Methods Part 1: Microplastic Removal

(using magnetite)

[redacted]

INDEPENDENT VARIABLE

3 glitter sizes

DEPENDENT VARIABLE

Percent mass of glitter remaining after removal

CONTROL GROUP

No glitter extraction

PURPLE GLITTER **1.06 mm**

GOLD GLITTER **2.54 mm**

RED GLITTER **5.00 mm**

Methods Part 2: BPA Removal

(using activated carbon)

INDEPENDENT VARIABLE

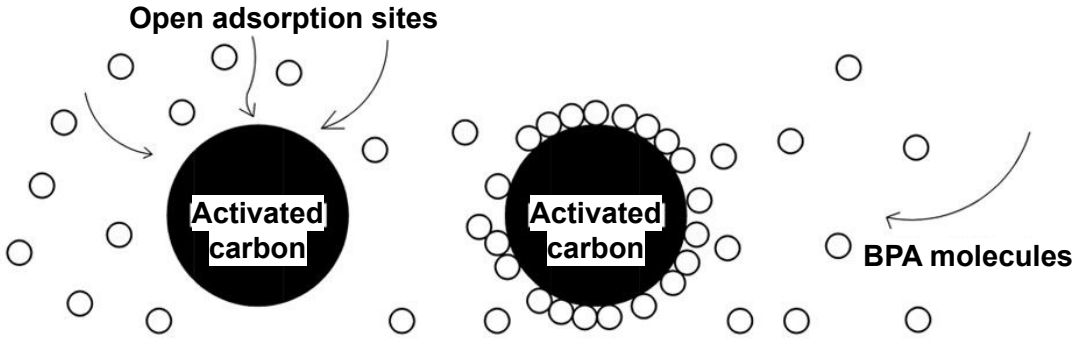
Activated carbon extraction of BPA

DEPENDENT VARIABLE

Absorbance (Colorimeter reading)

CONTROL GROUP

BPA in water without being removed by activated carbon



During adsorption, BPA molecules stick onto the surface of the activated carbon.

BPA Removal Method

STEP 1
Calibrate colorimeter with control group

STEP 2
Dissolve 0.07g BPA in 3g acetone

STEP 3
Add BPA solution to 250 mL distilled water

STEP 4
Pour solution over 20g activated carbon in coffee filter

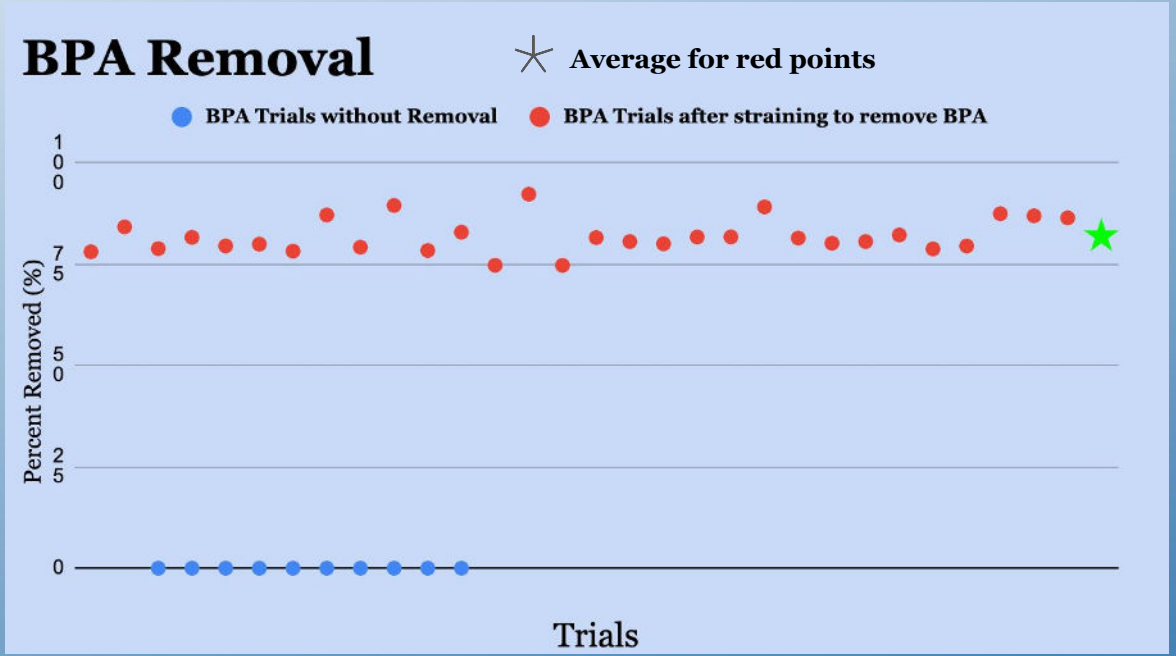
STEP 5
Fill cuvette and test absorbance

STEP 6
Dispose water safely in the Chemistry Lab at my high school

BPA Removal Data Analysis

30 TRIALS
82% of BPA removed

T Test Results:
P-value 0.0001
SEM: 0.75



Microplastic Removal Data Analysis

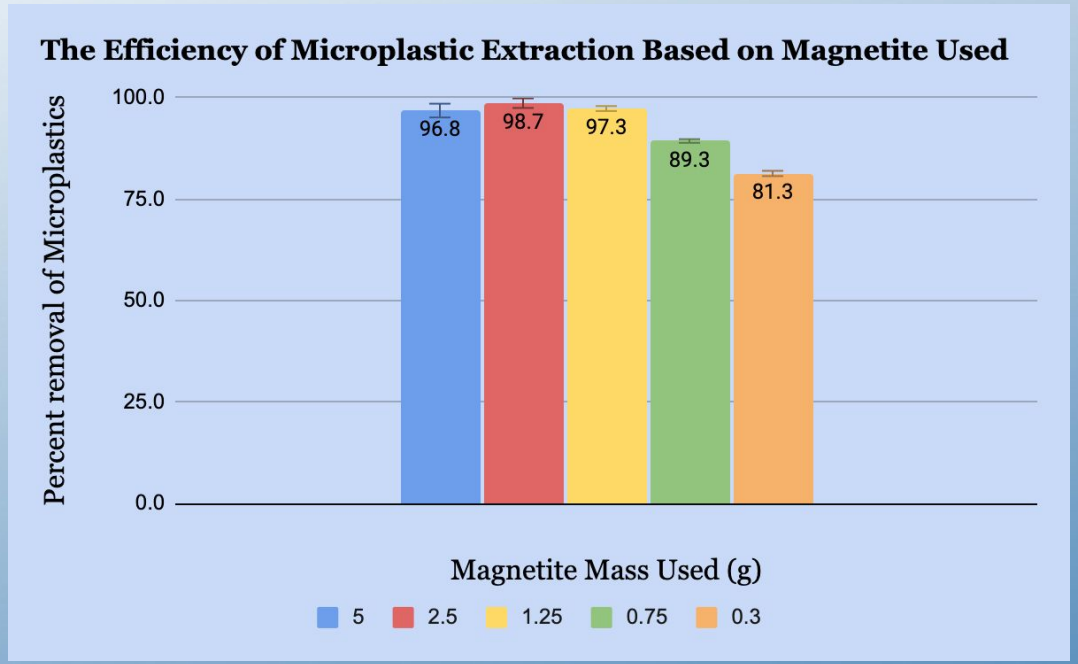
Ttest P-value 0.0001

60 trials total. 20 trials per glitter size.

Glitter was strained on paper towel in order to collect and mass. Combined mass of glitter remaining was averaged over 20 trials.

Magnetite Cost Optimization

Optimizing the amount of magnetite used drastically lowers the cost while maintaining efficacy.



40 trials total testing 5 different sizes.

$1 of magnetite

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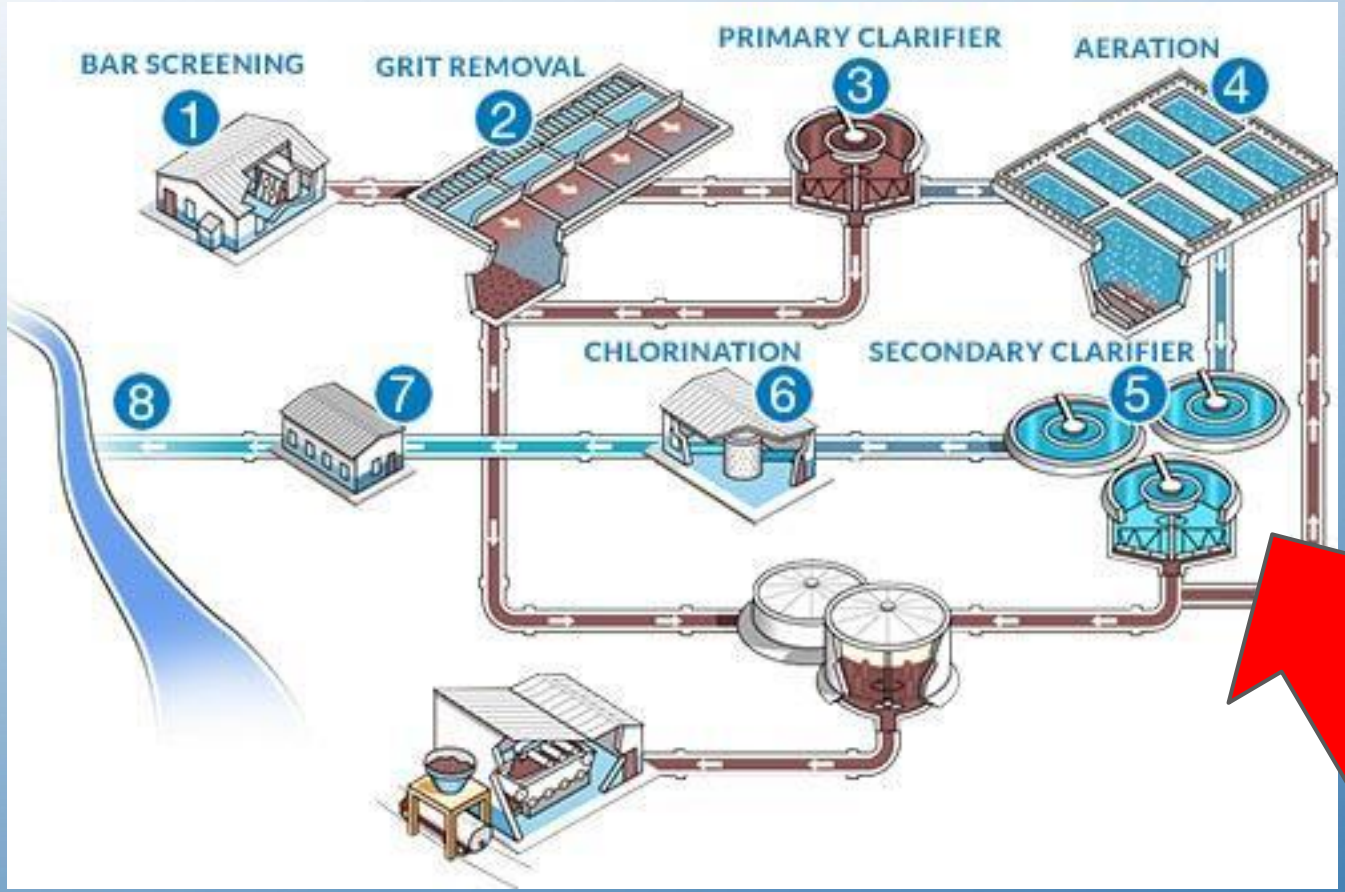
500 gallons purified

ANOVA

P-value 0.00022

Applications in Wastewater Treatment



Applications in Aquatic Farming