non-members

Explore and learn about different wetland environments during this 3-day field experience workshop. Bring back ideas for hands-on classroom and schoolyard demonstrations. Gain field experience as naturalists from Mentor Marsh and Lake County Soil and Water lead you through this exciting and dynamic program. Be ready to share with others how you incorporate the outdoors into your students' learning experience!
1 graduate credit will be available through Ashland University for a separate fee of $175.
Location: Mentor Marsh, Lake County, Ohio

TEACHER OPPORTUNITIES

Get Graduate Credit for Attending Scientist Lectures

Environmental Challenges Facing Plant Communities in the 21st Century:
The Holden Arboretum Scientist Lecture Series & Classroom Applications

Delve deeper into the environmental issues, conditions and challenges that impact the natural world around us. This embedded class is designed to allow you to connect what you learn during the Scientist Lectures with your classroom. You will further your own knowledge about current research by learning from experts in the field, and then research and design ways to apply this new found information in your current classroom.

Select the number of lectures you will attend (1-3). The number will determine the time you need to spend out of class researching, analyzing, planning and designing how to incorporate these topics into your current teaching assignment. There will be a follow-up session on June 8, 2016.

Visit holdenarb.org to register.

Cost: $50 payable to The Holden Arboretum
$175 payable to Ashland University for one graduate credit

The next lecture is:
Putting the World in a Blender: The Spread of Invasive Species and How It Makes The World More Similar.

Thursday, Feb. 18, 7-9 pm
Emily Rauschert, assistant professor of biology at
Cleveland State University
Detailed descriptions of lectures and dates are available at holdenarb.org

Middle and High School Teacher Professional Development

Life Through Time
SECO "Saturday" on a Wednesday!

Come and experience firsthand this Great Explorations in Math and Science (GEMS) guide, which plunges students into the unifying theme of evolutionary change. Through the exciting concept of time travel, changes over time are captured in rotating station activities that introduce students to the concepts of adaptation, relatedness and "deep time." Through the implementation of the scientific method you will be introduced to the "tree of life," and organism adaptations.
(Middle and High School). (continued on page 6)

Choose the location that works the best for you:

Feb. 24, 2016 - Cleveland Botanical Garden
April 20, 2016 - The Holden Arboretum (Includes a visit to the Emergent Tower)
SECO members $25, nonmembers $40

Take home the curriculum guide to use in your classroom, worth $35.
Earn a certificate for two professional development hours.
Holden – Register at holdenarb.org or contact Sharon Graper, sgraper@holdenarb.org-440.602.3843.
CBG - To register contact Rowenna Collins, rcollins@cbgarden.org - 216.707.2831.

TEACHER OPPORTUNITIES

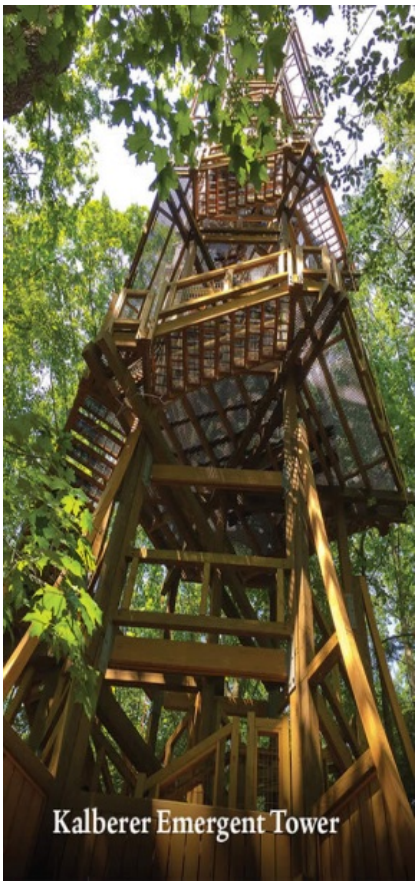
Energy Transfer: How Many Bears Can This Forest Support?

A New School Program for Grades 5-8 Utilizing the Canopy Walk

A new school program is available for schools wishing to cement their students understanding of energy transfer in an ecosystem in a hands-on manner. This new program targets the standards and concepts dealing with energy transfer that are required in grades 5 through 8. Using the native black bear as a theme students learn about these animals and their role in Ohio forests. These animals are returning to Ohio and students are fascinated by them. This 2 and 1/2 hour program explores the concepts of food chains, food webs, photosynthesis, biotic/abiotic and limiting factors. It takes place on the trails, in the forest and on our new Murch Canopy Walk. Teachers who field tested the program in the spring felt it met their curriculum needs and was a great experience for the students to learn about these concepts in a unique outdoor setting.

Schools can now register their classes for this program by calling the registrar at 440.602.3833. It is available on Mondays and Wednesdays only from April 1 until May 31 and from Sept. 1 through Oct. 31. The tour takes place in the mornings. It does not include the Kalberer Emergent Tower.
Cost : $7 per student.

Arboretum and Botanical Garden



Join Us at the Holden Arboretum. The 2016 CRCST Fall Conference will be Saturday, November 5th, at the Holden Arboretum. The day will start at 7:30AM with a continental breakfast including pastries, yogurt, selected fruit, bananas, coffee, water. From 7:30 to 8:15AM, you can visit the vendor's displays and talk with fellow teachers. The first concurrent session time will be from 8:30 - 9:15AM in the various classrooms. After a short break, we will meet to explore the new Canopy Walk starting at 9:30. The Kalberer Family Emergent Tower and Judith and Maynard H. Murch IV Canopy Walk exploration led by employees of the Holden Arboretum, will be featured this year instead of a keynote speaker. This is included free with your registration! You'll want to come back with your families and friends after visiting. These new structures allow the exploration of the forest and tree canopy and are built at 65' and 120'. From the Kalberer Emergent Tower you can see all the way to Lake Erie on a clear day. This experience will be open to our conference after the walks have closed for the season to the public. There will be a beverage break after the speaker, time to visit vendors, network and then the second concurrent sessions will start at 11:00AM. The third concurrent sessions will be from 11:55AM to 12:40PM. After that you are invited to explore the Holden Arboretum. Parking is free at the Holden Arboretum. Please come and join your fellow science teachers as we enjoy a morning of sharing information at one of our jewels of Northeast Ohio, the Holden Arboretum!

TEACHER OPPORTUNITIES

GEMS SCHOLARSHIP to NSTA

The last few years, CRCST has offered $800 awards from our GEMS account to aid in a teacher's professional development. The CRCST Board decided at the February meeting to award one of the scholarships to Stephanie Nowak from the Mentor school district. She will be attending the NSTA National Conference March 31 to April 3 in Nashville, Tennessee. Again, Stephanie will present at the 2016 Fall Conference similar to what she did at the 2015 Fall Conference.

This scholarship is awarded to a CRCST/NSTA member to be applied to the expense of attending the NSTA National Conference. The form for the 2017 year will be in the next newsletter and at the Spring Symposium in April. The 2017 NSTA National Conference will be held in San Francisco, California. The awardee(s) are expected to present at the next fall conference after Nationals and to write an article for the CRCST newsletter.

STUDENT OPPORTUNITIES

Energy Transfer: How Many Bears Can This Forest Support?

A New School Program for Grades 5-8 Utilizing the Canopy Walk

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Cost : $7 per student.

THE NEOSEF AWARDS

On March 14 -17, 2016, between 500 - 600 students will join together at Cleveland State University to demonstrate their knowledge of an area of science at the North East Ohio Science and Engineering Fair. CRCST has supported the program and the students by sponsoring 9 awards for the 7th and 8th graders every year. We give $100 Award for Biology, Chemistry, and Physics each along with $50 Award in Medicine/Health, Environmental Science, Behavioral Science, Earth Science, Computer/Math, and Engineering. Members of CRCST serve as judges and every 7th and 8th grade project gets judged on the Tuesday afternoon. We pick the best project in each division and the students find out on the Thursday evening Award Ceremony.

Susan Clay serves as the CRCST Board Representative on the NEOSEF Board. She also is responsible in finding judges for the CRCST Awards. If you are interested in helping this year, contact her at suzieclay@aol.com or at 440-570-1155. Judging will be from 3:00 to 5:30 PM on Tuesday, March 15 and all judges are invited to a judges reception at 5:30 PM. The NEOSEF is held in the gyms at the CSU Student Activities Center.

REVIEWS

A-V Review

by Cary Seidman, Science Teacher, Ruffing Montessori Schoo

Man on a Mission: Richard Garriott's Road to the Stars

Man on a Mission documents the space adventure of Richard Garriott, whose life story represents unique circumstances. His father, Owen, was a NASA astronaut. Owen's videos from Skylab, familiar to many physics teachers, demonstrated physics principles in a microgravity environment. Richard, who narrates the program, harbored ambitions to follow his father path, but a vision defect precluded his acceptance by NASA into their training program.

A compulsive techie and tinkerer as a young man, Richard was an early developer of computer games, eventually coming into great wealth as the inventor of role-playing games which sold millions of copies. After undergoing surgery to correct his vision problems, Richard set about to find a way into space. Finally, for 30 million dollars, he was able to secure a place aboard the International Space Station through the Russian space agency.

We join Garriott as he undergoes training at Star City in Russia, and this segment of the documentary provides a history of Russian accomplishments in space exploration. If for no other reason, students will benefit from learning about the contributions of Soviet scientists and astronauts toward humanity's first steps into space. Shortly before his launch, Garriott follows a Russian tradition by planting a sapling in a grove at the space center, where he visits the large tree planted by the first man in space, Yuri Gagarin, in 1961.

As launch date approaches, the film develops a natural and well-paced tension. With his father on hand to witness his journey, Richard embarks on his ISS voyage. The highlights of this part of the film are the beautiful, high resolution views of the earth.

Garriott has founded a company to privatize space travel. One hopes that the price tag for qualified and motivated civilians will become far lower than the fortune he spent on this adventure.

Book Review

by Cary Seidman, Science Teacher, Ruffing Montessori School

Kepler and the Universe, by David Love
Astronomy students know Johannes Kepler as the scientist who correctly worked out the laws of planetary motion. David Love's short (just over 200 pages) biography demonstrates that Kepler arrived at his important theories only after pursuing an entirely incorrect hypothesis, namely that planetary orbits are inscribed within the boundaries of Plato's "five perfect solids."

Love shows us that Kepler never really abandoned his belief in the centrality of the five perfect solids. Kepler's access to the observational data of Tycho Brahe gave him the raw material to set him on the path toward solving the mysteries of planetary motion. We are reminded of Kepler today whenever NASA releases information on newly discovered exosolar planets via observations made through its Kepler mission.

Although most people think of Kepler only for his contributions to our understanding of elliptical orbital motion, he also wrote what may be the first science fiction novel and studied the optics of the human eye. Love suggests that, while Kepler certainly did not describe the laws of (Continued on page 11)

REVIEWS

gravity for which Isaac Newton is rightly credited, he did posit the existence of a physical force, somehow controlling planetary motion, exerted by the sun.

In his readable and concise biography, Love describes a life that was hounded by misfortune, even by seventeenth century standards. Kepler often found himself in the middle of the religious conflicts between Catholicism and Protestantism. His first wife died very young, and his children encountered one tragedy after another. Of his twelve children, eight died as infants or early in childhood.

Love notes that “we can divide Kepler’s work neatly.” Scientifically, he achieved major advances combining observational data with groundbreaking applications of mathematics to arrive at his three laws. Yet Kepler insisted on seeing a divine pattern in a geometrically perfect solar system, not to mention his devotion to astrology as a valid field of study, notions that were, in Love’s words, ”hopelessly wrong.” Love concludes his admiring look at Kepler by stressing his subject’s frequent and significant interactions with other leading astronomers of his day, and in an epilogue entitled ”The Real Universe,” he explains the overarching influence of Kepler’s work on later generations.

‘Science Projects are More Authentic With No ‘Hypothesis’

by Tess Wearsch

Late winter sees the culmination of months of toil on that infamous science project required in many of our area schools. Teachers are checking the use of scientific method to make sure that student inquiry measures up to the standards of what is necessary for a valid and thorough investigation. If not in a formal science fair setting, then hopefully inquiry -based investigations/projects are being conducted in every science classroom around regardless of the grade level. Emphasis is placed on observation, reliable background information, controlled experimentation, data taking, applying scientific analysis, etc. Among these necessities is the proverbial ‘hypothesis’. I was one of those teachers who emphasized the importance of a correct hypothesis to keep one directed on the path when executing a valid investigation.

In a recent article in the NSTA Journal, an award-winning science educator negates this notion with very interesting insight into the necessity of a hypothesis. Matthew Bobrowsky, PhD, nationally recognized educator, author, researcher, and lecturer in science pedagogy and content, states, ”The truth is scientists rarely guess at an answer. Apparently, some teachers still incorrectly teach that a hypothesis is a prediction of the outcome of an experiment. …an educated guess.” Students are told to use the ’if…then…because’ format, however, Bobrowsky states that the real hypothesis should follow after the ‘because” portion of the statement. Erroneously, the ‘educated guess’ notion is even perpetuated in print and online besides in the classroom. “In actual research, scientists rarely ‘guess at an answer’.

The real hypothesis is the explanation of what is occurring and will then lead to the execution of the investigation. It is to be an ‘explanation’ of the scientific phenomena being investigated. So, instead of requiring a hypothesis, he asks us to have students state a research question or engineering challenge. He maintains that a good hypothesis should have an explanation of the observations and should make a testable prediction. The explanation should contain ‘what evidence supports the statement and what evidence refutes it.’ This then should lead to developing a controlled testable approach to the inquiry that is both valid and scientific.

Dr. Bobrowsky cites examples of how a hypothesis should be used in the inquiry of a scientific problem and the entire article can be found in the Nov. 2015 issue of the NSTA Journal.

NSTA PRESENTATION

Using Fairytales to Teach STEM

Last year I got to attend and present at the National Science Teachers Conference in Chicago. CRCST provided scholarship money in order to attend. I decided to reflect on a session that has inspired me to dig deeper and create a unit I can present at this year's SECO Conference on January 25-26 in Columbus. The session was titled BLAST Blending Literature and Science Together. The session gave ideas for grades 3–5 using hands-on explorations and "fractured fairy tales" as catalysts to introduce STEM concepts to early learners. Tales such as Jack and the BeanStalk, Humpty Dumpty, The Three Little Pigs, Rapunzel, and Goldilocks were aligned to NGSS Standards as a springboard for STEM concepts.

Can you build a parachute to get Jack down from the top of the Beanstalk? Can you design a catapult to reach Rapunzel in her tower? How do we make the porridge just right? Can we build a house the wolf can't blow down? How do we protect Humpty from breaking? These questions and many more were aligned to Next Generation Science Standards to engage children in STEM learning. The engineering process is utilized to tie literature to STEM. Thinking outside the box, students engineer ways to answer these questions.

I took this idea and decided to alter the title to BLASTT - Blending Literature and Science Together with Technology for a session at this year's Science Education Council of Ohio conference. Jack and the Beanstalk is the literature I will be using for my Classifying Living Things unit focusing on plants. The guiding question in this Project Based Learning Unit is "Is the impossible, possible?" The Great Bean Race from Intel can be used for this project. In this inquiry students compete within the classroom or with another classroom in the US to grow the tallest bean plant. The lesson plans for this can be found here: https://engage.intel.com/docs/DOC-51246. (continued on page 12)

I recreated this unit to adjust it to Ohio Standards and I am willing to share it with anyone who requests it. I will email it to you at no charge if you would like it.

https://www.teacherspayteachers.com/Product/The-Great-Bean-Race-685283

The packet I created is designed to accomplish the following:

- Identifying the Needs and Structures of Pants
- Writing a Friendly Letter
- Exploring and Identifying the Plant Life Cycle
- Working as a group
- Journaling change over time
- Drawing conclusions-Writing to Explain
- Graphing Temperature and Change
- Graphing Plant Growth
- Create Bar Graphs and Double Bar Graphs
- Identifying Variables in an Experiment

Technology was integrated using kidblog.org, Blendspace, Book Creator, and iPads to monitor growth over time, graph maker, etc. The kids journaled their observations and recorded data daily. It is a great supplement for third grade Life Sciences, and integrates math and technology. I will be updating this unit this year to include some of these engineering and design ideas: making grow lights, designing environments to support plant growth, and designing parachutes for Jack to jump from the beanstalk. I love using literature to make Science fun! (continued on page 13)

NSTA PRESENTATION

Soil and The Three Little Pigs

My presentation at NSTA was Soil and Three Little Pigs which was presented at the Fall CRCST conference. The goal of this PBL is to design a house out of soil that The Three Little Pigs can't blow down. Soil properties are part of the third grade curriculum. Students learn about the properties and importance of soil while designing and building their own house out of soil. We then tested our houses against the elements. Wind and Rain were simulated in the classroom. Students measured their houses before and after to determine soil loss and then graphed the results. Students kept track of their experiment using Haiku Deck. I created an eReader using ePubbud to facilitate this inquiry and also used Blendspace to outline the expectations of the student's presentations and help them organize their group presentation. Here is the link to my NSTA presentation: https://goo.gl/gLIUg In addition to using Blendspace, students also used Nearpod to explore different areas of the playground to compare soil types and report their findings. Children explored the texture and made observations for each type of soil. Integrating technology effectively to support hands on science in a systematic purposeful approach prepares students for future success.

I love project based learning and I appreciate all the CRCST has done to support science in my classroom. I am willing to share any materials just email me at Nowaks@Mentorschools.org. I also share my classroom projects via Twitter @Stephnowak3.

Come visit us at: CRCST.ORG
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CRCST
Jennie Hughes, Editor