



## **Teaching 'Diversity in Design and the Design Thinking Process through hands-on in-classroom prototyping (Resource Exchange, Diversity)**

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D'Andre Wilson-Ihejirika completed her B.Eng in Chemical Engineering at McGill University and her MASc. from the Centre for Management of Technology and Entrepreneurship (CMTE) at the University of Toronto. She worked for several years as a Professional Chemical Engineer in the Athabasca Oil Sands, before taking a Project Management role in Research & Innovation at York University. D'Andre is the founder the STEM education consulting initiative, BrainSTEM Alliance, whose vision is for every person to have the opportunity to be empowered by Science, Technology, Engineering and Math (STEM). D'Andre is also the co-founder of a non-profit in her home country of the Bahamas called BETA, Bahamas Engineering & Technology Advancement. D'Andre has won multiple awards including Toronto's Centre for Social Innovation 'Agents of Change' in 2011, Alberta Venture's 'Next 10' award in 2013, Top 50 under 50 for YMM Magazine in 2017 and SunCares Changemaker in 2019.



## **Resource Exchange – Handout**

<b>Title:</b>	Teaching ‘Diversity in Design’ and the Design Thinking Process through hands-on in-classroom prototyping
<b>Target Grade Level:</b>	6-8
<b>Target Age Range:</b>	11-14
<b>Expected Time-Frame</b>	2 hours
<b>Learning Objectives:</b>	Design Thinking, Engineering Design, Diversity
<b>Author Website:</b>	<a href="http://www.brainstemalliance.com">www.brainstemalliance.com</a>

### **Activity Summary**

This activity is designed to introduce the design thinking process, while also allowing fostering awareness of the importance of diversity. The activity is targeted towards grades 6-8 students (ages 11-14) but can be adjusted and modified for younger or older audiences.

The purpose of this activity is to help students understand the importance of empathy for a customer in design, as well as understanding how diversity can help create more innovative products.

Students will be introduced to the steps in the design thinking processes as well as some of the challenges currently faced in design for diverse populations.

Students will then be split into groups and randomly assigned a ‘task’, a problem they need to solve, as well as a ‘customer’, who they are solving the problem for.

Students will have the opportunity to go through the steps of the design thinking process to build a prototype. Materials for the prototype can include different materials available to the teacher and can be modified accordingly. Previous implementations have used [littlebits](#) along with various craft supplies.

The project could potentially be extended into a longer exercise where students have the opportunity to go out into the community and test their prototypes with potential customers, or scaled into an entrepreneurship activity where students launch their product as a business idea.



## **Background**

Below are some links to potential discussion points on challenges and opportunities for diversity in design. Additional topics can be discussed based on differing demographics (e.g. focus on women, focus on differing abilities, focus on economic status, focus on differing cultures, etc.)

- Teenager finds flaw in hand dryer design  
<https://www.cbc.ca/news/canada/calgary/calgary-student-nora-keegan-hand-dyer-research-decibel-1.5185853>  
Student discovers that hand dryers may be harmful to children's hearing as children have to stand too close due to their height and length of arms
- Improper Design of Cars for Women  
<https://jezebel.com/women-are-dying-in-car-accidents-because-the-only-femal-1836527298>  
Most cars not being designed with women in mind and can lead to safety implications for women, designs also rarely consider women of different sizes or pregnant women
- Bias in the design of artificial intelligence  
<https://www.usatoday.com/story/tech/2019/04/17/ai-too-white-male-more-women-minorities-needed-facial-recognition/3451932002/>  
Facial recognition software has difficulty recognizing darker skin tones, AI based recruitment tools discriminate against women
- Brainstorming better diversity in design  
<https://www.theguardian.com/commentisfree/2018/aug/27/architects-diversity-cities-designed-mothers>  
Looking at ways we might design a city if it including designers who were mothers, teens, or older persons.

*\*\*Additional information containing handouts for students to complete the Diversity in Design activity can be found on the BrainSTEM Alliance website or by contacting [info@brainstemalliance.com](mailto:info@brainstemalliance.com) .*