2024 National Teacher of the Year
FINALIST

Cat Walker
ALASKA

School: Dimond High School
Subject: Science & Career Tech Education
Grade: 9-12
Catherine Walker is a National Board Certified Teacher who teaches oceanography, marine biology, unmanned aviation science and Project Lead the Way engineering essentials to students in grades nine through 12 at Dimond High School in Anchorage, Alaska.

Walker has taught science and career and technical education classes since 2006 and also sponsors the Battle of the Books, Gender Sexuality Alliance, National Oceanic and Atmospheric Administration Ocean Guardian and National Ocean Science Bowl clubs. Walker also teaches courses for educators new to science at Prince William Sound College.

Walker is a member of the Pacific Ocean Educators Network and a board member for the Alaska Society for Technology in Education. Walker has a Master of Arts in teaching from the University of Alaska, Anchorage, and a Bachelor of Science in biology from Brandeis University in Waltham, Massachusetts. She completed the Semester in Environmental Science at the Marine Biological Laboratory in Woods Hole, Massachusetts, and won the Eleanor B. Schick Award for Environmental Excellence from Brandeis University.

She is the Alaska science awardee for the 2015 Presidential Award for Excellence in Math and Science Teaching. In 2019, Walker earned her National Geographic Educator Certification and attended the National Geographic Education Summit in Washington, D.C. In 2023, Walker was awarded the Alaska Marine Science Outreach Award, the National Science Teaching Association’s Shell Science Teaching Award and the Alaska Oil and Gas Association Teacher Grant. Walker is a 2023 Earthwatch Project Kindle Fellow and a 2023 National Geographic Grosvenor Teacher Fellow.

**Application Questions**

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? Show how your deliberate instructional decisions create student learning and reveal your beliefs about teaching and learning.

While I currently teach three very different classes to a diverse population of students, I develop problem-based career-oriented lessons for all of them that focus on sustainability and stewardship of our natural resources and encourage students of all ability levels to build empathy and collaborate to develop solutions to problems they identify in their communities. Students explore related careers that would improve communities and help them have fulfilling lives as connected community members.
Through these experiences, students exercise a growth mindset as they explore career pathways and develop technical and professional skills. I support my students in securing internships in fields of their interest and currently have four students interning with local businesses. I support my students who are traditionally underrepresented in STEM careers by opening my classroom to business partners who help them envision themselves in future career pathways and celebrate their cultural knowledge.

Students learn to support their mental health and persevere with high expectations while completing interdisciplinary lessons like our EcoBlitz events where students geolocate and identify trash on campus during trash cleanups, identify problems, propose solutions to our administrators, and put those solutions into action.

As another example, my drone class designs and completes tasks related to natural resource conservation jobs including a “Snotbot” simulation with a cardboard fog whale with our Alias drones, and an activity with our Maviks to simulate the location of polar bear dens with infrared cameras. In the Snotbot lesson students spent time researching traditional methods of collecting data from whales and learned why that data was important in assessing their health. They brainstormed and discussed ways drones can improve safety and efficiency while decreasing cost. Using the engineering design process students adapted their drones to collect “whale snot” with Petri dishes and collaborated as flight teams to test their designs with Betty the fog whale. Students measured the amount of fog collected and reflected on the success of their designs. The local news filmed the event, promoting awareness and sustainability to the larger community. The drone class is currently building their own Remotely Operated Vehicles (ROVs) which we use for career simulations in our pool along with a commercial ROV.

In my Project Lead the Way engineering essentials classes students learn computer-aided drafting and design and print their own projects with a focus on their community. For example, my students were asked by one of our business partners, a local eye doctor, to design a cheaper and more ergonomic phone holder for patients with low vision to be able to read their correspondence. Students completed their designs, tested prototypes, and recently delivered 30 holders to the business partner to give to their patients. One student was asked by another school business partner, our local police department, to design an improved quick-clip connector for door breaching, thus improving community safety.

Through my work with NOAA as an Ocean Guardian School liaison and as a member of the Pacific Educators Network, my oceanography students are part of the global community. My students have shared 5-clue mystery location challenge videos and plan to send temperature-sensitive corals to simulate coral bleaching. These were 3D printed by one of my students for a
passion project which also included educating students at our nearby grade school. Other passion projects students have presented include children’s books on shark finning and marine debris, activities about bycatch, and collaborative projects on ROVs. Oceanography students complete biannual remote beach cleanups, community-funded to ensure equity, where they collect hundreds of pounds of marine debris. With the assistance of a local engineer, they sort and identify the debris back in the classroom and learn how to grind and extrude the plastic into synthetic lumber. Students then research, brainstorm, and promote their own marine debris solutions to the community.

Lastly, as a teacher-leader, I support educators as a district Professional Learning Community lead, Equal Opportunity Schools member, Career and Technical Education Department Chair, and task force member for our transition to wall-to-wall Career Academies in our district of almost 43,000 students. Alaska has a need for both development as well as sustainability, and I feel strongly that all students deserve personally meaningful and fulfilling work-based learning experiences to improve their college, career, and life readiness. Through my experience as an Earthwatch Project Kindle Teaching Fellow and my upcoming experience as a National Geographic Grosvenor Fellow, I plan to continue to expand my students’ experiences with sustainability and continue to empower them to have control over their impact on the world.

2. Describe a project or initiative you have been involved in that deliberately creates culture in your classroom or school. Describe how you build and use relationships to collaborate and to teach students of all backgrounds, abilities and identities. What is the status of the project today?

When I started teaching at Dimond High over six years ago I founded our National Ocean Science Bowl Club because careers related to the ocean are readily available and necessary for continued sustainability here in Alaska. Our connection to the marine environment as Alaskans is not only economic but cultural as well. Student interest in learning more about the ocean was evident and many requested oceanography and marine biology classes, so I volunteered to start them and am in my third year of teaching them. The club and classes were the beginning of building sustainability awareness school-wide and has grown to many different opportunities for students. To start, I connect my students to the larger world outside our classroom through collaborations such as the National Oceanic and Atmospheric Administration Ocean Guardian School Program and the Pacific Educator Network and through numerous work-based learning experiences including classroom presenters, internships, field trips, career fairs, and events including the Marine Science Symposium, the Beluga Festival, the Resource Development Conference, the Tsunami Bowl, and the Meet Alaska Annual Energy Conference.
I create a culture of sustainability and empowerment by having students collaborate on learning about and solving real-world problems and learn about careers related to the topics they are learning and the technology they are using so they can see the relevance and connect what they enjoy to future life goals. Problem and place-based lessons celebrate cultures and help empower students to make positive change on the world around them. For example, my engineering students study the United Nations Sustainable Development Goals and choose goals to research and present solutions. Last year these students collaborated with a local nonprofit, Alaska Resource Education, to design interactive and edible activities to simulate carbon sequestration. My oceanography students collaborated with the Wildlife Conservation Center to design an activity they can use to teach beluga whale conservation.

My students also focus on sustainability and empowerment outside of my classroom in a variety of ways. I started the Green Effects Recycling Club, which meets weekly to collect paper, aluminum, and plastic bottles and does campus cleanups. I also sponsor the National Ocean Science Bowl Club and chaperone the Powerful Opportunities for Women in Science Camp. I schedule and accompany my oceanography and marine biology students when presenting their passion projects to classes at our neighboring elementary school. My students have presented to 1st, 5th, and 6th-grade classes about the importance of coral reefs and how to help them recover using slide shows, 3D printed corals that simulate coral bleaching, brochures, and children’s books about reef-safe sunscreen and led games teaching them about the bycatch risk of different fishing methods. Due to student interest, I supported students through a NOAA Ocean Guardian grant in starting their own coral reef tank, which they set up, complete daily water quality tests, and began adding organisms to. They plan to practice coral grafting as they learn about reef restoration, add labels about what is living in the tank, and give tours to other Dimond students and students from the neighboring elementary. My students also complete biannual remote beach cleanups and work with a local engineer to identify and sort marine debris and turn some of the plastics into synthetic lumber. Through activities such as this students learn that their decisions matter and that they are never too young to protect and change the world.

I teach in a district of almost 43,000 students and one goal of mine is to support work-based learning experiences to empower all students and help them on a path to careers that benefit their communities through my work on the College, Career, and Life Ready Career Academy launch. I am on the task force to develop wall-to-wall career academies at all eight comprehensive high schools in my district. We are starting freshman academies next year and will be working with students and the community to select three to four Career Academies at each school so students have more access to work-based learning experiences and dual credit.
opportunities. I am using my experiences building a culture of sustainability and empowerment in my own classroom and school for this district-wide initiative.

3. Describe specific ways in which you deliberately connect your students with the community. Show how these community connections dissolve classroom walls and are used to impact student learning and success.

Students cannot know what careers they want without first experiencing them. The best way to accomplish this is to meet and interact with people in those careers, ideally people who look like them. All students deserve to engage with professionals in all classes and at all levels. This helps both the students as well as schools with the public becoming more involved.

Last school year I had professionals visit on 31 occasions, took students to three conferences, assisted clubs in five statewide academic competitions and one national competition, secured long-term beach cleanup funding from a national company along with donated buses, brought a drone flight team to Valdez to film the Stol Competition and Fly-in Air Show, and involved the local news with three events showcasing student work on sustainability in their community. I also facilitated six groups of students presenting at our neighboring elementary school.

My unmanned aviation science class welcomed commercial drone pilots, internship coordinators, pilots, college students involved in aviation, and Alaska’s Center for Unmanned Aviation Systems Integration. These presenters shared their expertise, flew with students, and arranged a paid internship for a student. The director of the Alaska Ocean Observing System also met with my students after they completed their “Snotbot” project to hear their reflections and share about working with NOAA and actual Snotbots.

In oceanography and marine biology, students learned from an octopus specialist, a whale specialist, a Navy recruiter who shared specific ocean-related careers, and a NOAA marine mammal entanglement specialist. This year my oceanography students are working with the owner of Alaska Coral and Fish to start a coral reef tank to raise community awareness of the importance of coral reefs and practice and share solutions to coral bleaching.

Engineering classes hosted an oil derrick specialist, wind turbine specialists, solar energy specialists, a biomedical engineer, a USGS employee specializing in GIS, an exploration geologist GIS analyst, a presenter from Renewable Energy Alaska Project, a carbon sequestration specialist, and civil engineers. These visits included student projects and competitions and helped me learn about the latest updates in their fields.
All of my students spent multiple days learning from and working with a local engineer who turns marine debris into synthetic lumber, college recruiters, and an eye doctor who taught them about eye anatomy and the importance of taking care of their eyes as well as sharing her career path. She also gave them the challenge of designing and 3D printing phone holders for low-vision patients. The payment for the phone holders was used to help send some students to a national wind turbine championship after they won the state competition.

My unmanned aviation science students attended the Resource Development Council’s annual conference last year, and we have been invited again this year. At the conference, the students were celebrated for their work with Alaska Resource Education and they were able to attend the panel discussion on updates on Alaska’s resources and participated in speed networking with the conference attendees. Alaska Resource Education invited the students, along with my oceanography and marine biology students to the Meet Alaska Annual Energy Conference, where they did more speed networking and learned about the purpose of resource extraction as well as sustainability and conservation. My oceanography students ran a booth at the Alaska Marine Science Symposium and taught the attendees about our statewide Tsunami Bowl competition, which is a precursor to the National Ocean Science Bowl as well as having the chance to network with scientists and visit poster sessions. This year students ran a booth at the Beluga Festival and were able to share the work they have been doing as NOAA Ocean Guardian School students.

As the Career Technology Education department chair at my school, I support my colleagues in partnering with the community as well. Last year we put on three Monday-morning career fairs that had about 100 students and 10 businesses in attendance as well as a larger half-day career fair with over 150 students and 15 businesses. This year we are planning a large half-day career fair for the whole school. This past summer I chaperoned a Powerful Opportunities for Women in Resources weeklong camp where I connected 15 Alaskan girls with women working at mines, training centers, and geothermal plants across Alaska. These community connections empower students to contribute positively to the world around them and build a stronger connection to school. Students grow from struggling with attendance and motivation to readily volunteering extra time to participate in events and projects.

4. Describe a time when you grew as a teacher leader and life-long learner as a result of being an advocate in your school, state or beyond. Describe your advocacy, how it helped you grow and how it impacted students.

Over my 18 years of teaching, I have slowly gained experience as a teacher leader through my life-long learning mindset. Completing my National Board Certification was an incredibly
beneficial learning experience that helped me reflect on my teaching practices and better understand my students and how they learn. As a new teacher, I was only advocating for my own students but was able to share my newfound knowledge during team meetings. As I continue to take on new challenges I have become empowered to advocate for students throughout my school, state, and even beyond.

I have grown as a teacher leader by modeling a willingness to embrace change. I started my teaching career as an 8th-grade integrated science teacher and since then I have taught 7th-grade science, art in nature, applied technology, 9th-grade science, biology, Project Lead the Way engineering essentials, oceanography, marine biology, and unmanned aviation science. I still teach the last four courses and started them at my school. When I was offered the unmanned aviation science class, flying drones was not on my radar. After completing my National Geographic Teacher Certification and my Project Lead the Way (PLTW) training for my engineering course, I was advocating with my district leadership to teach another PLTW course on environmental sustainability. I love the project-based learning and real-world global problem-solving design of PLTW classes and wanted my students to prepare for jobs in natural resources and sustainability. At the time my district leadership was looking for a teacher to start a drone program at the school and I was selected to be trained for that instead. I went into the course knowing next to nothing about drones and aviation, but absolutely loved the rigor and relevance of my training. I earned my FAA 107 commercial drone pilot license and have found that the course is a great way to teach my students about careers in sustainability and aviation.

As I gained competence in my courses I also worked to support pre-service and new teachers. I have now mentored nine pre-service teachers in their internships for the University of Alaska, Anchorage, Fairbanks, and Southeast. The last two summers I have also taught a Prince William Sound Ecology course for teachers from across the state, many from rural and remote areas, new to science teaching. Due to my experience and ability to support other teachers, I was selected for the role of a school professional learning community lead, a department chair for our Career and Technical Education department, and the Equal Opportunities for Students district task force, where we are working to increase the number of historically underrepresented students in AP courses by improving classroom culture and support. As a member of the task force to implement wall-to-wall career academies at our eight large public high schools in a district of almost 43,000 students, I was sent with a group to Nashville to learn from their experiences with career academies and was on a panel introducing the implementation to our district in the spring, as well as featured in a recent news broadcast introducing the academies to the public.
Recently we completed a community convening where we worked with the community, students, and leaders to start the process of selecting academies that will best prepare students for college, career, and life readiness.

I collaborate and support educators and their students on a national level as well. At the beginning of the pandemic I worked closely with a teacher in Missouri to adapt our Project Lead the Way course for Canvas and Zoom and developed hands-on-at-home kits for our students so they could continue to have fun with project-based lessons. This summer I collaborated with other Earthwatch Project Kindle Fellows during our fellowship in Costa Rica where we studied pollinators, and I have plans to bring a student group to the Osa Peninsula, Costa Rica in 2025. Through my collaboration with other Lindblad National Geographic Grosvenor Fellows, the work I complete on my fellowship will impact students across North America.

I will be speaking at our state’s capitol to students from Educators Rising in February and am thrilled to be able to support students in their path to becoming teachers. Through my willingness to embrace a life-long learning mindset, I have grown as an educator to one who only impacted the 150+ students in my classroom to thousands of students and the growth is exponential as I continue to support teachers and pre-service teachers and encourage their life-long learning as educators.

5. As the National Teacher of the Year, serving as the ambassador of education for the United States, you have been asked to give a speech to a large audience of teachers. This speech is being recorded and will be shared broadly with a larger audience. What is your message? What is the talk you give? [You may indicate a specific audience. For example, a “back to school” talk.]

I have a student who started my freshmen engineering class over Zoom due to the pandemic. He had great participation but didn’t turn things in and had a history of failing classes. Once he got my hands-on-at-home kit and shared his micro:bit and circuit board creations I realized his potential. When we worked together with Tinkercad to learn computer-aided design he blew me away. When we returned in-person, he was able to explain to me the complicated code and circuitry he was designing. Then he really found his passion: 3D printing. He spent hours designing, printing and teaching other students and my district Career Tech Education Coordinators now asks his advice on printing issues across our district of almost 43,000 students! One day, when he was walking with his newest print, our school Safety Resource Officer pulled him aside and gave him a challenge. The Anchorage Police Department was using faulty and expensive quick-clip connectors (QCCs) for breaching doors. The officer was hoping my student could make improved QCCs. Over countless hours and nine iterations my student...
reverse-engineered the QCC and printed them at a higher quality and 1/20th of the cost. The police chief and mayor honored him at a school ceremony with a demonstration. This same student won our statewide wind turbine championship and to fundraise to pay for nationals he designed and printed accessible phone holders for low-vision patients which a local eye doctor can provide for 1/10th the cost. Now a senior, he still spends time in my room fixing printers and helping students. He is currently working for a 3D printing company and begins an engineering internship next month.

I am telling you this because when you meet this student and see his capabilities you would never imagine he continued failing classes. As a senior he is in danger of not graduating unless he passes all remaining classes. In the classes with worksheets and a sage on the stage he shuts down.

It is so important for us to remember the youth of today have the ability to contribute to their communities and shouldn’t have to wait until they enter the workforce: they can be changemakers right now. Students immersed in relevant work become engaged in the learning process. Strong public schools improve communities by connecting student learning to careers and involving the community in problem-based learning. Students should be exposed to real-world problems on local and global scales and be given opportunities to explore and propose solutions to these problems. Students should learn to collaborate with their peers and experts in the field to reflect on the ethical dilemmas inherent in solutions, and to brainstorm ways to increase access and equity. It is important for educators to teach with a lens of sustainability and stewardship of natural resources so students can understand the impact that their actions have on future generations. Learning should be made accessible for all students and connections with experts from different ethnicities and cultural backgrounds should be fostered so historically underrepresented students can see themselves achieving future success related to their passions.

Students need to get outside of the classroom and into work-based learning opportunities like field trips, job shadows, internships, and mentorships. We need to bring the community into the classroom so professionals can support teachers in their understanding of current practices and knowledge and so that students can learn from experts in their field.

For too long educators have been focusing solely on sending students off to college, and currently, the majority of our students are following other pathways. Educators need to adapt from teaching in the way they may have been taught to problem and place-based learning where students work collaboratively towards solutions that will benefit their communities. Educators need to empower students and allow the community to support them in preparing
students for success in life, careers, and any higher education that they choose to pursue. While college is an important part of a career pathway for many of our students, many others will find happiness and meaningful wages in careers that benefit their communities through other pathways.

Mental health, both of students and educators, is at risk due to the pandemic and global events. We can combat this by empowering our students to be changemakers and by involving our communities. As students like my senior work to identify and solve problems, they strengthen our resiliency and improve their mental health. Kids want to be changemakers, we just have to let them.