AweSTEM 2017 Let Them Eat Kale

Title: Let Them Eat Kale - an interdisciplinary garden lesson for 1st grade designed and implemented by BHS Life on Earth students

The Objective: As part of the Life-1 lesson on sustainability, It Takes a Village to Raise a Meal, Life on Earth students help the 1st graders learn the basics of tending and tilling crops to grow food, as well as modeling healthy eating habits, and showing some students for the first time that food grows from soil, and a spirit of community and adventure can lead you to new tastes and experiences. With back-to-back schools, Life students go out to the community garden on the Swift River Elementary (SRE) property to learn these basic skills themselves. The knowledge is applied to determining the degree to which we can source the ingredients for a meal locally, then to research alternative ingredients to reduce the carbon footprint of the meal (including Sumac Tea - not poison - instead of Lemon), which we then cook and eat. This lesson is one in a series of cross-grade partnerships aimed at inviting HS students to see themselves as positively contributing to the community in which they live.

A clear description of what you would like to showcase:

Attendees will see a model of cross-grade partnerships (enhanced by the proximity of the schools) that actively engages hard-to-reach high school students in community service. With the foundation of the sustainability of human systems on Earth, Life students engage in a variety of projects focused on raising awareness of the vital ecological services that modern human society depends upon ... and how blind most of us are to the origins of our food. By partnering with the first graders, BHS students get a hands-on, dirt-under-the-fingernails, one-to-one interaction with younger students, and the first graders get personalized attention as they learn basic gardening skills.

On display will be models of the first grade Kale Farmers' Journal, script for the event, pictures and local newspaper article from the event, administrator feedback, BHS student feedback and reflection cartoons, BHS-student-generated SRE garden plans for next year, and our recipes for local Chicken Salad with Kale and Sweet Potatoes, fresh bread, Kale chips and Sumac Tea ... along with micro-instructions for students as we prepared the meal.

What standards are covered from the STE framework and/or math common core? :

MA ST/E Standards

HS-ESS3-3: Illustrate relationships among management of natural resources, the sustainability of human populations, and biodiversity.

HS-LS2-1: Analyze data sets to support explanations that biotic and abiotic factors affect ecosystem carrying capacity

HS-LS2-7: Analyze direct and indirect effects of human activities on biodiversity and ecosystem health, specifically habitat fragmentation, introduction of non-native or invasive species, overharvesting, pollution, and climate change. Evaluate and refine a solution for reducing the impacts of human activities on biodiversity and ecosystem health.

NGSS HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity(not included in MA ST/E standards 2016)

Climate Literacy Framework: GP: Humans can take actions to reduce climate change and its impacts
MA Environmental Education Plan (from Benchmarks on the Way to Environmental Literacy, SAGEE, 1995): An environmentally literate person knows and understands …

The patterns and networks of economic interdependence on the Earth's surface
How human actions modify the physical and biological environments
How physical and biological systems affect human systems

What are the end results that show enhanced engagement and learning gains by students?

Life students showed enhanced engagement and focus as they envisioned a new plan for the SRE Garden. Attention and assignment completion increased. The SRE Garden plans included more cross-grade activities in the garden, and the students showed evidence of more sustainability-thinking as they planned the Chicken Salad w Kale meal.

First graders actually tried the kale! Several of their families joined the SRE Parent-Teacher Garden Organization.

Why is this, in your opinion, an excellent, innovative example of teaching in either your subject area and grade level or of an integrated STEM activity that also aligns with the STE framework?

Cross-grade partnerships work, because the relationship-building of the shared experience permits the students on both the elementary and high school level to interact with the material in a way that helps them make meaning from the experience. Student engagement and attention spans are 2x-4x classroom activities (personal observation), student focus back in the classroom is enhanced, and student thinking shifts to a more community-oriented mindset. We are lucky to have the schools so close together.

As a member of the BPS STEM Integration Team, in partnership with The STEM Education Center at WPI, these activities serve as examples or even pilots of interdisciplinary lessons that elementary teachers could design as the BPS elementary schools move towards integrating more hands-on, STE-aligned activities. For the BHS students, this lesson included STE, Math and ELA skills that the students can bring with them into career and college.

How long you have done this activity with students and what results and interesting observations have you seen?

This was our first year for the Kale Lesson, though we had informally partnered with an SRE class or two in the garden prior. Darryl Clark (SRE 2nd grade) have a 7 year history of cross-grade partnerships with the Woodland Ecology classes in schoolyard excursions and joint field trips.

My students regularly ask me when we'll have the chance to partner with the elementary students again. My colleagues in all departments are more readily using the schoolyard as a curriculum resource.

Grade range for which this activity would be interesting and engaging:

All. The greatest limitation is proximity or transportation. Another iteration by one of my colleagues was a unit-end book written for a ~5th grade audience, that were shared with the 5th grade for editing and feedback ... through interoffice mail.

Names, titles, grade levels, emails, and school/district (if different than yours) of others who would present with you:

possibly ... depending on availability and administrative permission:
Darryl Clark, SRE grade 2 teacher, dclark@belchertownps.org
David Monroe, BHS Science Department ILT leader, dmonroe@belchertownps.org

Other information you feel is important to share:

With the Belchertown Public Schools as the only western MA school recognized for its excellence by Newsweek and one of the lowest per-pupil spending in the state, one of the highest rankings for MCAS scores year after year and among the highest student-to-teacher ratios in the state, the work that I do builds upon the amazing work of my fellow teachers and an insanely dedicated support staff, along with a community that is deeply engaged in the education of their children.
We plan to make best use of this fortune to bring the most engaging, enduring lessons we possibly can to our students, ones that they take with them as thoughtful, engaged citizens and pillars of their communities.
And besides, it is fun.