

RIDGEWOOD HIGH SCHOOL InvenTeam

Solar Aqua Tech (SAT)

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LEMELSON-MIT



Lemelson-MIT InvenTeams® Grant Initiative

InvenTeams consist of high school students, teachers and mentors

Grants up to \$10,000 are given to InvenTeams to conceptualize, design and build their own inventions

InvenTeams will present, showcase, and celebrate working prototypes at the Lemelson-MIT EurekaFest in June

LEMELSON-MIT InvenTeams HIGH SCHOOL TEAMS AWARDED LEMELSON-MIT INVENTEAM® GRANTS FOR INVENTION PROJECTS

4 INVENTIONS FOR ENVIRONMENTAL SUSTAINABILITY	Braham High School (Braham, Minn.) System to wash clothing in zero gravity, thereby reducing waste in space	H.H. Dow High School (Midland, Mich.) Device to create drain covers which open only in the presence of moisture
4 INVENTIONS FOR HEALTH	Energy Institute High School (Houston, Texas) System to repurpose waste PLA 3D printer filament	Landmark School (Prides Crossing, Mass.) Device to monitor near-shore ocean environmental variables
5 INVENTIONS FOR SAFETY	Gilbreath-Reed Career and Technical Center (Garland, Texas) System to sanitize firefighters' boots to prevent the spread of communicable diseases	Ridgewood High School (Ridgewood, N.J.) System to generate hydrogen peroxide and sanitize water in a reusable water bottle
	Middleton High School (Tampa, Fla.) System to administer and monitor prescription medicine-taking in senior homes	Smithtown High School West (Smithtown, N.Y.) Device to monitor social distancing for students with autism spectrum disorders
	The Archer School for Girls (Los Angeles, Calif.) System to detect embers and actuate a roof sprinkler system	Charles R. Drew Senior Academy (Atlanta, Ga.) Device to record police-civilian interaction in personal automobiles
	Benilde St. Margaret's (St. Louis Park, Minn.) Device to extend reaching capabilities for people using wheelchairs	Quarry Lane School (Dublin, Calif.) System to connect a basketball referee's whistle with player-worn feedback system
		Omro High School (Omro, Wis.) Device to measure lake-ice thickness and crowdsourcing a map

13 TEAMS of high school students from across the US

USING AN ONLINE PLATFORM TO STAY CONNECTED THROUGHOUT THE SCHOOL YEAR

AWARDED UP TO 10K DOLLARS FOR INVENTION PROJECTS

APPLICATIONS ARE NOW OPEN FOR NEXT YEAR
LEARN MORE: www.lemelson.mit.edu/inventeams
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Ridgewood High School InvenTeam



Ridgewood High School InvenTeam



Prof. Shu Hu, Yale University,
2/2020



Ridgewood Water
3/2020



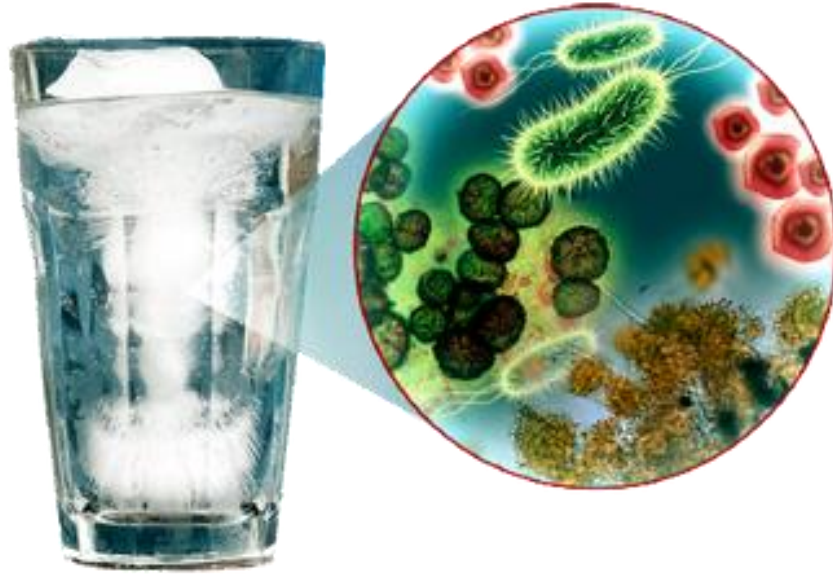
STEAM TANK



**THOMAS EDISON
PITCH CONTEST**

By Edison Innovation Foundation

Background Research



Water contaminated with bacteria and viruses can transmit life-threatening diseases.

“Cracked Pipes, Frozen Wells, Offline Treatment Plants: A Texan Water Crisis”
<https://www.nytimes.com/2021/02/18/us/texas-water-crisis>

Sustainably approved



Background Research

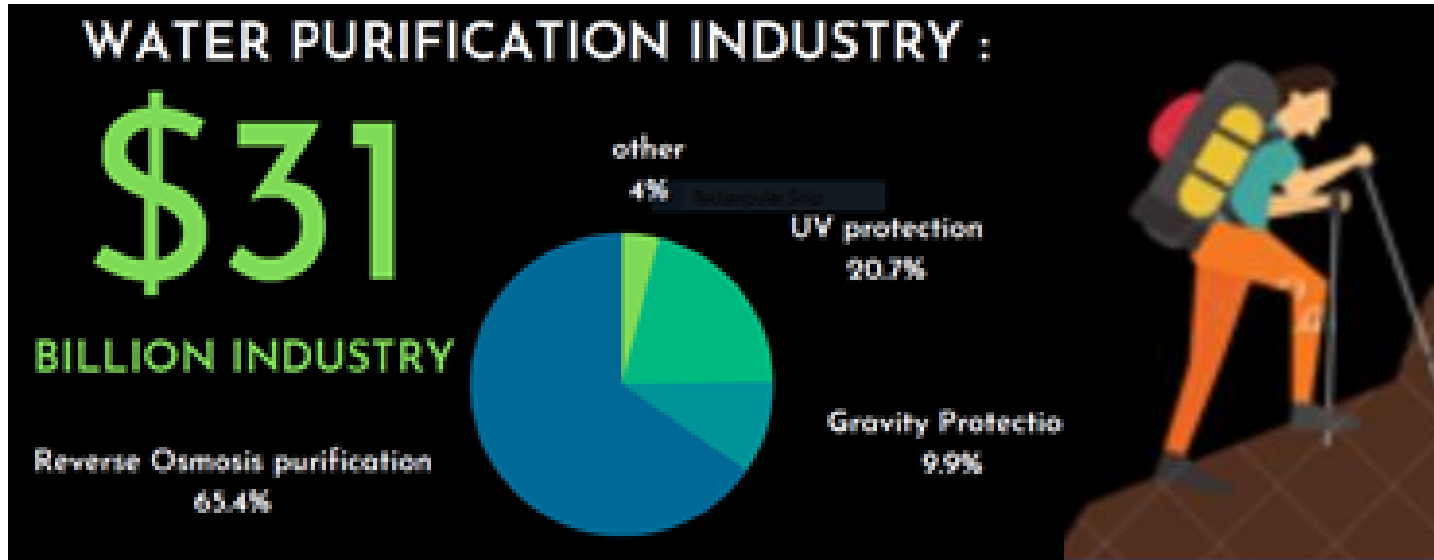
Portable



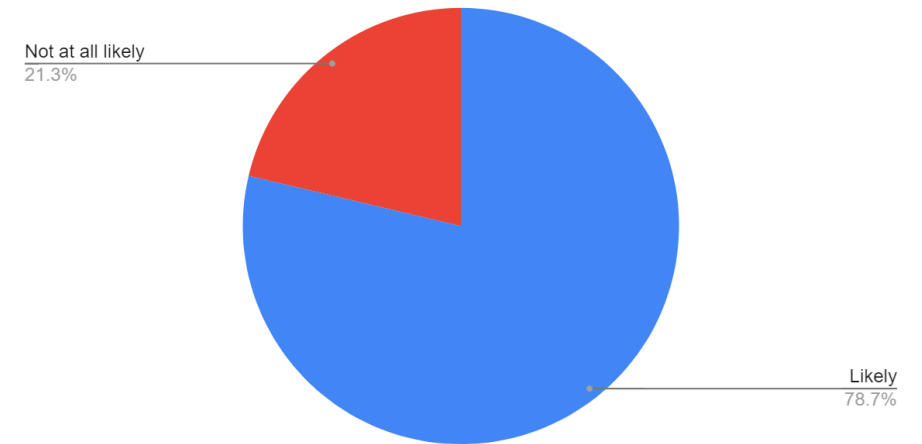
On Demand

The Solar Aqua Tech turns dirty water into safe drinking water.

Intended Beneficiaries



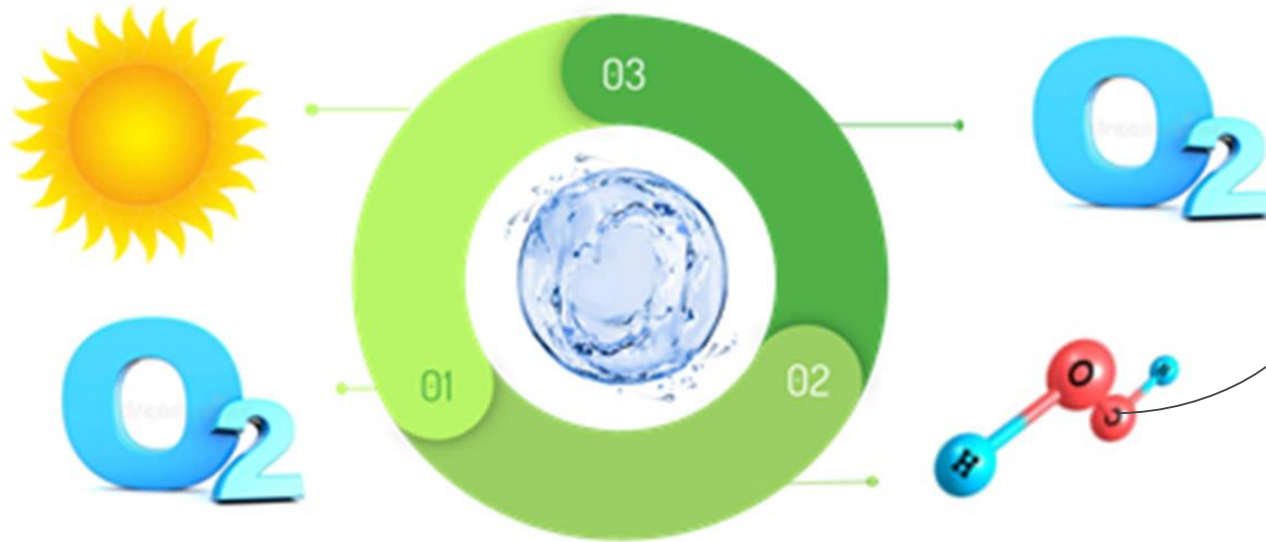
How likely are you to replace your current method of sanitation (ex. boiling water, iodine/chlorine tablets, pump water filters)...



We conclude that the SAT water bottle is unique and useful.

SOLAR AQUA TECH

is novel, sustainable and attainable



Hydrogen peroxide can sanitize water.

Invention Statement

Inventing a portable SAT water bottle for hikers featuring:

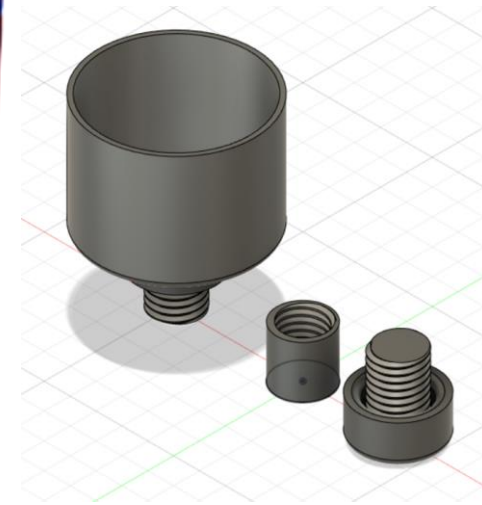
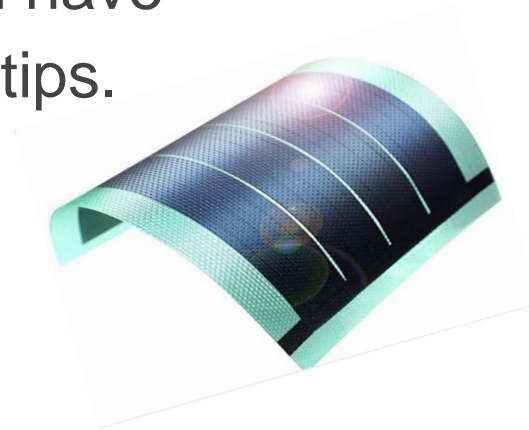
- ❖ Novel electrodes
- ❖ On-demand hydrogen peroxide production
- ❖ Certified bacteria-free efficiency in less than 30 minutes




Invention Statement

- ❖ Powered by a 9V battery rechargeable with flexible solar films
- ❖ Fitted with a prefilter and UVC LED in a 24 oz. Stainless Steel bottle

At a cost of about \$90, users can have safe drinking water at their fingertips.



Certified Bacteria Test



Ridgewood Water
Ridgewood Water 131 North Maple Avenue, Ridgewood NJ 07450

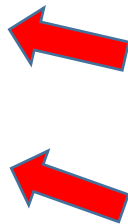
CHAIN OF CUSTODY

CLIENT:	RIDGEWOOD WATER #PWSID NJ0251001
ADDRESS:	399 GODWIN AVE MIDLAND PARK NJ, 07432
PHONE:	(201) 670-5526
EMAIL:	bmcMahon@ridgewoodnj.net

PAGE _____ OF _____

E2 SUBMITTED BY/DATE
METHOD SM9223B 24 HR Results

SAMPLE ID: FOR LAB ONLY	SAMPLE SOURCE	DATE sample taken	TIME sample taken	FOR LAB USE ONLY			24 Hour Results	
				DATE of Coli-ert Test	TIME	Tested By	3:00 TOTAL COLIFORM	3:14 E.COLI
	RWD H.S. Diamond Brook RAW	3/10/21	11:18	3/10/21	14:25	RF	+	+
	RWD H.S. Diamond Brook 15 min TREATED	↓	↓	↓	14:26	↓	Absent	Absent
	RWD H.S. Diamond Brook 30 min TREATED	↓	↓	↓	14:27	↓	Absent	Absent
	RWD H.S. Diamond Brook 60 min TREATED	↓	↓	↓	14:28	↓	Absent	Absent
	Temp: _____ Po4: mg/L _____ Total Cl2: mg/L _____ Free Cl2: mg/L _____							
	Time: _____ Time: _____ Time: _____ Time: _____							
	Temp: _____ Po4: mg/L _____ Total Cl2: mg/L _____ Free Cl2: mg/L _____							
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	Temp: _____ Po4: mg/L _____ Total Cl2: mg/L _____ Free Cl2: mg/L _____							
	Time: _____ Time: _____ Time: _____ Time: _____							
RELINQUISHED BY (print)	Signature: <i>Ryan Ferry</i>	DATE	3/10/21	RECEIVED BY (print)	Signature: <i>Ryan Ferry</i>	Samples Read By: <i>R. Ferry</i> 3/11/21 14:30		
Sample Temp upon receipt:	23°C	Time	14:20	COMMENTS/SPECIAL INSTRUCTIONS				



The 15 minute SAT sample was certified by Ridgewood Water to be Total Coliform & Ecoli free!

Trials & Failures



"When you have exhausted all possibilities, remember this - you haven't... The most certain way to succeed is to try just one more time." ~ Thomas Edison

Next Steps

Technical

- Make the electrode system more durable.
- Integrate the mechanical and electrical components into SAT water bottle.
- Field test the SAT water bottle with stream water from Diamond Brook. .

Finance

- Continue to do meaningful spending for the next prototype and find ways to save money

Communication

- Continue to build relationships within the community



Solar Aqua Tech

Questions?

- Type your question into the chat box
- <https://forms.gle/1Y4Z4kZKj3D5pQrT8>
- ridgewoodinventeam@gmail.com