TEAM: ARMAAN B ., ETHAN H., ANJAN B., RYAN L.; MIDDLE COLLEGE HS; ADVISOR: MRS. FUNKHOUSER; UOP

# AI-POWERED PLANTER KIT

## OBJECTIVES

- UNITED NATIONS GOAL 2: ZERO HUNGER,
- NEARLY 2.4 BILLION PEOPLE FACED MODERATE TO SEVERE FOOD SHORTAGES AS OF THE YEAR 2022,
- PRIMARY OBJECTIVE: CREATE A PLANTING KIT THAT PROVIDES ORGANIC, HEALTHY, AND SUSTAINABLE FOOD TO LOW-INCOME HOUSEHOLDS
- SECONDARY OBJECTIVE: THAT DOES NOT REQUIRE MAJOR EXPENSES OR COSTS TO RUN

## PROBLEM STATEMENT

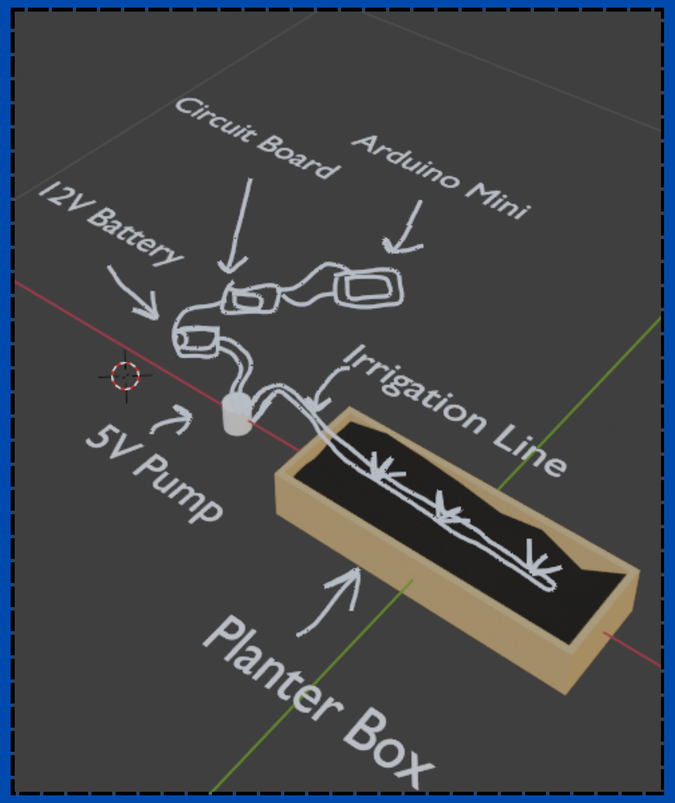
THE PROBLEM THAT PEOPLE FACE IS A LACK OF FOOD SECURITY IN LOW INCOME FAMILIES AND DEVELOPING NATIONS.

## USER REQUIREMENTS

- USER NEEDS STABLE SOURCE OF FOOD FOR CHEAP BUT ALSO NEEDS TO BE ABLE TO WORK WITHOUT CONSTANT HUMAN MONITORING.
- PLANTER BOXES USES AI TO WATER AND TRACK INFO IN THE PLANTER BOX MONITORING IT FOR YOU WHILST YOU DO OTHER THINGS.

## TESTING PROCESS

- STEP 1: ATTACHED ELECTRONICS TO PLANTER POT
- STEP 2: STARTED CODE COMPILER AND WROTE DOWN OUR OBSERVATIONS
- STEP 3: DETERMINED WHAT WENT RIGHT OR WRONG AND DISCUSSED HOW WE COULD IMPROVE OR FIX THE DESIGN




A PLANTER BOX WITH A PUMP/WATERING SYSTEM AND ARDUINO TO CONNECT TO PHONE OPERATING SYSTEM

THE MAIN BODY OF THE PLANTER BOX COMPOSED OF REINFORCED RECYCLED PLASTIC OR WOOD

## DESIGN PROCESS

- WE IDENTIFIED THE PROBLEM WE FACED (FOOD SECURITY)
- WE RESEARCHED ABOUT SOLUTIONS AND LOOKED AT ALTERNATIVES TO OUR PLANTER IDEA
- WE THEN CREATED BLUEPRINTS AND SET UP A GITHUB DESIGN CENTER TO HELP US CODE AND DESIGN THE PRODUCT
- WE USED BALSA WOOD TO CREATE THE INITIAL BOX, WHICH WE THEN REINFORCED
- THEN WE USED ARDUINO COMPONENTS AND THE ARDUINO CLOUD/VISUAL STUDIO CODE TO CREATE AND CODE THE ELECTRONICS
- WE TESTED THE PRODUCT, THEN DID APPROPRIATE DEBUGGING
- WE DECIDED TO SHIFT FROM PLANTER BOX TO PLANTER KIT ALLOWING USERS TO USE THEIR OWN PLANTERS

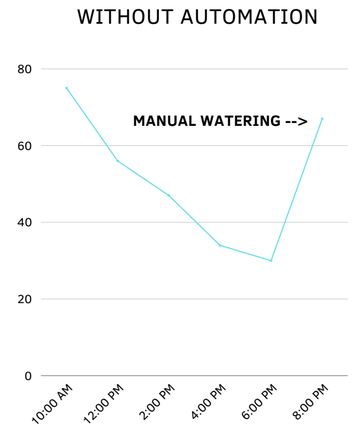
## CONCLUSION

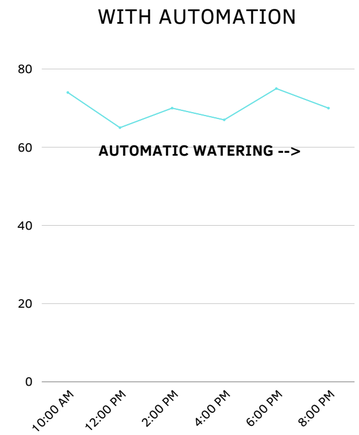
WE SUCCEDED IN CREATING A PLANTING KIT THAT ASSISTS LOW-INCOME HOUSHOLDS. WE ALSO BELIVE THAT WE MADE IT AS CHEAP AS POSSIBLE ALLOWING FOR LOW INCOME FAMILIES AND PEOPLE TO AFFORD IT. OUR NEXT STEP IS TO MAKE THE DESIGN MORE COMPACT AND GET HOUSING FOR THE ELECTRONICS

## FEEDBACK FROM LOCALS (STOCKTON CA)

| Data from locals | Wants planter to send notifications via an app | Wants planter to be self sustained, with no notifications. |
|---|---|---|
| # of people | 30 | 14 |

## SOIL MOISTURE WITH/WITHOUT AUTOMATION




## RESULTS

IMPROVED THE USERS ABILITIES TO WORK AND CULTIVATE HEALTHY CROPS IN A SMALL SET SPACE WITHOUT HAVING TO BE CONSTANTLY MONITORED.