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Linda Rost teaches biology, anatomy and physiology, AP biology, chemistry, and science research for grades 10-12 at Baker High School in Baker, MT. She facilitated a successful science research program at Carter County High School in Ekalaka from 2007-2014 and started the program in Baker in 2014. In her twelve-year career, twenty-two of her students have competed at national or international science competitions. One student placed 1st at the National Junior Science and Humanities Symposium in 2012 and another placed 3rd in 2019. Additionally, one placed 3rd at the Intel International Science and Engineering Fair, and four have placed 4th. Rost obtained a Bachelor of Science in Range Science from New Mexico State University, a Master of Education in Curriculum and Instruction and a Master of Science in Science Education from Montana State University - Bozeman. She is currently pursuing a Doctor of Philosophy in Curriculum and Instruction - STEM from Texas Tech University. Rost is the chair of the Baker Public Schools Professional Development Committee, which she started in 2018 to focus on science, technology, engineering and mathematics (STEM) and Indian Education for All (IEFA) K-12 collaborations and grant projects. She serves as a teacher leader for the Montana Partnerships with Regions for Excellence in STEM (MPRES) and the Northwest Earth and Space Sciences Pipeline (NESSP) grants. She is a three-time winner of the Junior Science and Humanities Symposium Teacher Award, a two-time Continental Cares grant recipient and the 2016 National Vernier Engineering Contest winner.



Response Questions

Completed - Oct 29 2019

Response Questions

Respond to the following questions, highlighting your personal story, and why you believe you should be the 2020 National Teacher of the Year. Please indicate evidence of student impact. Please do not include external links. Maximum word counts are indicated in parentheses. Each question refers back to the aligned criteria on page 1.

1. Describe a content lesson or unit that defines you as a teacher. How did you engage students of all backgrounds and abilities in the learning? How did that learning influence

your students? How are your beliefs about teaching demonstrated in this lesson or unit?

(maximum 750 words)

I would characterize my teaching philosophy as this: to learn science and engineering, the students should be scientists and engineers. The questions they ask and the problems they identify are student driven. We have a mountain to climb that I have climbed before, so I know which side to scale and can anticipate all the ledges. I am there to guide and assist their explorations, while pointing out the magnificent scenery along the way, and enjoying the incredible view once we get to the top. We focus on sense-making and building the understanding of each student based on prior knowledge. Students reflect on their learning and engage in metacognition. I use many methods of formative assessment to dissect their learning. The learning we do is student-centered, often Socratic, engaging, relevant, and impactful. The age-old question, "Why do we have to learn this?" is a legitimate one, but they don't ask it in my classes. I would not want to learn something that doesn't impact my life, nor would I expect my students to.

One unit I designed is The Grizzly Truth: Bare Data on Yellowstone's Grizzly Bear Population. Grizzly bears were listed on the endangered species list in 1975. They were delisted in 2017, after the claim that their population had met the three necessary criteria. This decision was met with controversy, including lawsuits from the Salish-Kootenai and Blackfoot tribal nations calling for relisting of the bear, reinstatement of protections, and a ban on hunting.

Around 70,000 American Indians live in Montana and their cultural values tend to be very different from other cultures. Some of my students are Native American. A comprehensive and compassionate understanding of cultures will build friendships between these diverse groups of students.

To begin this unit, students learn about the delisting controversy by reading opposing articles. We learn about how grizzly bears are sacred to Native Americans and watch a video by Johnny Arlee, a Salish elder. Students build their understanding by graphing raw grizzly bear population data and engage in argumentation to determine if the criteria to delist the bears have been met. Then they form groups of three, one representing each criterion, and construct a proposal explaining their stance. Each individual student makes their own graphs of one of the criteria and forms their own conclusions, then defends their stance in their new groups. Students are very engaged as they build on their prior knowledge and construct their own conclusions after considering all sides of the issue.

Next is the pinwheel discussion, in which students look at the issue from other perspectives. In new "role" groups, students assume different roles within Montana's diverse landscape and read about their job descriptions and values, which they summarize and present on posters. The Tribal Council Member group learns about the roles and values of Native people, and how they regard natural resources. The Tribal Scientist group learns that while trained in western science, tribal scientists have a spiritual connection to the land and natural resources, which influences their decisions. The State Scientist group

learns that they manage and make decisions on natural resources for land use and recreation. The District Court Judge group reads all the job descriptions and roles, in order to lead the pinwheel discussion.

To facilitate the pinwheel discussion, one student from each of the four role groups comes to the center of the room where four desks are arranged in a clover shape, facing each other, with the other chairs grouped behind the four center chairs. Students are given discussion questions regarding grizzly bear delisting and management and discuss the issue from their perspective while honoring the values and philosophies of their role. Each student is in the “hot seat” at least once as we switch groups between each question.

In this unit, each individual student was engaged in graphing the data, summarizing and sharing the results with peers, constructing an evidence-based proposal, and discussing pinwheel questions. Students chose how to graph the data to answer their questions and worked at their own ability levels. They made sense of the data and constructed their own individual viewpoints before sharing it with others. I presented this lesson at the state teachers convention and had over sixty teachers in attendance. The Montana Office of Public Instruction also asked me to develop a course on this placed-based unit for Montana’s online Learning Hub, along with other culturally responsive units I have written.

2. Describe a project or initiative you have been involved in which contributed to the improvement of overall school culture. What was your role, how did you collaborate with others, and what is the status of this project today? Please include evidence of student impact.

(maximum 500 words)

When I started teaching in this district, I quickly noticed a deficiency in collaboration; I committed to changing the culture and breaking down walls by establishing relationships with teachers to work on collaborative units. I invited my classes into elementary and middle school classrooms to assist them on projects, which has many mutual benefits for my students and their younger peers.

I designed a CSI Mock Trial unit with the Government teacher. My Science Research class wrote the case and prepared the evidence, my Chemistry classes analyzed the evidence and solved the case, and the Government classes took the case to trial in the courtroom of our county courthouse. This year we collaborated with the local museum and opened a cold case of an actual death that occurred in that building in 1947.

I collaborated with a tribal scientist on a natural resources and climate change unit. A civil engineer and county commissioner involved students in our Baker Lake restoration project. I also have guest speakers visit my classroom, including a physical therapist, chemical engineer, nurse, and veterinarian, some of whom are alumni.

I participated in the Bringing Research into the Classroom grant through Montana Tech. Scientists engaged students in discovering phages, which are viruses that infect bacteria. Seventh and tenth graders joined my classes to go “phage digging”, taking samples of soil to extract phages that can infect a soil bacterium related to Tuberculosis. In 2016, my student discovered a phage which he named Yodasoda. He and other students have continued doing research on it. Last year, I conducted research on Staphylococcus aureus, investigating the role of iron uptake on phage infections in bacteria, providing an alternative to antibiotics.

However, I was still yearning for more collaboration. I worked with the Baker Educators Association to survey collaboration interest and formed an outstanding committee of ten diverse educators, an administrator, and two community stakeholders, who share my passion. We were awarded a grant for Indian Education for All (IEFA), which are part of Montana’s unique content standards, and presented a cultural diversity workshop for the entire district. I featured a 2015 Montana Teacher of the Year finalist and a tribal scientist as our speakers, and I took the teachers through my Grizzly Bear lesson. Our committee teacher leaders presented the seven IEFA Essential Understandings, on which they are leading professional learning communities this year. We had a total of 88% of our district sign up for this voluntary program, which was 50% more than what we wrote the grant for.

This type of initiative has never happened before in our district and I am honored to lead it. Several groups of teachers have already collaborated on cross-curricular lessons and student engagement has increased dramatically. I have seen racist attitudes dissolve in my classroom as students transform into culturally responsive learners. Our small school district in remotely rural southeast Montana has become a city on a hill, an example of scholarship in pursuit of relevant and culturally responsive, reflective teaching.

3. How do you ensure that education transcends the classroom? Describe specific ways in which you deliberately connect your students with the community. Please include evidence of student impact.

(maximum 500 words)

After conducting research in college, I knew that for students to truly learn science and engineering, they had to conduct cutting-edge research. While teaching in rural Ekalaka, Montana, I developed a successful Science Research class, which I replicated in Baker, Montana. Students design and conduct novel experiments and eclipse their peers at state competitions. Despite living 500 miles from the nearest research institution and 100 miles from the nearest Walmart and McDonalds, in the past twelve years, 22 students have competed at national and international science fairs. One student won first place at the National Junior Science and Humanities Symposium (JSHS) in 2012, along with \$16,000, and then went on to win 3rd place at the Intel International Science and Engineering Fair (ISEF). This year, one student

placed 3rd at the National JSHS and won \$4000. Students have also placed 4th at Intel ISEF four times. My students are out in the community, conducting place-based research on our local Baker Lake Restoration project, and finding bioplastic alternatives to baling twine, but they are also transcending the classroom by doing research with global impacts, researching phages, alternatives to antibiotics on resistant bacteria, and testing new treatments on cancer cells. They are empowered by their community to enter the world stage triumphantly as independent researchers. Their research is changing the world and transforming them into scientists and engineers of the future.

I started the Baker Science Fair and the community attends student presentations. Judges include doctors, government officials, veterinarians, nurses, extension agents, and engineers. Many students from the fair have also competed at the regional fair and won. We organized a Chemistry Magic Show for younger students and also visit their classrooms frequently to do presentations and help with experiments.

I brought the Maiasaura Mobile Lab, developed by the Museum of the Rockies, to Baker. I helped teachers to develop lessons to fit their grade level and brought my students to help; it was used in twelve K-12 classrooms, impacting over 250 students. My students' passion for science is palpable and contagious and has motivated them into their college careers in science, engineering, education, and medicine.

I coordinated a PTA STEM Night, and my students assisted over 100 elementary students and their parents in STEM projects. My students and I developed "Science Fridays" at our local museum. We designed engaging learning activities for students, parents, and community members. We helped the 5th and 7th graders make veggie cars to race at our local Farmer's Market, using produce from local farmers. My students and I worked with the Baker Recreation Department to organize a STEM Camp at our museum where 3rd - 6th graders conducted experiments on nonrenewable and renewable energy in our county.

I have offered online classes and workshops for teachers across the state to develop inquiry-based lessons in the Next Generation Science Standards. I post videos on YouTube of students learning with my innovative lessons as a professional development tool, and I have published numerous articles.

4. What do you consider to be a major public education issue today? Describe how you demonstrate being a lifelong learner, leader, and innovator about this issue, both in and outside of the classroom walls.

(maximum 500 words)

Across the country, especially in poor and rural regions, the teacher shortage has reached crisis levels. It is amplified in Reservation schools, where these students experience racism and inequity. There is high attrition in rural schools, as teachers move to urban schools or leave the field. Furthermore, there is low enrollment in teacher preparation programs across the nation.

Many solutions have been proposed, including alternative licensure and loan forgiveness programs for Reservation, rural, and high need teachers. Rural mentorship programs in content areas and cultural inclusivity can improve teacher morale and effectiveness, promoting retention when they are the only teacher in their subject area in culturally and racially diverse schools.

I have taught in two of the most rural districts in Montana, the most remote state, for my entire career. I have refused to buy into the philosophy that rural and minority students will not have access to an excellent education like their peers across the nation. I am also a product of the teacher shortage, and evidence that high quality alternative licensure is achievable. I was recruited with a Bachelor's of Range Science, when they were desperate for a science teacher. My career began on an emergency authorization, which the Montana Office of Public Instruction greatly discourages. Twelve years later, they selected me as the Montana Teacher of the Year. My distance licensure program developed me into a reflective practitioner who can stay the course in an isolated setting and thrive. Mentorships and home-grown alternative licensure programs can raise up and transform rural schools.

I am a teacher leader for two grants in Montana and have provided professional development in rural Montana for the past five years, including workshops for the Prairie View Curriculum Consortium (PVCC) of 33 rural schools. I was on the writing team for the new Montana Science Standards and I led the writing of our new Science curriculum for PVCC.

My efforts have elevated K-12 science teaching in Montana, and teachers are now equipped to teach scientific literacy to combat dangerous student misconceptions such as climate change, vaccinations, or GMOs. Such misconceptions could affect our health and environment in very significant, even irreversible ways. It is paramount that students develop the skills required to become scientifically-literate, critical thinkers who will be our future community, state, and national leaders.

To support high need teachers and schools in my region, I will be leading phage discovery summer camps in rural Reservation schools and at the Montana School for Deaf and Blind, while mentoring teachers in facilitating authentic student research, as part of our newly funded National Institutes of Health PHAGES grant. This mentorship program will help connect teachers in the region and battle the teacher attrition problem in practical and measurable ways, while reaching the most marginalized populations.

I am pursuing a PhD in Curriculum and Instruction, and my dissertation will involve studying factors affecting the teacher shortage in rural schools. I will also be providing professional development to rural Reservation schools to prevent teacher attrition.

5. As the 2020 National Teacher of the Year, you serve as a spokesperson and representative for all teachers and students. What is your message? What will you communicate to your profession and to the public?

(maximum 750 words)

Teachers are my people. I was raised by teachers and though I tried to pursue a different path, I quickly realized that the calling was irrepressible. The state of education is currently at an impasse, and the role of a teacher has changed significantly in the past century. The public's view of teachers is evolving, and teachers are emerging as fearless leaders in their communities. They are even emerging on the national stage, facing and transforming policy in ways that will positively affect education across the nation.

To be teachers today, we must be resilient. We must be resilient against the challenges our students face at home and within their hearts to help them navigate through childhood and adolescence and find themselves. We must be resilient against the dangers in our local communities and even the dangers in their smartphones. We must be resilient to fight through adversity and battle the systemic racism that is vitiating our students who have experienced deculturalization and transform ourselves into their advocates and voices. We must be resilient to provide our students with the best education we can, despite the lack of resources. Never has the role of a teacher been so important.

I have opportunities to be resilient for my students. The first time I took students to compete at Intel International Science and Engineering Fair, I saw thousands of students from all over the world conducting sophisticated research. Many students were working with scientists from world-class research institutions; my students were not. They were from a tiny town in the middle of nowhere. They faced their competition head on and placed among the top ranks. My students possess resilience, resourcefulness, humility, and grit. They deserve my best. I vowed then to be resilient for them. I vowed to give them all the resources and skills I could to ensure they could do any research project, and their research is changing the world.

The path to achieve this has been challenging. I have taken chances that I never would have considered and engaged in programs that trained me to be a better teacher, to provide the knowledge and resources necessary to serve the needs of my students. Not only did my pedagogy and philosophy for teaching transform, I was personally stretched and molded until I even saw myself differently. I emerged a leader, a resilient one. I looked back and saw that all these experiences that I struggled through shaped me into the teacher leader I am today. I can bravely rally a group of teachers with passion and excitement and lead them on an adventure of which maybe only I can clearly see the goal. I can pour into their lives like so many have for me and make a difference to provide all students with the best possible education. I can help to develop impactful and contagious teacher leaders, resilient ones, who will fight for what is best for our students.

We are the boots on the ground. We are the ones who know the needs of our students best. We need to be in each other's classrooms, collaborating on cross-curricular lessons. We need to be breaking down classroom walls and getting our students into the community, giving them opportunities to take part in decisions and start initiatives. We need to show them that we honor and value their voices and that they can change the world. We need to be going to our nation's leaders and fighting for our students' needs. The field of education today is like a dense forest, with debris and dead leaves suffocating the soil. I think

it's time for a bit of a prescribed burn on these centuries-old, ineffective teaching methods. We are the ones who should be conducting research on our students to contribute to the field of educational research which we can transform into real pedagogy, in the real world, to impact real students. The future of the world is in our classrooms. The landscape of the future will involve jobs that we never knew could exist, tackling problems that don't yet exist, using technology that has not yet been invented, but my students will be equipped with the research skills I have taught them to succeed in an inconceivable future with resilience and fortitude. We want our students to be expert humans, so we as teachers need to lead that charge. We are resilient and resourceful, and we can transform ourselves into professional educators who will change the face of education.



Letters of Recommendation

Completed - Oct 30 2019

Attach 3 recommendations that support why you should be the 2020 National Teacher of the Year. At least one of these must be a recommendation from a parent, colleague, administrator, or student and each letter should not exceed one page in length. The file should also be in .pdf format.

Please title the file in the following format:

LastName_StateAbbreviation_Recommendation1.pdf LastName_StateAbbreviation_Recommendation2.pdf
LastName_StateAbbreviation_Recommendation3.pdf

Rost_MT_Recommendation1

Filename: Rost_MT_Recommendation1.pdf **Size:** 77.1 kB

Rost_MT_Recommendation2

Filename: Rost_MT_Recommendation2.pdf **Size:** 81.6 kB

Rost_MT_Recommendation3

Filename: Rost_MT_Recommendation3_q83F4dJ.pdf **Size:** 232.1 kB



Headshot

Completed - Oct 29 2019

Attach a headshot (color, portrait orientation, 300 ppi, .jpg format). This headshot will be used on the CCSSO website and in promotional materials for CCSSO and the NTOY Program. By completing this section, you agree that your biography and headshot can be used in CCSSO materials.

Please title the file in the following format:

LastName_StateAbbreviation_Headshot.jpg

Rost_MT_Headshot

Filename: Rost_MT_Headshot.jpeg **Size:** 22.8 MB