Water and Waste Water

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As a class, we determined the problem space of the project.

“SAIN sees the opportunity to create a interactive touring circuit in Huntingdon County, with the intent of increasing tourism and advancing awareness and education in the areas of STEM.”

Goal

To educate prospective students in new and innovative ways of water and wastewater treatment, to bring interest to STEM, bring tourism to the Juniata Area, and to make a profit for the stakeholders

Quantitative guidelines further specify our goal.

- Exhibit must fit within the confines of our design space
- Able to endure no less than one year of heavy use with minimal regular maintenance
- Easily replaceable/interchangeable parts
- Modular exhibits for ease of upgrade with technological innovations
- Create an educational experience that parallels the educational curriculum for middle and high school students

We generated multiple rough ideas as possible project solutions.

Harnessing water for heating and cooling

Electrolysis

Hydroelectric energy

Timeline of water treatment

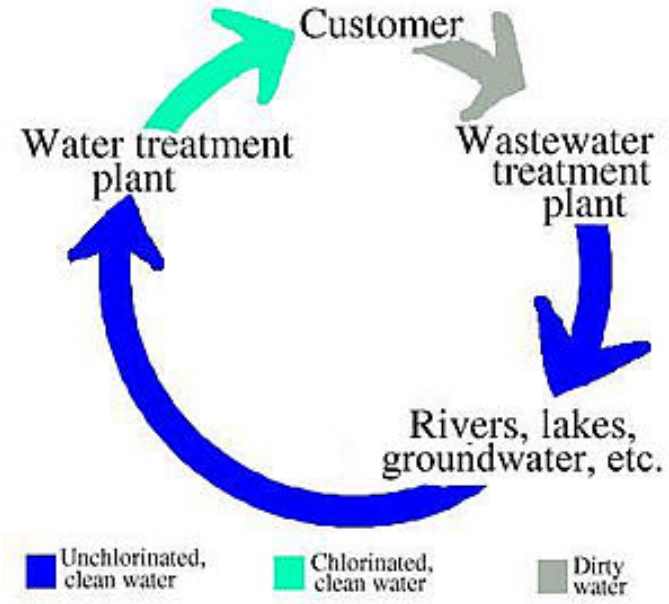
Water/Wastewater Cycle

Educational Water Sampling (EWS)

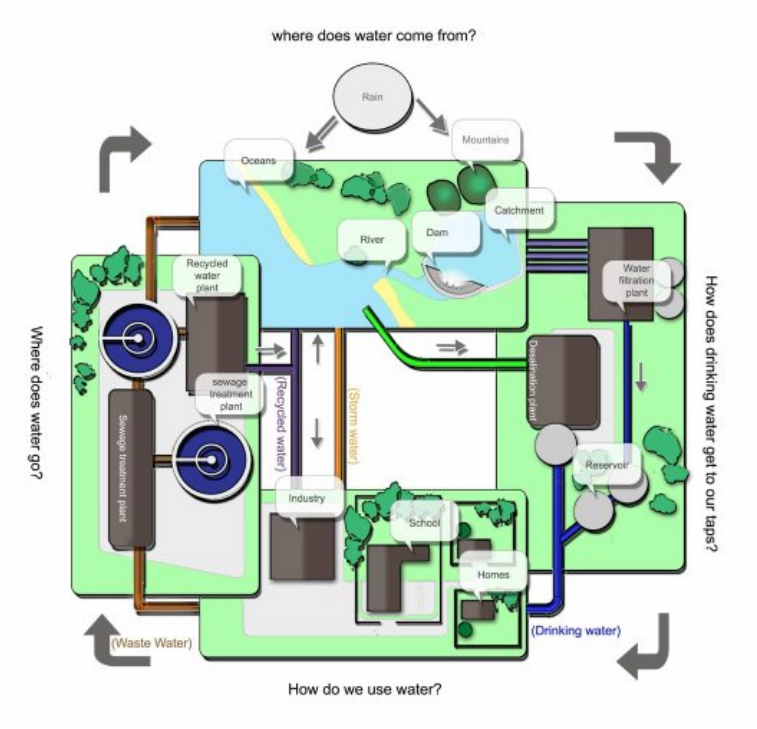
The combination of educational sampling and water cycle education was determined to be the superlative solution

			Concepts				
		Timeline		Cycle		Educational Sampling with Cycle	
Selection Criteria	Weight	Rating	Weighted Score	Rating	Weighted Score	Rating	Weighted Score
ease of maintenance	0.028	4	0.112	3	0.084	2	0.056
modularity	0.047	3	0.141	3	0.141	4	0.188
replaceable parts	0.077	5	0.385	3	0.231	2	0.154
innovative	0.224	1	0.224	2	0.448	5	1.12
dimensions	0.280	2	0.56	2	0.56	4	1.12
cirriculum match	0.345	2	0.69	2	0.69	4	1.38
	Total Score		2.112		2.154		4.018
	Rank		3		2		1
	Continue?		no		yes		yes

Design Solution- We found ideas that would meet our goal, and fulfilled the specifications.



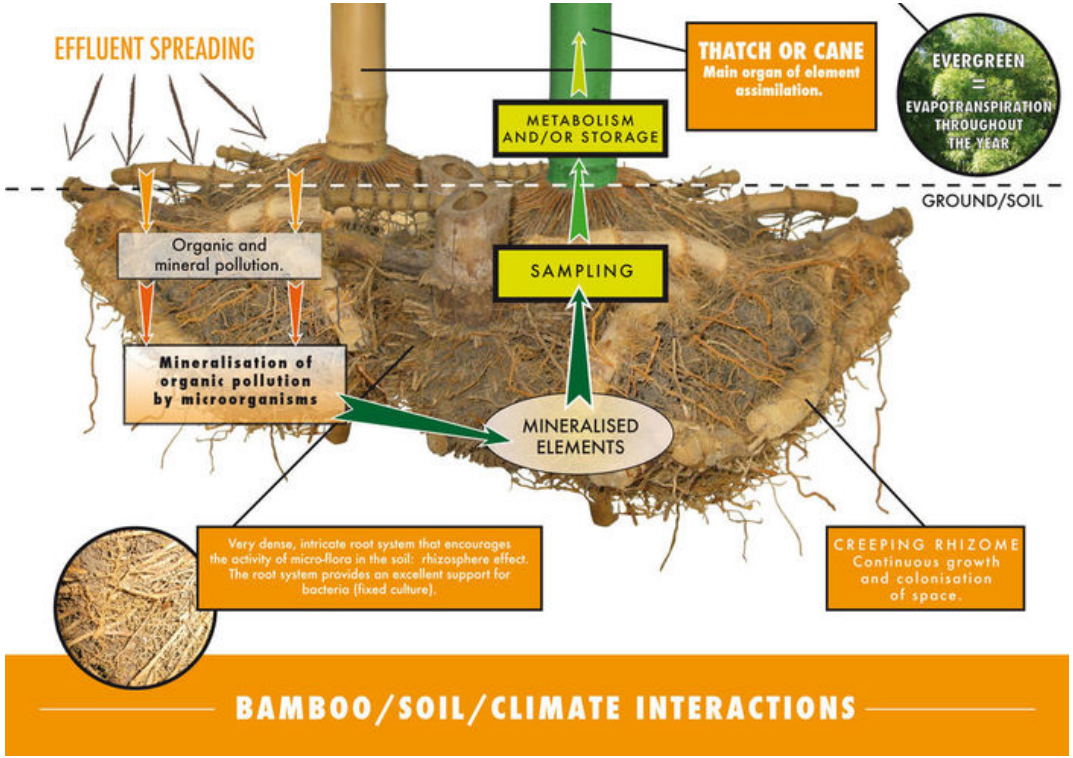
We will create an interactive water cycle, showcasing new and innovative ideas.



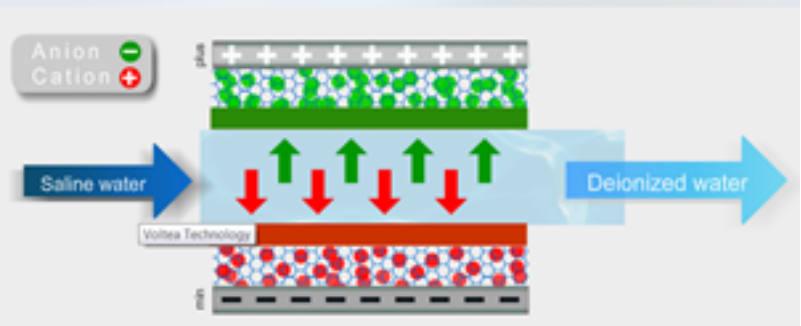
- We will focus on disposal, wastewater treatment, and water filtration (making it drinking water).

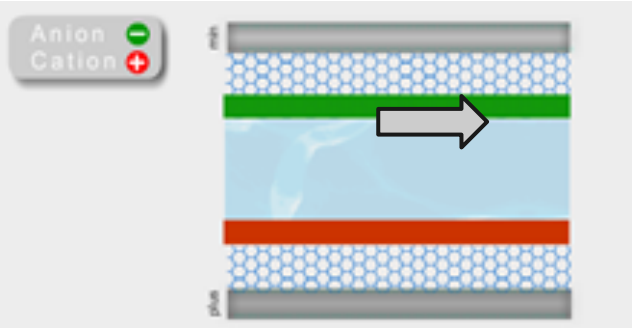
We will incorporate the Neorest 700H as a part of our innovative ideas.

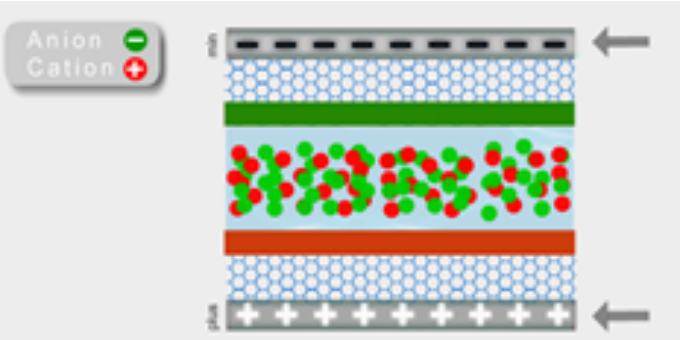
The incorporation of bamboo saves money, power, and naturally removes pollutants.



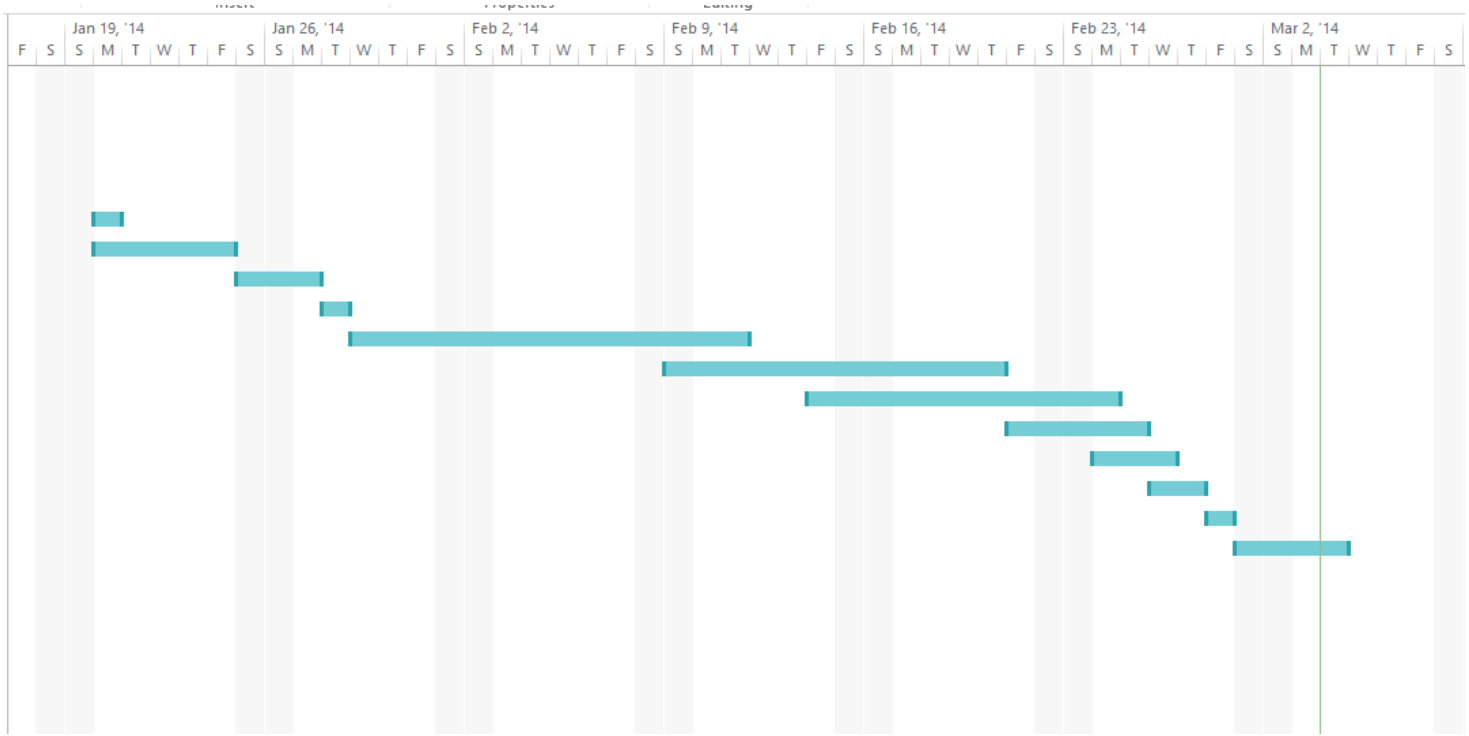
CapDi is an innovative idea that will save power, and money.







Appendix


Jan 19, '14
Jan 26, '14
Feb 2, '14
Feb 9, '14
Feb 16, '14
Feb 23, '14
Mar 2, '14
F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S

Appendix

Water/Wastewater Presentation				
	0.1 Begin Project	1 day	Mon 1/20/14	Mon 1/20/14
1.0 Determine Customer Need	1.1 Establish requirements	5 days	Mon 1/20/14	Fri 1/24/14
	1.2 Research school curricula	2 days	Sat 1/25/14	Mon 1/27/14
	1.3 Benchmarking	1 day	Tue 1/28/14	Tue 1/28/14
	1.4 Prioritize customer needs	10 days	Wed 1/29/14	Tue 2/11/14
	1.5 Define problem space	10 days	Sun 2/9/14	Thu 2/20/14
2.0 Generate Concepts	2.1 Research guidelines	7 days	Fri 2/14/14	Mon 2/24/14
	2.2 Generate concepts	3 days	Fri 2/21/14	Tue 2/25/14
3.0 Analysis	3.1 Decision Matrices	3 days	Mon 2/24/14	Wed 2/26/14
	3.2 Analyze in detail	2 days	Wed 2/26/14	Thu 2/27/14
	3.3 Final selection	1 day	Fri 2/28/14	Fri 2/28/14
4.0 Presentation	Presentation preperation	3 days	Sat 3/1/14	Tue 3/4/14

Appendix

	Pairwise Comparisons							
	ease of maintenance	modularity	replacable parts	innovative	dimensions	curriculum match	Row Totals	Row total/total
ease of maintenance	1	0.50	0.33	0.20	0.17	0.13	2.33	0.028
modularity	2	1.00	0.50	0.20	0.14	0.13	3.97	0.047
replaceable parts	3	2.00	1.00	0.14	0.17	0.13	6.43	0.077
innovative	5	5.00	7.00	1.00	0.33	0.50	18.83	0.224
dimensions	6	7.00	6.00	3.00	1.00	0.50	23.50	0.280
curriculum match	8	8.00	8.00	2.00	2.00	1.00	29.00	0.345
						Total	84	