The Polar Bear Challenge: Local Impact on a Global Issue

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Abstract

The Polar Bear Challenge is 21-day statewide event hosted by Utah's Hogle Zoo. It is designed around the concept that polar bears and people want the same thing – a healthy planet. The Zoo is home to a female polar bear that is an ambassador for her species and a tangible way to teach the public about climate change. The Polar Bear Challenge provides teachers and students with a means to lower their carbon footprint by making small changes in their daily lives and lowering their impact on the planet's natural resources. The Zoo challenges each class to make the changes for at least 21 days (the time it takes to start a new habit). Classrooms that make the greatest differences receive prizes from the Zoo and every participating class benefits polar bear conservation efforts and makes a positive impact on slowing down climate change. Pre- and post-survey results over the past five years have shown an increase in student understanding of climate change science and how their actions can make a difference.

Introduction

Polar bears are an iconic species in many ways. They are top predators in their ecosystem and are a powerful symbol of the strength and endurance of the Arctic. They are charismatic and treading on thin ice – making them an iconic symbol of the effects of climate change on the Arctic ecosystem.

Utah's Hogle Zoo became an Arctic Ambassador Site in 2007 for Polar Bears International (PBI). PBI's mission is to conserve polar bears and the sea ice they depend on. Through media, science, and advocacy, they work to inspire people to care about the Arctic, the threats to its future, and the connection between this remote region and our global climate.

As part of a conservation/education outreach program sponsored by PBI, the author had the amazing opportunity to see polar bears in the wild. It was in October and the bears were waiting for the sea ice to form in Churchill, Manitoba, Canada. That year, the sea ice was six weeks late in forming and the bears were using up what was left of their fat reserves waiting for the ice to form so that they could head out to hunt. We were seeing the effects of climate change in action.

This trip resulted in a desire to create a program that would make a difference with regard to carbon footprint reduction. The program needed to generate action within the Hogle Zoo's community, to

make a difference for the future of polar bears, and to positively affect both the people and wildlife of Utah. Rather than start a large community campaign, the choice was made to focus on the audience the author knew best – kids and teachers.

As an informal educator, I knew that children, when given the opportunity, are excellent environmentalists. In fact, they are often the driving force behind motivating their parents to change their actions. The challenge was to create a program that students and their teachers could participate in, without adding a lot of extra work to the teacher's plate.

Taking on the Challenge

The first step was to design a program that aligned to the Utah Core Standards for Science. The overarching Science Core is the same for each grade level: students are to be able to apply scientific processes, communicate scientific ideas effectively, and understand the nature of science. To do so, they must be able to use the processes of scientific investigation (i.e. framing questions, designing investigations, conducting investigations, collecting data, drawing conclusions), communicate effectively using science language and reasoning, and understand the nature of science. Using these standards, a program was created where students could take action, while developing skills that met the Science Core. This would help teachers meet their teaching goals for the year and provide their students with a "real life" activity to collect data, calculate results and an opportunity to share their project with the community.

Figure 1. Student reducing energy consumption through recycling.

In 2010, the Polar Bear Challenge was launched to elementary schools in the 13 school districts that surround Hogle Zoo. Teachers began by having their classes calculate their carbon footprint. Then they worked with their students to explore ways their class could reduce their energy consumption. The class was then asked to choose an action – many chose multiple actions – and make those changes at their school or in their homes (Figure 1). To participate in the challenge, the classes needed to carry out their carbon footprint reduction actions for a minimum of 21 days over a two-month period. At the end of the 21 days, the class recalculated their carbon footprint. Teachers then

Figure 2. Polar Bear Challenge winners from Harry S. Truman Elementary School, West Valley, Utah.

Polar Bear Challenge Curricular Materials

Resources:
http://uhzpolarbearchallange.org/polar-bear-challenge-resources/

Web Links:
http://uhzpolarbearchallange.org/polar-bear-challenge-resources/polar-bear-challenge-links/

submitted the class' write-up of their project, data and results, along with six to ten photographs of their students doing the project and/or a video. Hogle Zoo staff reviewed each of the projects and the results, and the winning classroom was selected.

The winning students and teacher received Zoo tickets, t-shirts and a large framed photograph of a polar bear, along with $500 of books for their library related to the Arctic, polar bears and actions children can take to make a difference for the environment, as well as an outreach visit to the entire school from some of the Zoo's animal ambassadors (Figure 2). Two classrooms were selected as runners-up. These classrooms received Zoo tickets, photos and a classroom visit from the animal ambassadors for their efforts. The first year of the Challenge, approximately 800 students and their teachers participated.

In 2011, the Polar Bear Challenge was selected as a recipient of a grant through the National Oceanic and Atmospheric Administration's (NOAA) Climate Steward program. The money provided the opportunity to create an information packet to help teachers to create their plan, as well as develop curricular materials and point to web resources to help teachers integrate the challenge into their classroom activities. Students were given pre- and post-tests in order to see, if by participating in the Polar Bear Challenge, students understood the science of climate change and how their actions impacted the issue both positively and negatively (Figure 3). During the five years the challenge has been carried out, student scores between the pre to post-tests have increased by ten percent or more. The results indicate that students not only have a much better understanding of climate change but that they also feel that they can make a difference.

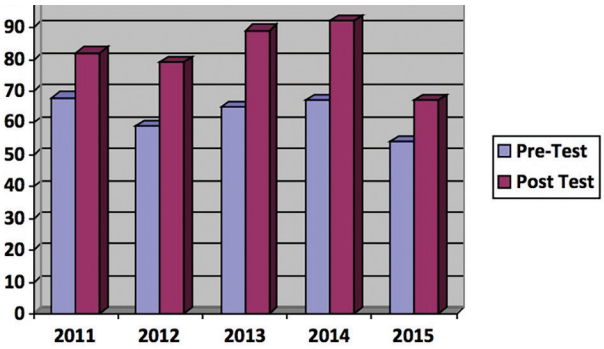

Figure 3. Graph illustrating the results from the pre- and post-testing of student understanding of climate change before and after participating in the Polar Bear Challenge.

The grant also allowed for the expansion of the program to secondary schools in these districts by helping to provide additional teaching materials and prizes. Unfortunately, not as many students have been seen to participate in the program as have been consistently seen from the elementary schools. Based on a follow-up survey, middle school teachers in Utah have a harder time fitting the challenge into their curriculum since they don't teach about climate change. However, we may see interest in the program increase beginning this year — the new Utah Science Standards may be adopted and the grade eight standards include teaching about climate change. The Polar Bear Challenge will provide teachers with curriculum as well as with an action project for their students without a lot of additional training or work on their parts.

Figure 4. Student reducing energy consumption by biking to school.

Program participation has continued to grow overall and has averaged about 2,300 participants in the last two years. Some of the student projects have included: students working with their school district food service companies to serve meatless Monday lunches, getting rid of plastic ware, starting a school composting program, bike-and-walk to school programs (Figure 4) and no-idling campaigns (Figure 5). Often teachers and students choose not only an in-school program but also a project that students can complete at home. These have included monitoring what goes into their trash and making sure it gets recycled, turning off the water when brushing their teeth and unplugging all electronic devices not in use at their homes. Students learn how these

actions reduce energy use as well as how much energy is used to produce the various products. Often, teachers provide feedback that the students have become much more conscious consumers.

In 2015, another grant through the NOAA Climate Stewards Education Project was approved and an app that will help teachers calculate their carbon footprint data in a more standardized way is in the process of being created. Although the curriculum provides the teachers with reputable online calculators, such as the Environmental Protection Agency's Carbon Footprint Calculator, not all data has been calculated correctly and often takes quite a bit of the Hogle Zoo staff's time to recalculate. When completed, the app should not only provide a standardized method of calculation, but also help classes build their portfolio to make their school a GREEN School in conjunction with the Utah Society for Environmental Education's GREEN School Program.

Figure 5. Student note from a No Idling Campaign.

Going the Distance for the Planet

Teachers that participate in the program for multiple years, often expand their efforts. Teachers view participation as a way to encourage students to put their ideas into action and to measure the results. For example, Elizabeth Nafus, a second grade teacher at Harry S. Truman Elementary School in West Valley, Utah has participated in the program for three years.

The first year, under Nafus' and her second graders' leadership, the whole school began a recycling program – both at the school and at home. Students studied what could be recycled, set up appropriate recycling bins and collected the recycling in each classroom weekly. They also set up reusable item bins so that extra pieces of paper, pens, pencils, etc. would have a second life. Her class received an honorable mention that year.

The next year, her students studied how disposable water bottles are produced and chose to rid their school of them. The students worked to find donations of reusable water bottles and then provided each student in the school with one (Figure 6). They then calculated the amount of carbon they prevented from entering the atmosphere from the reusable water bottles, the energy it would take to fill them with water and the energy it would have taken to deliver the bottled water to their school. Again, her students received an honorable mention.

Figure 6. Energy reduction campaign in which every student was given a reusable water bottle.

The third year, her second grade students were determined to win. The class decided that their emphasis that year would be to get the students, and their families, to replace plastic and paper shopping bags with reusable bags. The students and their teacher sought donations from local businesses and each student in the school was given reusable shopping bags. The students then recorded the number of times they were used during the challenge. Students used math skills to determine how many plastic and paper bags they stopped using and the amount of energy they conserved. That year, they won!

About the Author

Christine Schmitz is the Education Curator at Utah's Hogle Zoo. She has worked in informal science education for over 30 years. She holds a bachelor's degree in biology from Scripps College and a master's degree in Curriculum and Instruction from Portland State University. She can be reached at cschmitz@hoglezoo.org.

Each year, "we tie it back to polar bears and mention climate change," Nafus said. This program is changing the school and their community. Four years later, students are still bringing their recycling to the school because they may not have recycling available where they live. Recently, a parent offered to donate bottled water for a school event. His daughter said, "NO!" Instead, they brought pitchers of water and paper cups. This year Nafus' and her students are thinking about how they can create a "No Idling" campaign at their school and in their community – helping to reduce emissions and improve the quality of the air they breathe.

Conclusion

Over the course of the Challenge, the Zoo's education staff have also created more in-depth teaching materials. This has culminated in Climate Care teaching kits and curriculum for elementary school teachers in our targeted school districts. The curriculum and supporting materials compare Utah's habitats and wildlife to Alaska's – using black bears and polar bears as iconic species. The goal is to help students better understand how interconnected these unique ecosystems are and how our actions can positively, or negatively, affect the animals, plants and people who make their homes there. To learn more about our Climate Care Kit, receive any of the teaching materials including pre- and post- tests, or more information regarding the Polar Bear Challenge please visit the website (http://uhzpolarbearchallange.org) or feel free to contact Utah's Hogle Zoo's education staff at http://www.hoglezoo.org/contact_us.