Buttonwood Park Zoo and New Bedford Symphony Orchestra Collaborate on Education Program

By Terry Wolkowicz and Carrie Hawthorne

© Buttonwood Park Zoo

What if a zoo and a symphony orchestra took a scientific concept like adaptation in motion and collaborated in a year-long program of connected learning for children? In fact, the concept of adaptation in motion is as integral to classical music as it is to evolutionary biology. By exploring a fundamental concept that authentically exists both in science and music, such a collaboration yields learning outcomes that far exceed what would have been possible in each organization alone.

The New Bedford Symphony Orchestra (NBSO) and Buttonwood Park Zoo in New Bedford, Mass., presented "Adaptations in Motion: Animal and Musical," a cross-discipline exploration of motion and adaptations to 40 elementary schools and more than 10,000 children in Massachusetts and Rhode Island during the fall and winter of 2015-16. The program explored and communicated these shared concepts through sight and sound, direct animal observations, locomotion graphs, scientific illustrations and classical music that moves and evolves identically to various forms of animal locomotion.

The curriculum followed the timeline of animal evolution, beginning with the swimming motion of Devonian fish, continuing through the amazing discovery of tiktaalik, marking one of the first species to adapt to move from life in water to crawling with its hind fins onto land, and culminating with modern day tetrapod locomotion of tree climbing, jumping, running and flight. The program also connected children to scientific illustration through a partnership and visit from Kaliopi Monoyios, scientific illustrator of tiktaalik for Neil Shubin's book, *Your Inner Fish*.

Throughout the program, the children used an analytical device that we called T.R.A.M (Tempo, Range and Motion). This anagram was used to guide the children's analysis of motion in music and in animals. Inside the Zoo, children were able to explore designated TRAMstops, where they could observe animal locomotion and hear music that moved just like the animal in that exhibit. A QR code placed on each TRAMstop sign launched a video of NBSO musicians playing classical music that demonstrated the same tempo, range and motion of each animal moving in front of them.

We used a magnetic graphing board called a TRAMboard to allow children to graph animal locomotion and then hear their graphs performed by the orchestra's musicians. In classroom visits, children were presented with three musical ideas on the TRAMboard that moved in a swimming and gliding motion. Each classroom then changed and adapted these ideas so that they moved like other forms of tetrapod locomotion that evolved as animals moved onto land, including crawling, climbing, jumping, running or flying. We collected these animal motion melodies and scored them for a new piece for orchestra, which was premiered for our students at the New Bedford Symphony Orchestra's Young People's Concerts. In this amazing musical piece, composed by children from the 40 elementary schools, we heard the evolution of tetrapod locomotion demonstrated and communicated through beautiful and inspiring music. This culminating event also featured videos of students analyzing animal and musical motion at the TRAMboard, original scientific illustrations and amazing videos of the Buttonwood Park Zoo animals.

Terry Wolkowicz is the education director at New Bedford Symphony Orchestra.
Carrie Hawthorne is the curator of education at Buttonwood Park Zoo.