

Educating the Imagination

ArtScience Designs for Learning That Matters

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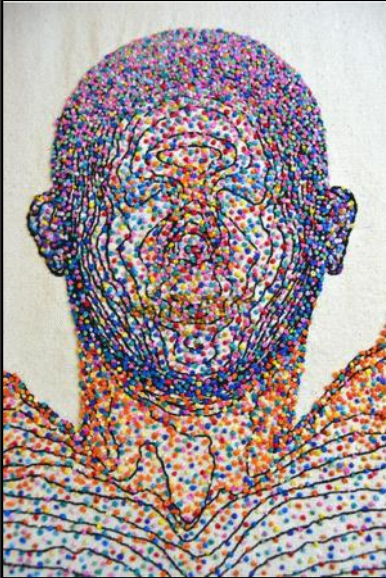
ArtScience

“ArtScience...*connects*. The future of human and civil society depends on these connections. ArtScience is a new way to explore culture, society and human experience that integrates synesthetic experience with analytical exploration. It is knowing, analyzing, experiencing and feeling simultaneously.”

(Root-Bernstein, Siler, Brown, Snelson in *Leonardo*, 44 (3), p. 192, 2011)

Scientific Disciplines

The Human Microbiome



“We’re not individuals, we’re colonies of creatures.”
Bruce Birren

Climate Change



“The cold gave me my language. The cold gave me my culture. The cold makes me who I am. Without it, I am nothing.”

Oscar Kawagley

Elevating Heterogeneity in Human Sense-Making

“The claim must increasingly be for the creative rather than the uniform, the search for possible worlds rather than simply acquiring actual worlds as previously defined or delineated by others. Widening the limits of what is perceived to be possible generates scientists and artists, science and art”.
(Shirley Brice Heath, 1986, p. 18)

“By the time they get to be adults, most kids have become frightened of being wrong... We stigmatize mistakes. And we're now running national education systems where mistakes are the worst thing you can make. And the result is that we are educating young people out of their creative capacities.”
(Sir Ken Robinson, TED Talk, June, 2006)

An ArtScience Pedagogy: Designing *for* Heterogeneity

- ⊗ Integrate thinking and making with practices of experimentation and critique as the foundation of expansive learning
- ⊗ Foster boundary-crossing thinking and making critical to understanding and acting on 21st century challenges represented in complex ecological domains such as climate change and the human microbiome
- ⊗ Transform historically privileged relationships to knowing and being by multiplying creative trajectories into meaningful STEM learning for youth who often find school science to be disengaging and alienating
- ⊗ Flatten hierarchies of authority and control in teaching and learning to support more horizontal and varied forms of participation linking youth and adults as thinkers and makers

The Water Studio

- Boundary-crossing thinking and making practices integrated with wide-ranging experimentation and critique



- Rising 9th and 10th graders from two urban schools who did not identify with or excel in school science

Learning in the Water Studio

End of First Day Qs

- ⊗ “Why does water create as well as destroy?”
- ⊗ “How is it possible for water to be scarce when there is so much of it on earth?”
- ⊗ “Why exactly is water the source of all life?”
- ⊗ “Why is there too much water where some people live and too little where other people live?”
- ⊗ “What does water have that everything needs?”

Final Responses

- ⊗ a mobile of the idea of a balanced, interdependent water planet
- ⊗ a multimodal dance on the dynamic movement and function of ocean eddies
- ⊗ a projection of a cartographic overlay depicting the temporal-spatial development & degradation of the Muddy River from colonial times to the present
- ⊗ a multimodal two voice poem, one being the Yellow River. the other Chinese citizens, expressing long evolving tensions related to economic development, aquatic ecology, and human development along the Yellow River

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Youth Reflecting on Learning

Water

“At least almost every single day someone brings up a topic and I’m just like, ‘Oh, I never thought of it that way.’ So it’s not like it’s always the same thing...I always leave here thinking about something related to water or that spins off of water.”

“Until this program I haven’t really thought about investigating water. Here a lot of peoples’ thoughts are in your head...it made me realize how much I could learn about water.”

“I’ve been intrigued because of all the things I didn’t really know about. It makes me more curious about the limitations of water and what water can do.”

Human Microbiome

“It’s very different from everything else we’ve done in the class. Out of the box– human microbiomes are very new, and no one’s been talking about it. No schools have been talking about it. It kind of sucks to have certain people not know about it because it’s so fascinating. I want other people to learn about it as much as I want to know about it.”

“It’s very emotional...there were some perfect moments when I would learn about bacteria and it made me really turn the world upside down ...especially ecology and how these things affect us, how we affect them. And how we’re so aggressive toward them sometimes, when really sometimes we need to embrace them...We’re living with them–we’re going through life with them, not without them.”

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Acknowledgments

Boston Arts Academy

**Cambridge Street Upper
School**

**Chèche Konnen Center
(TERC)**

Local Independent Artists

**The Broad Institute of
Harvard and MIT**

MIT/WHOI

**Red Eagle Soaring Youth
Theatre Company**

University of Washington

**Western Washington State
University**

**Indigenous Community
Artists**