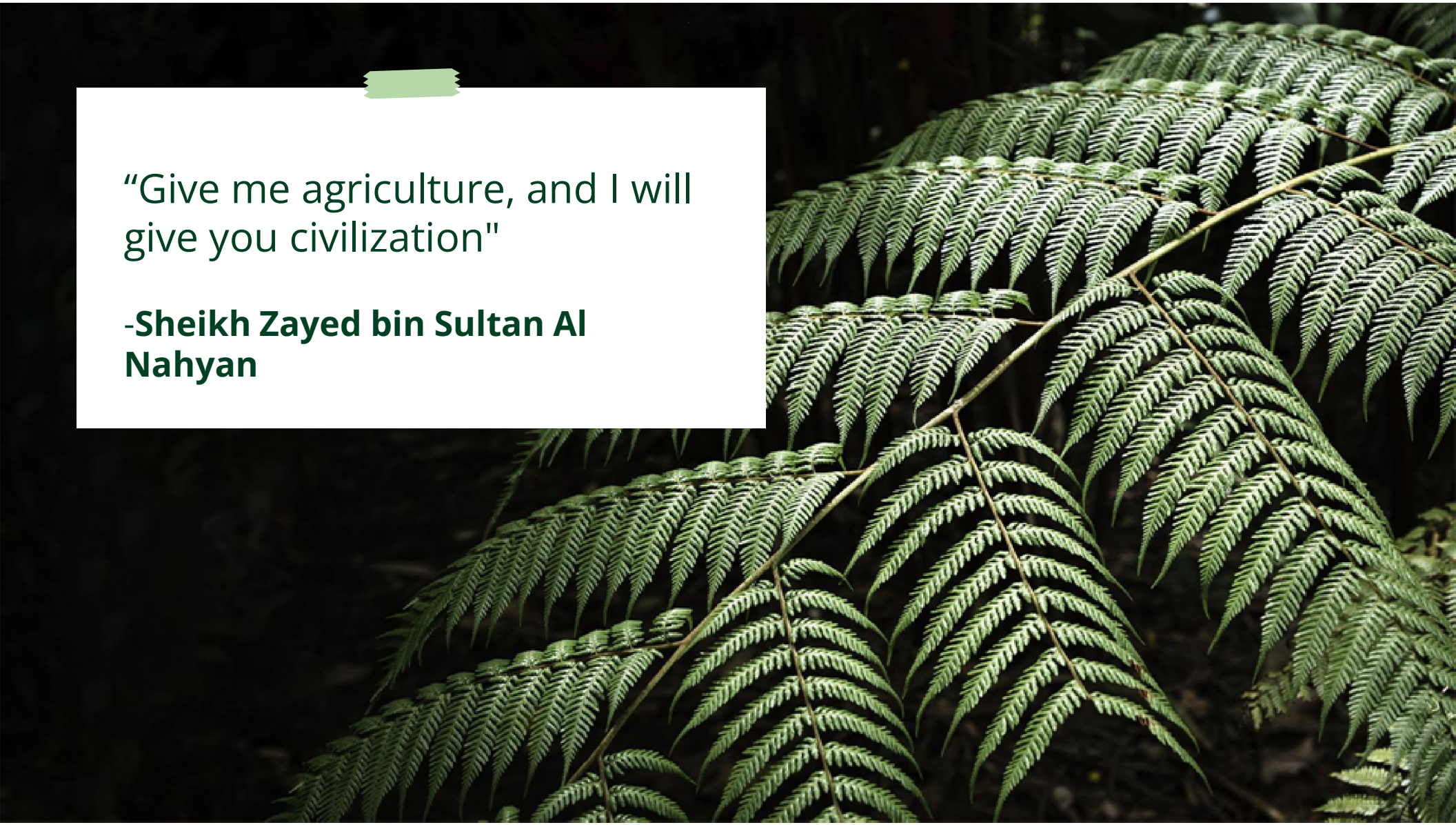

"Future Farmers: Growing Minds & Greens with Hydroponics"
PROJECT INITIATION BY MAZRA CARE



“Give me agriculture, and I will give you civilization"

-**Sheikh Zayed bin Sultan Al Nahyan**

Program Overview

AGE GROUP	LEARNING THEME	SYSTEM TYPE	KEY LEARNING OUTCOMES
KG – GRADE 3	Sensory & Lifecycle Learning	Student Hydroponic System (All-in-One)	Observation, curiosity, responsibility
GRADE 4 – 6	Observation & Recording	Observation Unit	Experimentation, data collection
GRADE 7 – 9	Nutrient Science	Vertical Nutrient System	System design, analytical thinking
GRADE 10 – 12	Business & Research	Modular Hybrid System	Entrepreneurship, sustainability, innovation

Educational & Agricultural Relevance:

KINDERGARTEN–GRADE 3

“My First Farm” – Sensory & Lifecycle Learning

Basic plant lifecycle, colors, shapes, and sensory interaction with plants.

GRADE 4–6

“Junior Agronomist” – Observation & Recording

Growth tracking, nutrient cycles, introduction to water management.

GRADE 7–9

“Future Scientist” – Nutrient Science & System Design

Experimentation with nutrient solutions, climate effects, basic agri-economics.

GRADE 10–12

“Young Entrepreneur” – Yield, Business & R&D

Business modeling, sustainability reports, yield optimization, agri-entrepreneurship.

GROUP 1: KG – GRADE 3

“My First Farm” – Sensory & Lifecycle Learning

Concept:

Designed for early learners to explore nature through touch, sight, and observation. The “My First Farm” hydroponic unit helps children understand how plants grow — from seed to harvest — in a safe, engaging environment.

Learning Outcomes:

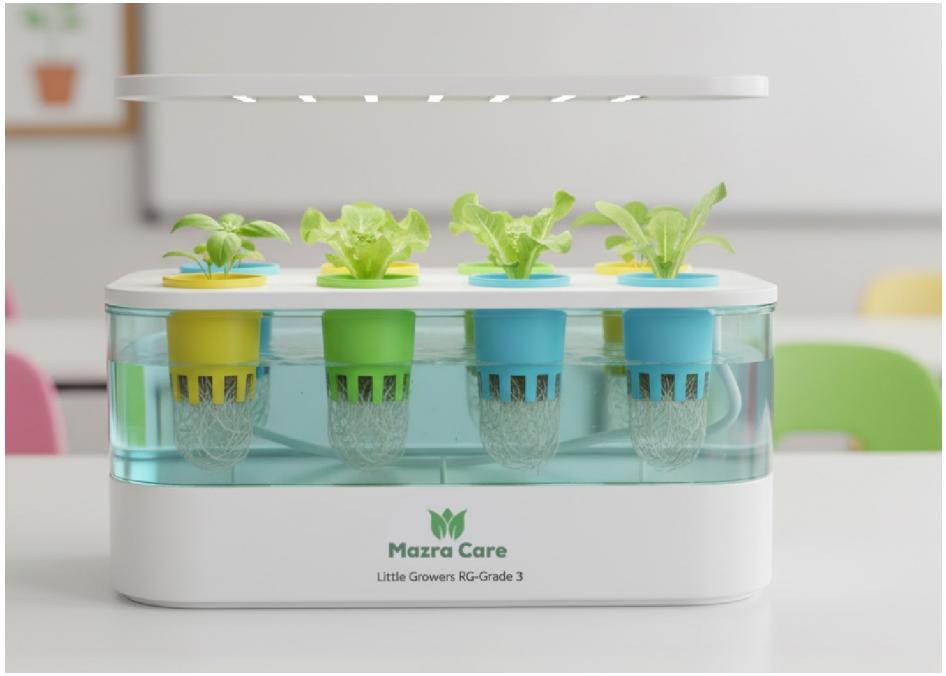
Basic understanding of plant growth stages
Awareness of water conservation and sustainability
Development of patience, care, and responsibility
Early exposure to clean food and green living

GROUP 1: KG – GRADE 3

System Features:
Child-safe compact design (non-toxic materials, rounded edges)
Transparent nutrient tank for visual understanding
Built-in LED lighting to simulate daylight
Simplified water and nutrient control
Tool-free setup for classroom use

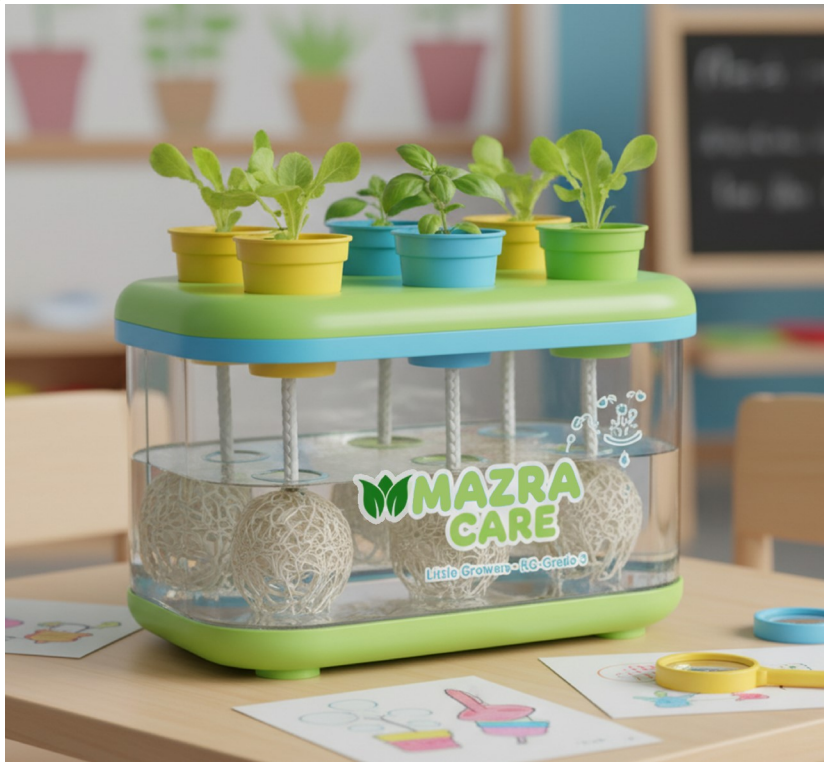
Crops Included:
Lettuce
Basil
Mint

GROUP 1: KG – GRADE 3



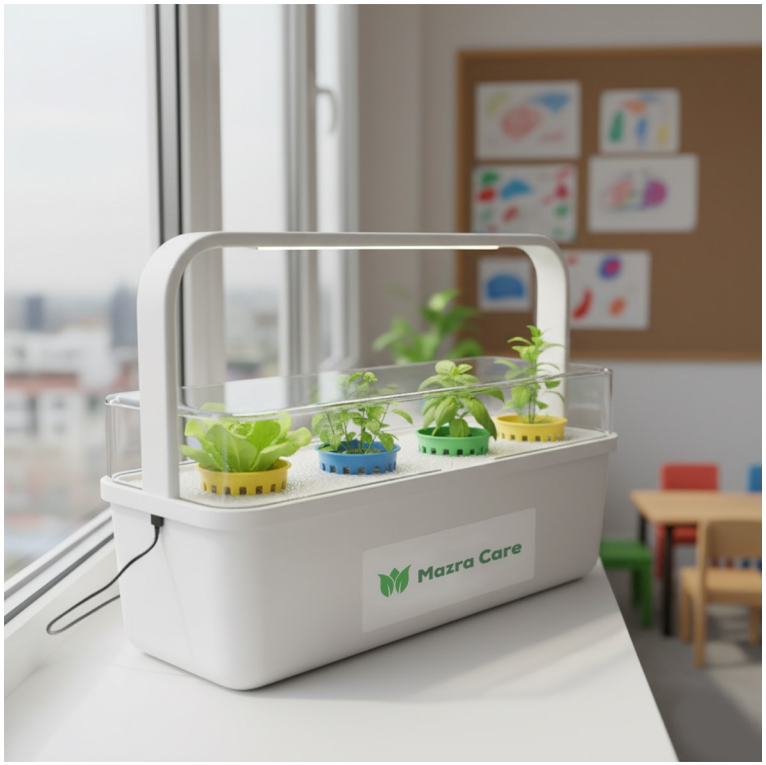
FEATURES	SPECIFICATION
Name	
Size	40cm x 20cm x 30cm
Capacity	8–12 plants
Lighting	Full-spectrum LED grow light
Material	Food-grade ABS plastic
Power	12V plug-in safe adapter
Water Cycle	Automatic circulation (quiet pump)

GROUP 1: KG – GRADE 3



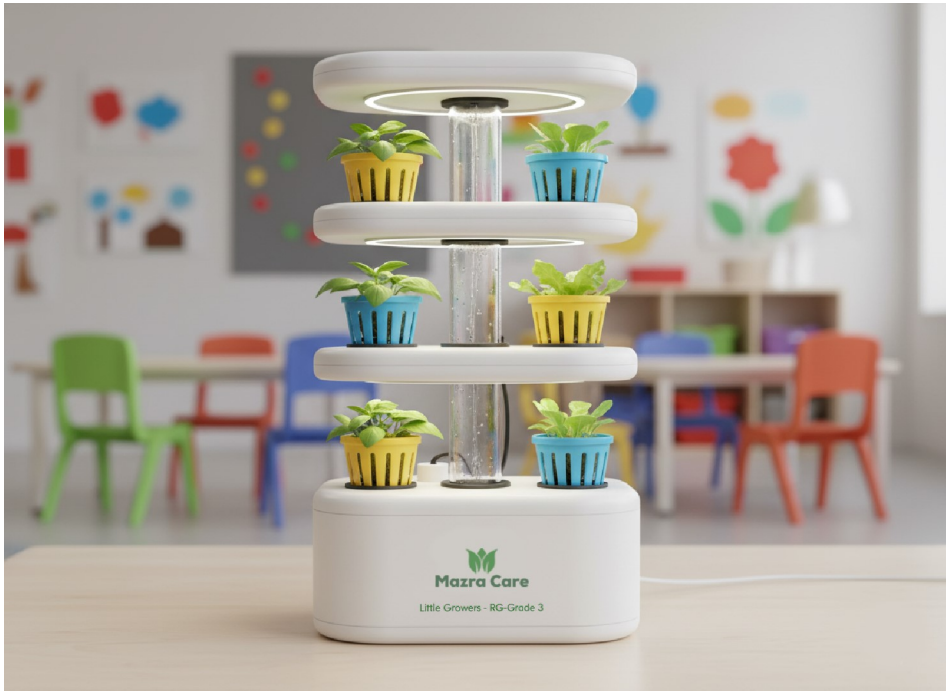
FEATURES	SPECIFICATION
Name	
Size	30cm x 20cm x 35cm
Capacity	6–12 plants
Lighting	Full-spectrum LED grow light
Material	Food-grade ABS plastic
Power	12V plug-in safe adapter
Water Cycle	Automatic circulation (quiet pump)

GROUP 1: KG – GRADE 3



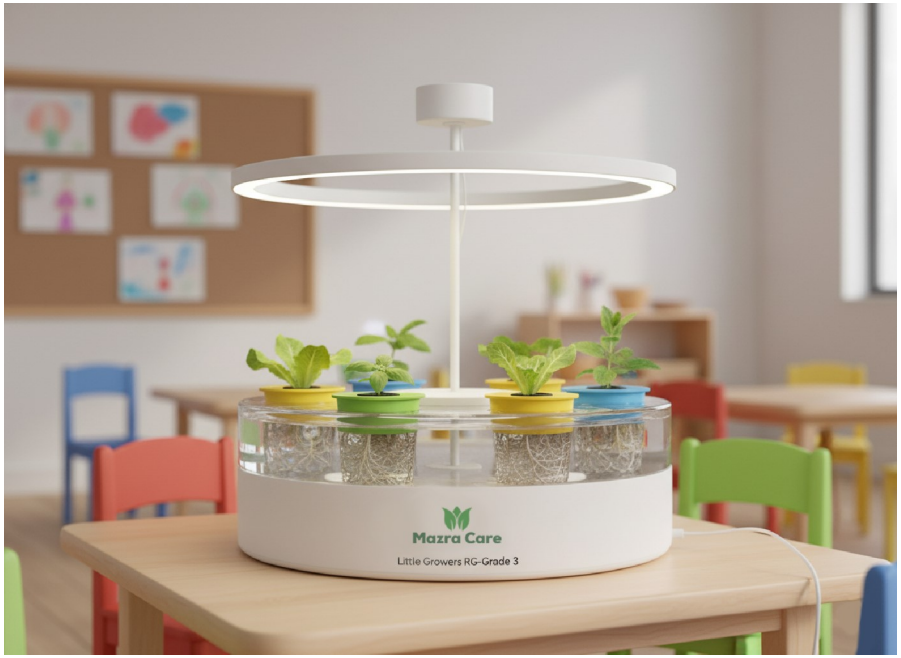
FEATURES	SPECIFICATION
Name	
Size	35cm x 15cm x 35cm
Capacity	6–12 plants
Lighting	Full-spectrum LED grow light
Material	Food-grade ABS plastic
Power	12V plug-in safe adapter
Water Cycle	Automatic circulation (quiet pump)

GROUP 1: KG – GRADE 3



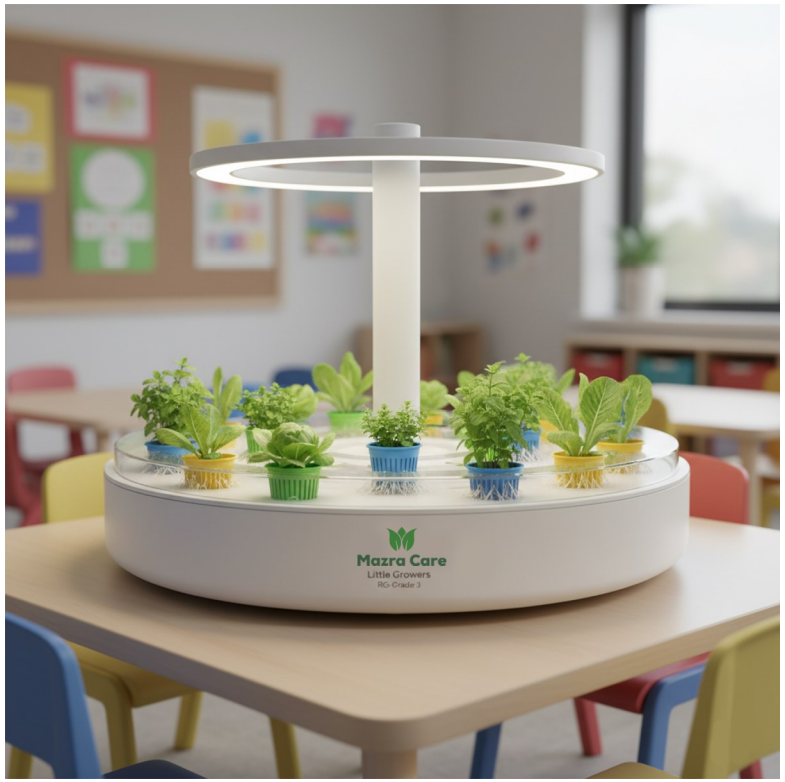
FEATURES	SPECIFICATION
Name	
Size	25cm x 15cm x 45cm
Capacity	12–18 plants
Lighting	Full-spectrum LED grow light
Material	Food-grade ABS plastic
Power	12V plug-in safe adapter
Water Cycle	Automatic circulation (quiet pump)

GROUP 1: KG – GRADE 3



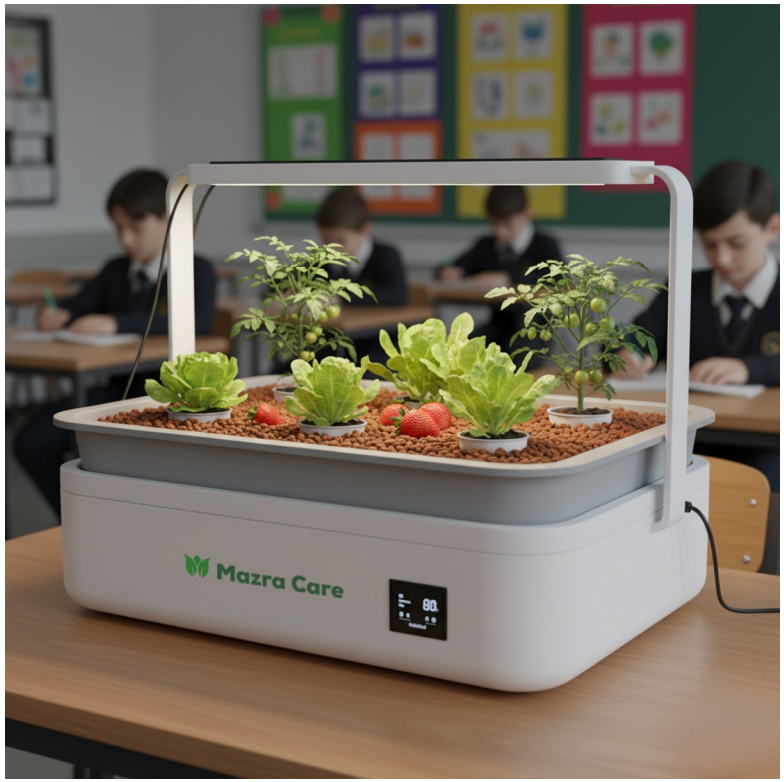
FEATURES	SPECIFICATION
Name	
Size	30cm Radius x 45cm Height
Capacity	6–12 plants
Lighting	Full-spectrum LED grow light
Material	Food-grade ABS plastic
Power	12V plug-in safe adapter
Water Cycle	Automatic circulation (quiet pump)

GROUP 1: KG – GRADE 3



FEATURES	SPECIFICATION
Name	
Size	35cm Radius x 45cm Height
Capacity	8–18 plants
Lighting	Full-spectrum LED grow light
Material	Food-grade ABS plastic
Power	12V plug-in safe adapter
Water Cycle	Automatic circulation (quiet pump)

GROUP 1: KG – GRADE 3



FEATURES	SPECIFICATION
Name	
Size	40cm x 20cm x 45cm
Capacity	6–12 plants
Lighting	Full-spectrum LED grow light
Material	Food-grade ABS plastic
Power	12V plug-in safe adapter
Water Cycle	Automatic circulation (quiet pump)

Educational Kit Includes:

- Illustrated Student Activity Booklet
- Teacher's Guide
- Seed Pack (2 cycles)
- Nutrient Solution Pack (2 months)
- Maintenance Toolkit

GROUP 2: GRADE 4 – 6

“Junior Agronomist” – Observation & Recording

Concept:

Students in this age group explore **data-driven observation**. The system encourages note-taking, comparing growth patterns, and recording changes under different conditions.

Learning Outcomes:

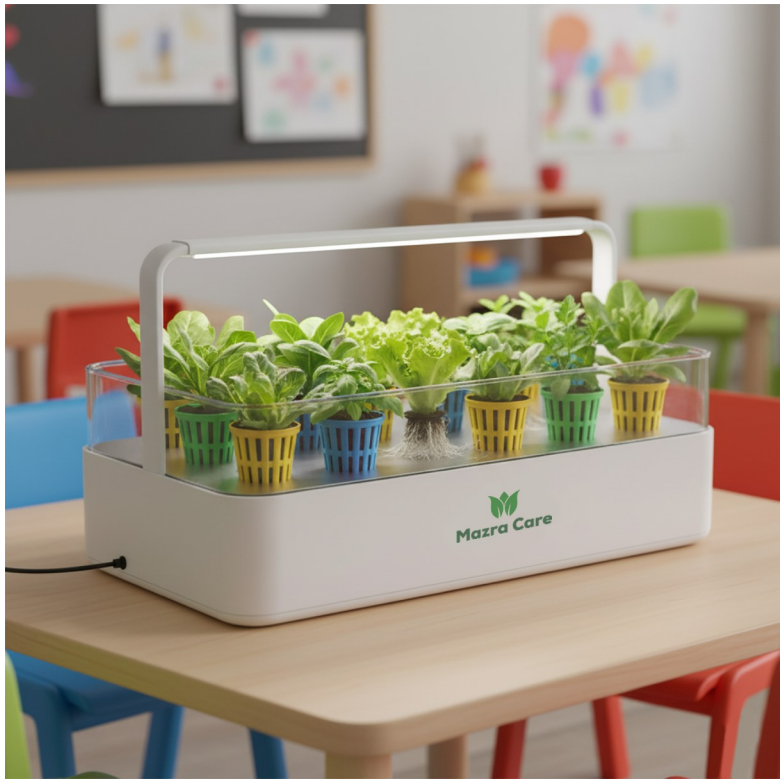
Introduction to nutrients, water balance, and pH
Encourages observation, critical thinking, and group collaboration
Builds scientific curiosity and recording habits

GROUP 2: GRADE 4 – 6

System Features:
Mid-size structure suitable for classroom/lab use
Real-time digital display of water temperature, pH & EC
Easy refill ports for water and nutrients
Transparent grow pods for visibility
Soil-free clean operation — ideal for indoor classrooms

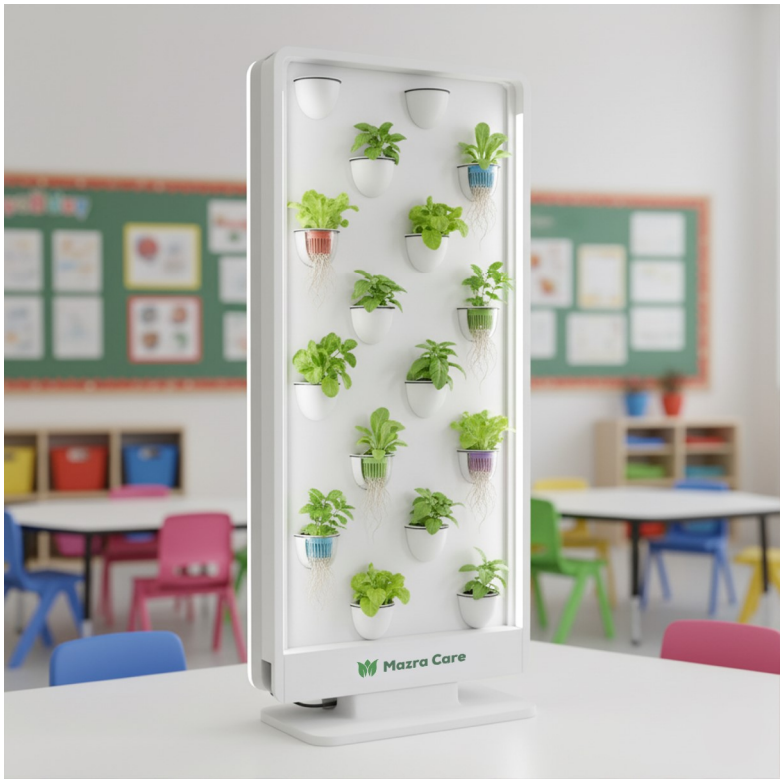
Crops Included:
Strawberries
Cherry Tomatoes

GROUP 2: GRADE 4 – 6



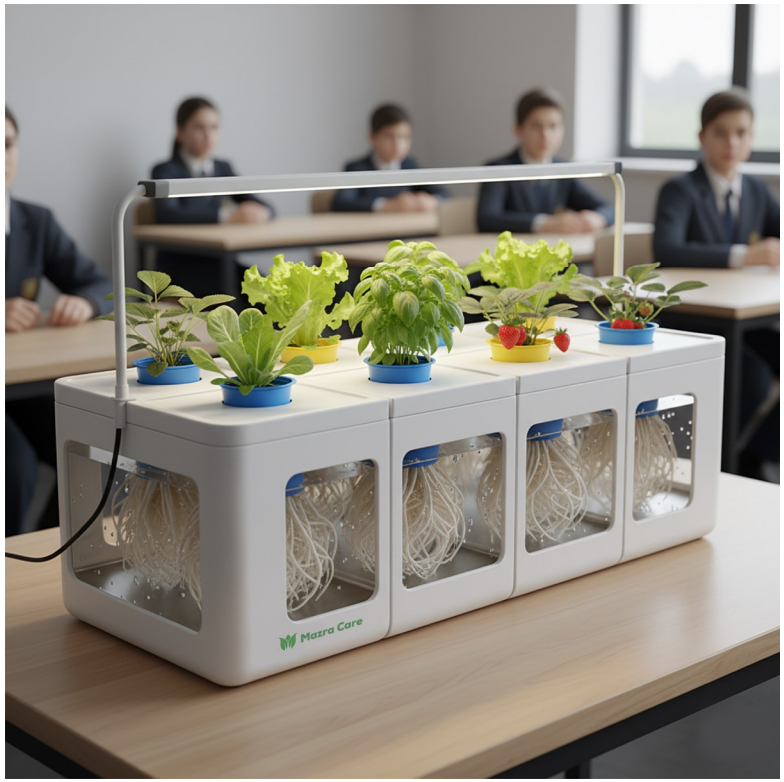
FEATURES	SPECIFICATION
Name	
Size	50cm x 30cm x 40cm
Capacity	12–24 plants
Frame	Anodized aluminum with clear acrylic cover
Sensors	pH, EC, temperature monitor
Lighting	Dual grow-light bar (energy efficient)
Control	Semi-automated circulation system

GROUP 2: GRADE 4 – 6



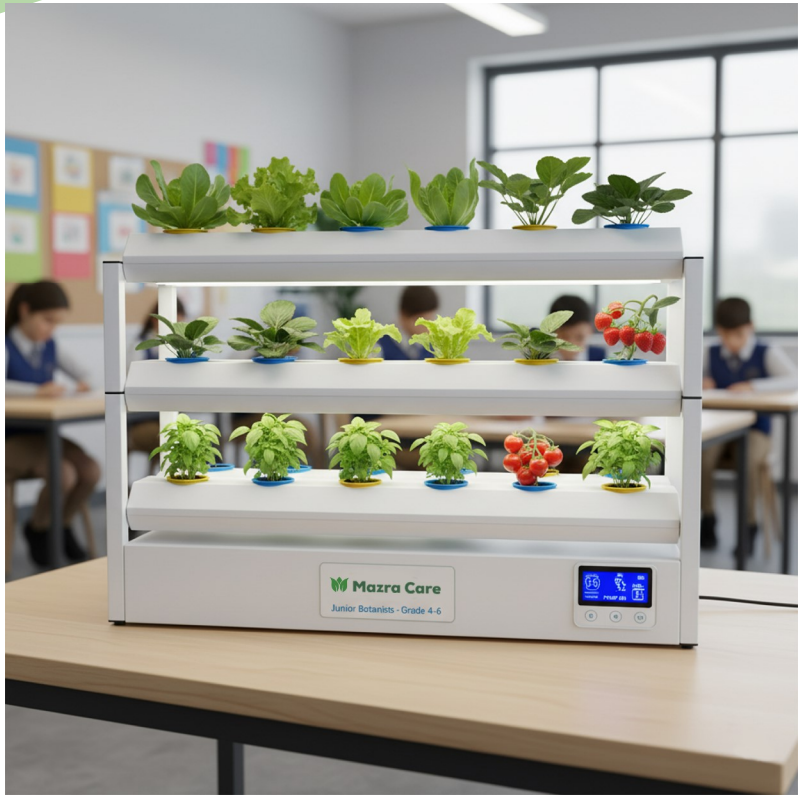
FEATURES	SPECIFICATION
Name	
Size	40cm x 15cm x 90cm
Capacity	30–50 plants
Frame	Anodized aluminum with clear acrylic cover
Sensors	pH, EC, temperature monitor
Lighting	Dual grow-light bar (energy efficient)
Control	Semi-automated circulation system

GROUP 2: GRADE 4 – 6



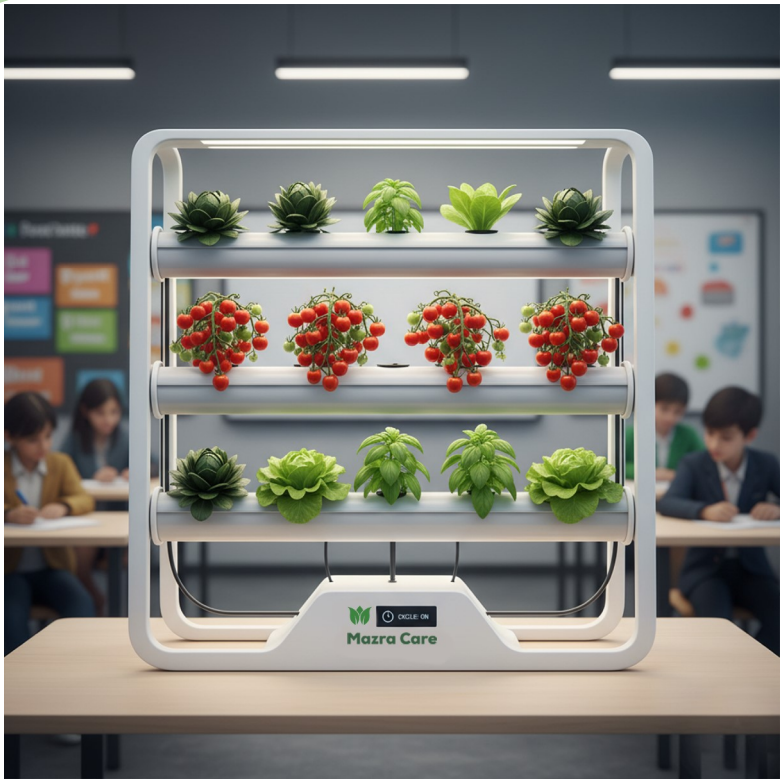
FEATURES	SPECIFICATION
Name	
Size	80cm x 30cm x 60cm
Capacity	8–32 plants
Frame	Anodized aluminum with clear acrylic cover
Sensors	pH, EC, temperature monitor
Lighting	Dual grow-light bar (energy efficient)
Control	Semi-automated circulation system

GROUP 2: GRADE 4 – 6



FEATURES	SPECIFICATION
Name	
Size	70cm x 20cm x 70cm
Capacity	18–42 plants
Frame	Anodized aluminum with clear acrylic cover
Sensors	pH, EC, temperature monitor
Lighting	Dual grow-light bar (energy efficient)
Control	Semi-automated circulation system

GROUP 2: GRADE 4 – 6



FEATURES	SPECIFICATION
Name	
Size	60cm x 20cm x 60cm
Capacity	20–50 plants
Frame	Anodized aluminum with clear acrylic cover
Sensors	pH, EC, temperature monitor
Lighting	Dual grow-light bar (energy efficient)
Control	Semi-automated circulation system

Educational Kit Includes:

- Growth tracking charts
- Digital pH/EC tester
- Observation diary template
- Fruit-bearing plant starter kit
- Annual refill nutrient & seed plan

GROUP 3: GRADE 7 – 9

“Future Scientist” – Nutrient Science & System Design

Concept:

At this level, students become experimenters — learning how **nutrients, light, and water flow** affect plant growth. The system allows for small-scale research projects and system design challenges.

Learning Outcomes:

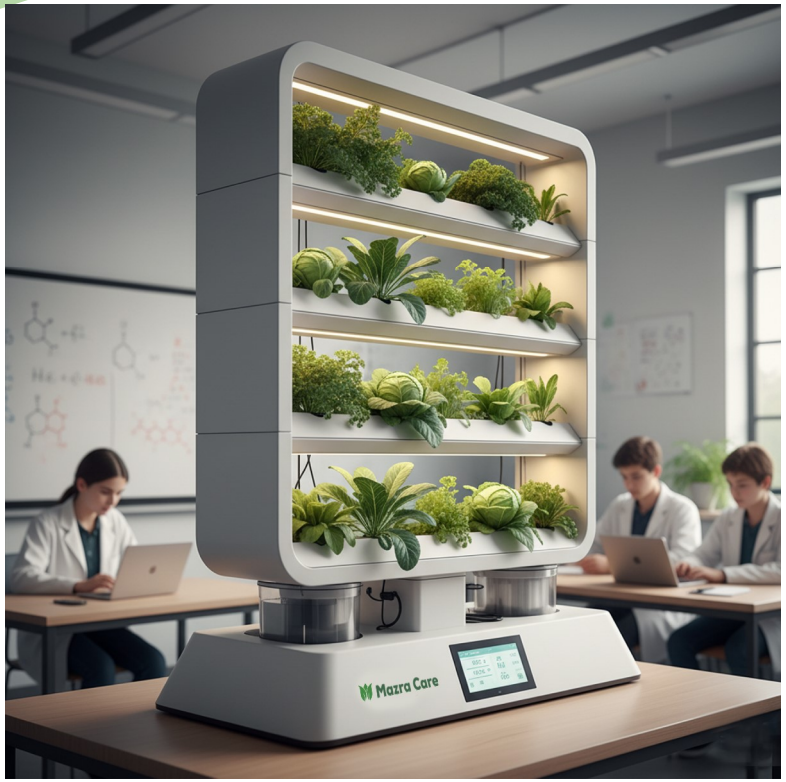
STEM integration (Physics of light, Chemistry of nutrients, Biology of growth)
Experimentation with variables (pH, nutrient ratios, water flow)
Problem-solving and teamwork
Understanding sustainable urban farming technologies

GROUP 3: GRADE 7 – 9

System Features:
Multi-tier vertical hydroponic tower (3 to 5 levels)
Digital nutrient dosing unit
Recycled water circulation
IoT-ready module for data monitoring (optional)
Adjustable LED bars and misting options

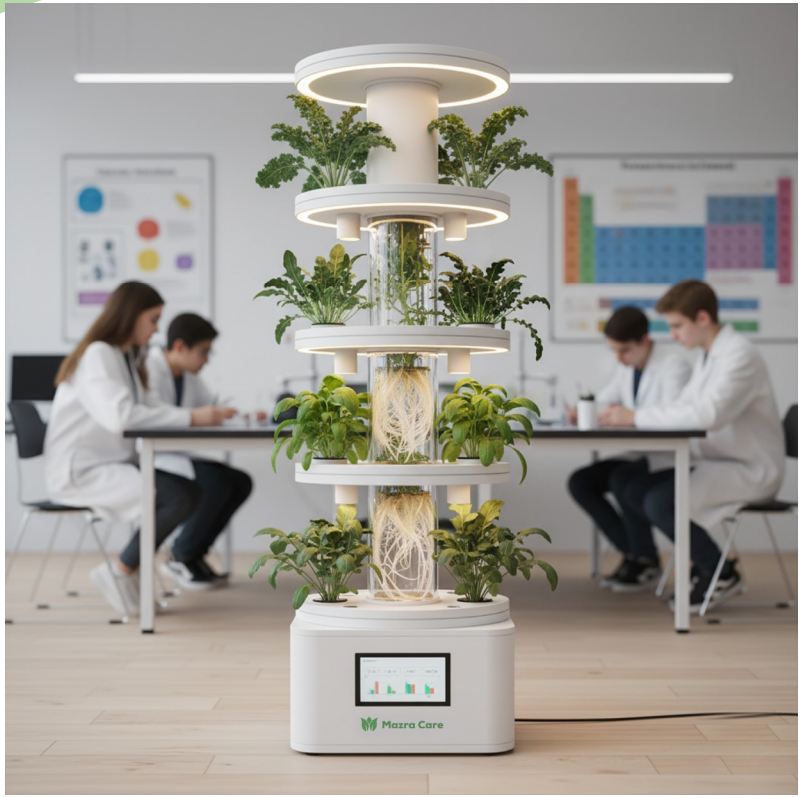
Crops Included:
Kale
Arugula
Herbs (Coriander, Thyme, Oregano)

GROUP 3: GRADE 7 – 9



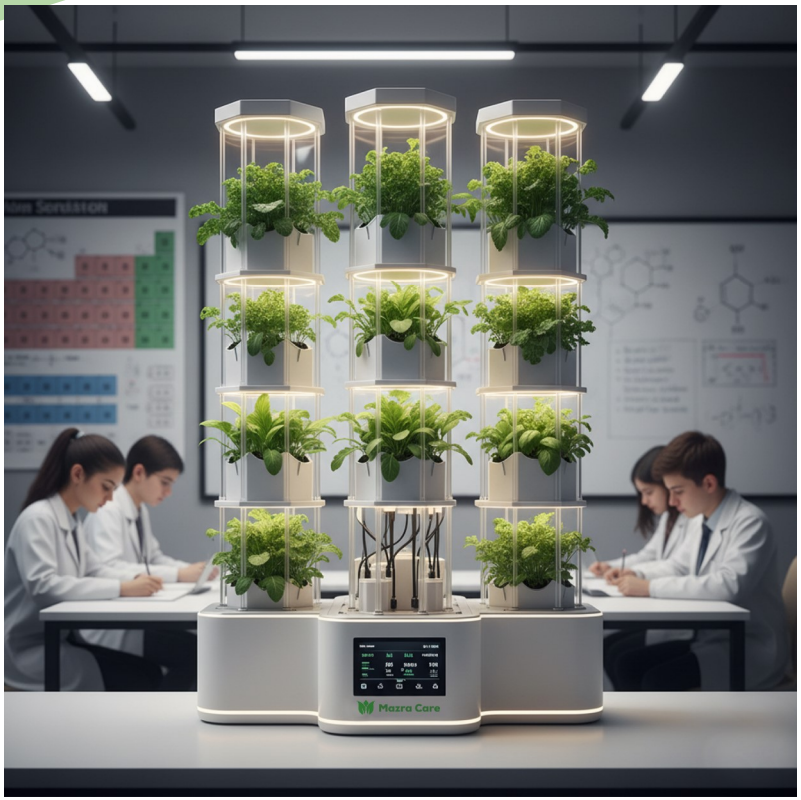
FEATURE	SPECIFICATION
Name	
Size	80cm x 20cm x 80cm
Capacity	30–60 plants
Power	24V smart controller system
Frame	Stainless steel base with PVC grow channels
Automation	Timer-based nutrient dosing & light cycle
Water Use	90% less than traditional farming

GROUP 3: GRADE 7 – 9



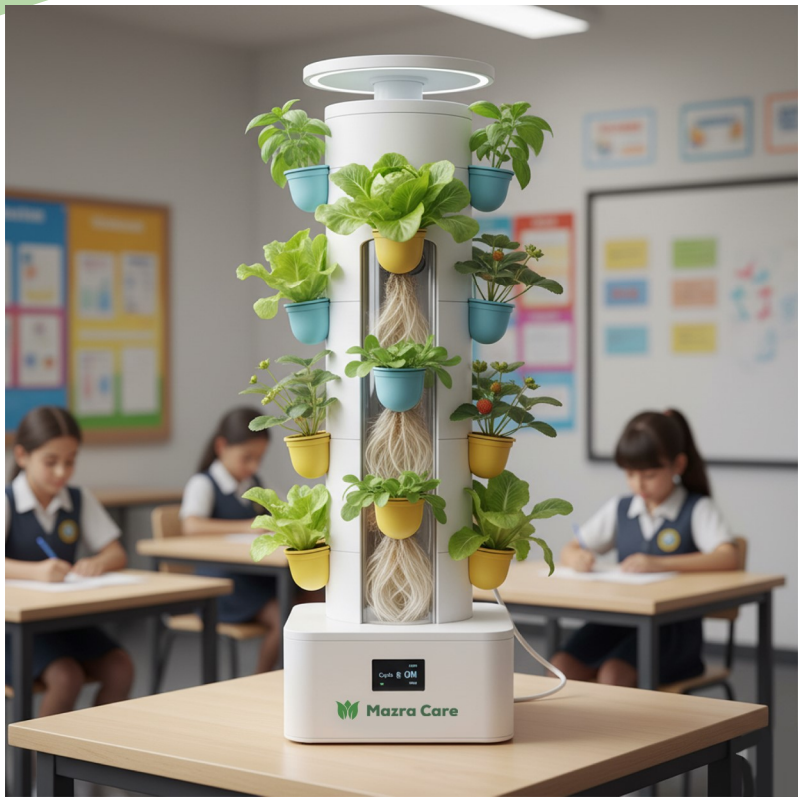
FEATURE	SPECIFICATION
Name	
Size	35cm x 35cm x 100cm
Capacity	24–54 plants
Power	24V smart controller system
Frame	Stainless steel base with PVC grow channels
Automation	Timer-based nutrient dosing & light cycle
Water Use	90% less than traditional farming

GROUP 3: GRADE 7 – 9



FEATURE	SPECIFICATION
Name	
Size	70cm x 40cm x 100cm
Capacity	40–80 plants
Power	24V smart controller system
Frame	Stainless steel base with PVC grow channels
Automation	Timer-based nutrient dosing & light cycle
Water Use	90% less than traditional farming

GROUP 3: GRADE 7 – 9



FEATURE	SPECIFICATION
Name	
Size	30cm x 30cm x 90cm
Capacity	30–54 plants
Power	24V smart controller system
Frame	Stainless steel base with PVC grow channels
Automation	Timer-based nutrient dosing & light cycle
Water Use	90% less than traditional farming

Educational Kit Includes:

- Student Lab Manual
- Hydroponic Nutrient Set (A+B formulation)
- IoT Monitoring App (optional)
- Safety & Maintenance guide
- Certificate: “Future Scientist – Level 3”

GROUP 4: GRADE 10 – 12

“Young Entrepreneur” – Yield, Business & R&D

Concept:

Senior students take the role of **young entrepreneurs and researchers**, managing yield, cost, and sustainability. This stage introduces **smart farming, business analysis, and marketing**.

Learning Outcomes:

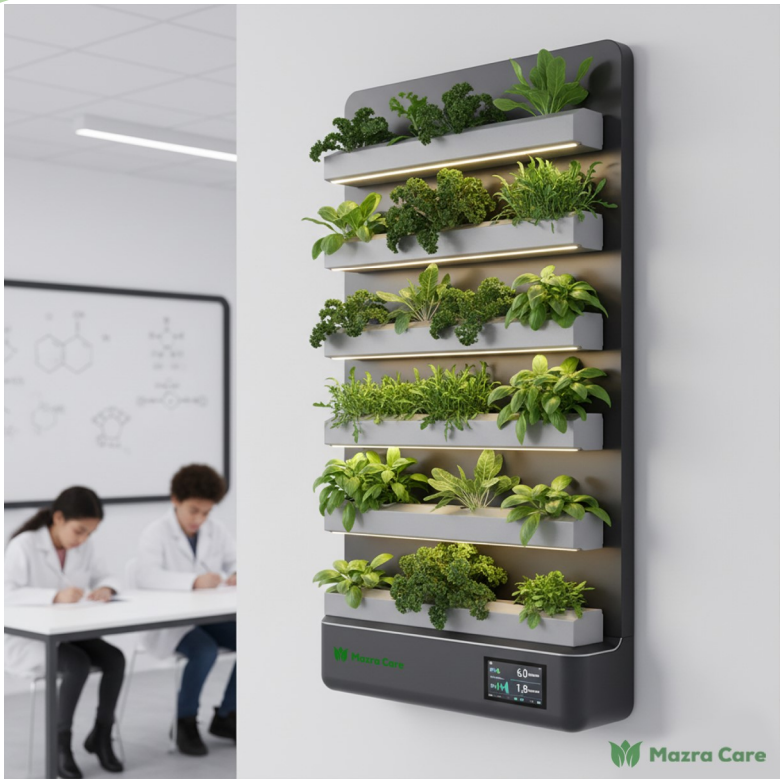
Understanding hydroponic economics (cost vs yield)
Developing business plans for sustainable farming
Conducting research on crop optimization
Learning marketing, packaging, and entrepreneurship

GROUP 4: GRADE 10 – 12

System Features:
Hybrid design (NFT + Deep Water Culture system)
IoT-based monitoring (App-enabled nutrient & water control)
Expandable design for group research projects
Modular sections for R&D or school entrepreneurship labs

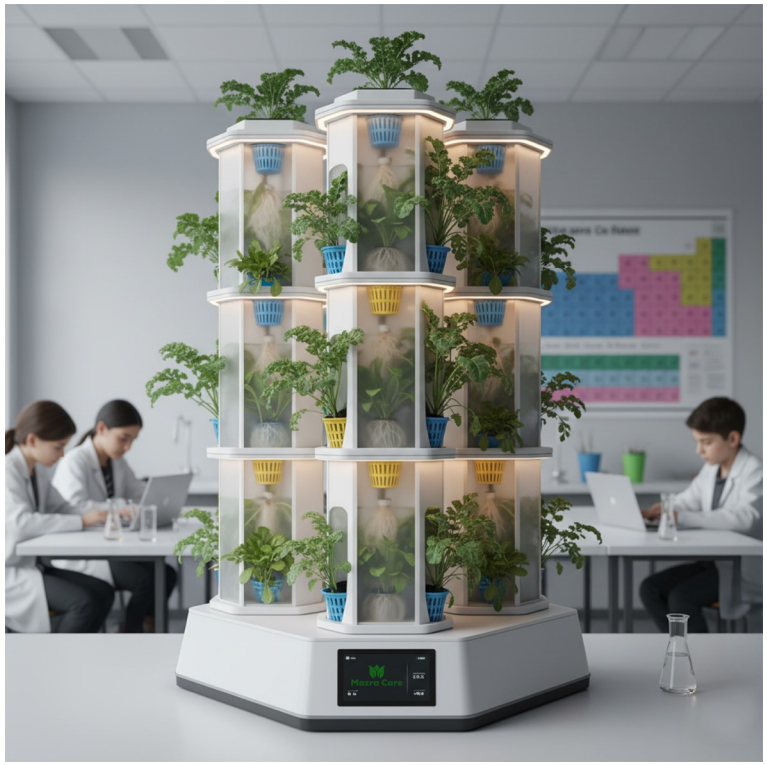
Crops Included:
Bell Peppers
Baby Cucumbers

GROUP 4: GRADE 10 – 12



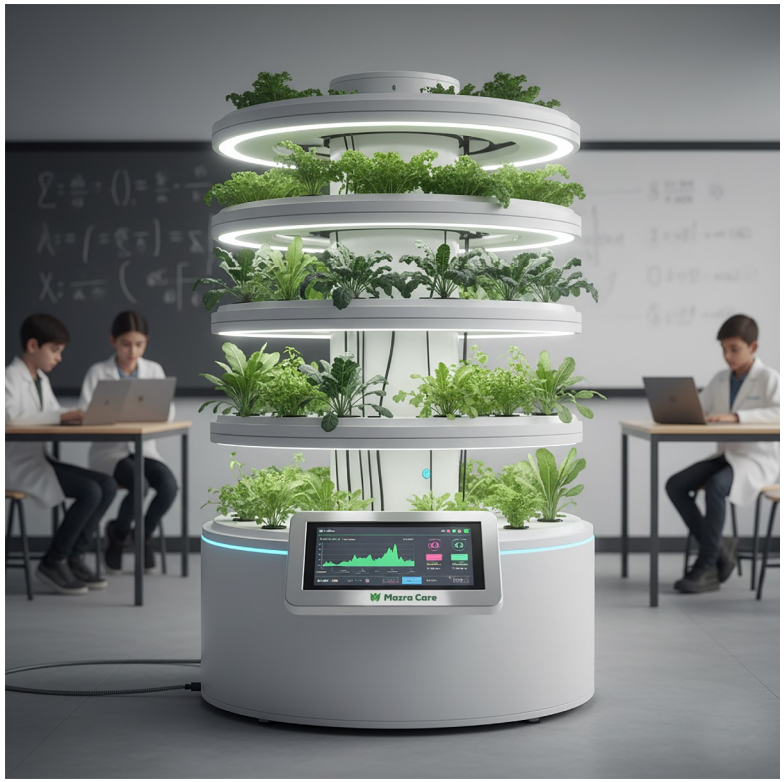
FEATURE	SPECIFICATION
Name	
Size	90cm x 15cm x 120cm
Capacity	36–72 plants
System Type	Modular NFT + DWC hybrid
Automation	Full control (IoT-enabled)
Connectivity	Wi-Fi / App dashboard
Yield Cycle	25–35 days (leafy) / 45–60 days (fruiting)
Water Use	90% less than traditional farming

GROUP 4: GRADE 10 – 12

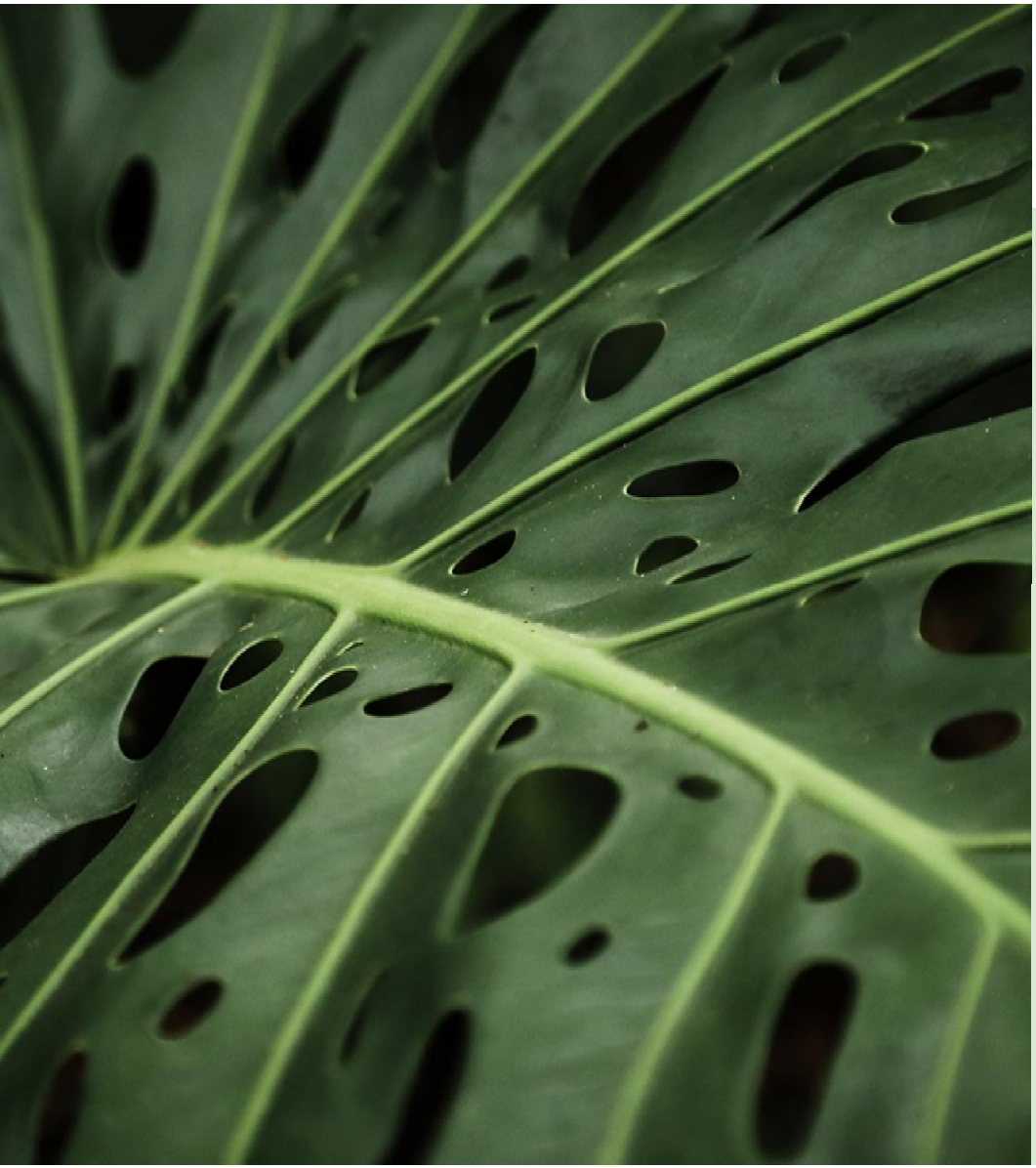


FEATURE	SPECIFICATION
Name	
Size	60cm x 60cm x 100cm
Capacity	40–80 plants
System Type	Modular NFT + DWC hybrid
Automation	Full control (IoT-enabled)
Connectivity	Wi-Fi / App dashboard
Yield Cycle	25–35 days (leafy) / 45–60 days (fruiting)
Water Use	90% less than traditional farming

GROUP 4: GRADE 10 – 12



FEATURE	SPECIFICATION
Name	
Size	45cm Radius x 180cm Height
Capacity	50–100 plants
System Type	Modular NFT + DWC hybrid
Automation	Full control (IoT-enabled)
Connectivity	Wi-Fi / App dashboard
Yield Cycle	25–35 days (leafy) / 45–60 days (fruiting)
Feature	Specification



Student Benefits

- Practical learning in biology, chemistry, and environmental science.
- Encourages healthy eating and entrepreneurial thinking.
- Optional program: eat the harvest or sell back to the company.

Partnership with School

- On-campus demonstration model.
- Monthly workshops.
- Annual agriculture fair.

YIELD ESTIMATES

Average yield per student per month

- 2–5 kg of vegetables.

Annual Yield

•240,000–480,000 kg.

If bought back by company

•Resale potential through vending machines or partner outlets.

INTEGRATION POSSIBILITIES

INTEGRATION AREA	DESCRIPTION	INTEGRATION AREA
STEM CURRICULUM	Science (growth), Technology (automation), Engineering (design), Math (data analysis)	**STEM Curriculum**
EXTRACURRICULAR CLUBS	“Eco Club” / “Green Lab” setup within schools	**Extracurricular Clubs**
SCHOOL LABS	Permanent hydroponic corners for biology, chemistry, or sustainability labs	**School Labs**
ANNUAL COMPETITIONS	Mazra Care “Green Innovation Challenge” between schools	**Annual Competitions**
TEACHER TRAINING	Certified training on hydroponic education and classroom management	**Teacher Training**

Maintenance & Safety

- Annual Maintenance Contract (AMC) optional
- All systems are child-safe and CE-certified
- Uses non-toxic, food-grade materials
- Operates with low voltage power (12V/24V)
- 90% water saving, soil-free, and zero pesticide use

Thanks