



HYDROPONICS

Past, Present and Future

What is Hydroponics?

- Hydroponics is the process of growing plants in **sand, gravel or running water**
- There is no **soil** used in hydroponics systems
- **Nutrients** are added to the water to replace what plants normally get from soil
- There are many different types of Hydroponics systems
 - We have **five different types** of hydroponics systems in the school
 - These five types make up our **seven** different hydroponic **stations**

Vertical Garden



- Can have up to 39 different plants
- Nutrient water is pumped from the base of the tower and drains down through each section.

Nutrient Film

- Can have up to **24** different plants
- Nutrient water is pumped from a **reservoir** near the bottom and flows through the pipes
- Flow of the water is controlled by a **restrictor** at each bend of the pipes



Flood Table



- Also called a **deep water culture** or an “**Ebb and Flow**”
- Nutrient water is pumped from a reservoir **under** the flood table
- The pump only runs for a **short time** each day to maintain the water **level** on the table

Airponics

- Nutrient water is pumped to **misters** located near the **roots** of the plants
- The **excess** water drains back into the reservoir



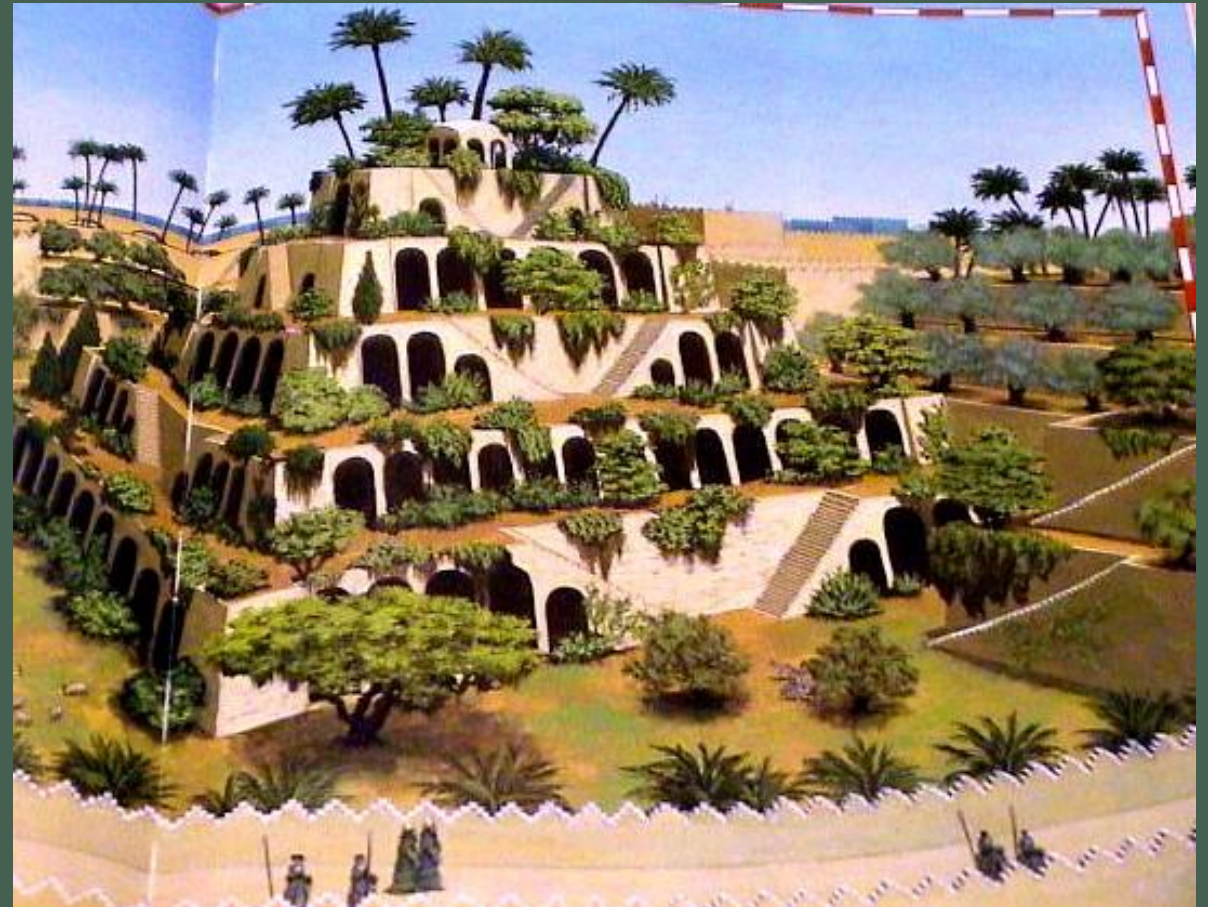
Aquaponics



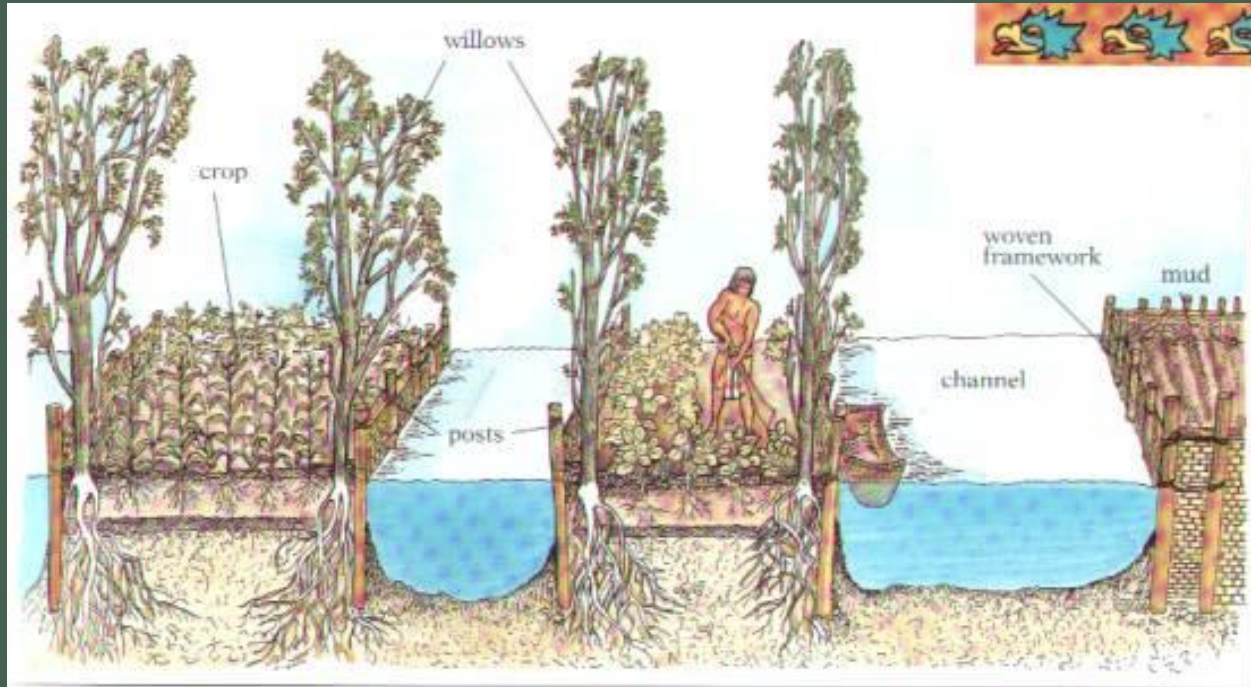
- This is the only system that we **do not** use nutrient water in.
- Nutrients are introduced to the plants by the **fish**, located underneath the flood table.
- Water is **pumped** from the fish tank to the plants and **drains** back into the tank.

The History of Hydroponics

- The Hanging Garden of Babylon are believed to be the **first successful** hydroponic garden
- The Hanging Gardens were built in approximately **600 BCE**
- They are considered to be one of the seven **wonders of the ancient world**



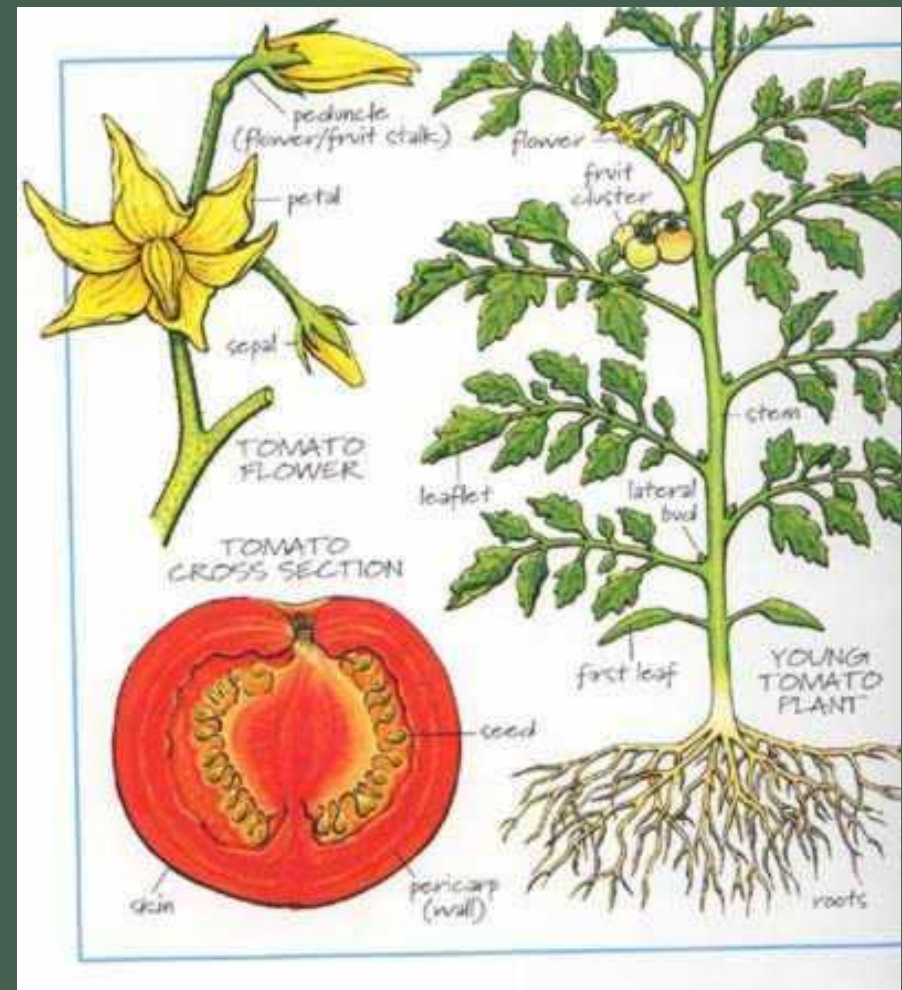
The Floating Gardens of the Aztecs



- The Aztecs of Central America practiced hydroponics out of **necessity**
- They built **rafts** out of rushes and reeds, then piled soil on these rafts
- Some of the rafts were as long as **200 feet**
- This occurred in the **11th Century**

Dr William F Gericke

- In the late 1920s/early 1930s, Dr Gericke focused on growing **practical** crops for large scale commercial purposes
- He is the first to suggest the term hydroponics.
- He combined two Greek words
 - **Hydro** meaning water
 - **Ponics** meaning labour



World War II



- During WWII, **growing** food in Europe or **shipping** fresh food across the Atlantic was nearly **impossible**
- In 1945, the USAF built a hydroponic farm in the **South Atlantic**
- These hydroponic farms provided **vegetables** for the U.S. troops

Mainstream 1970s-80s

- The introduction of **PVC pipe** in the late 1970s made hydroponic systems **convenient and easier to operate**



Hydroponic tomato grower, Jack Benjamin, tends to his crop in his Washington state greenhouse.

Hydroponics and Submarines



- Currently, the USA has hydroponic farms that cover as many **60 acres**.
- The US Navy is growing fresh vegetables on **submarines** in specialized hydroponics systems to supply fresh vegetable for the crews

The Future of Hydroponics

- Currently, plans are being drawn for using hydroponics on **space stations** and on the surfaces of other **celestial bodies**
- Hydroponics will be used in areas such as **deserts and mountains**, where it is difficult to grow plants using traditional methods

