

**INTENSE FARMING
AND VERTICAL
FARMING**

LEARNING OUTCOMES

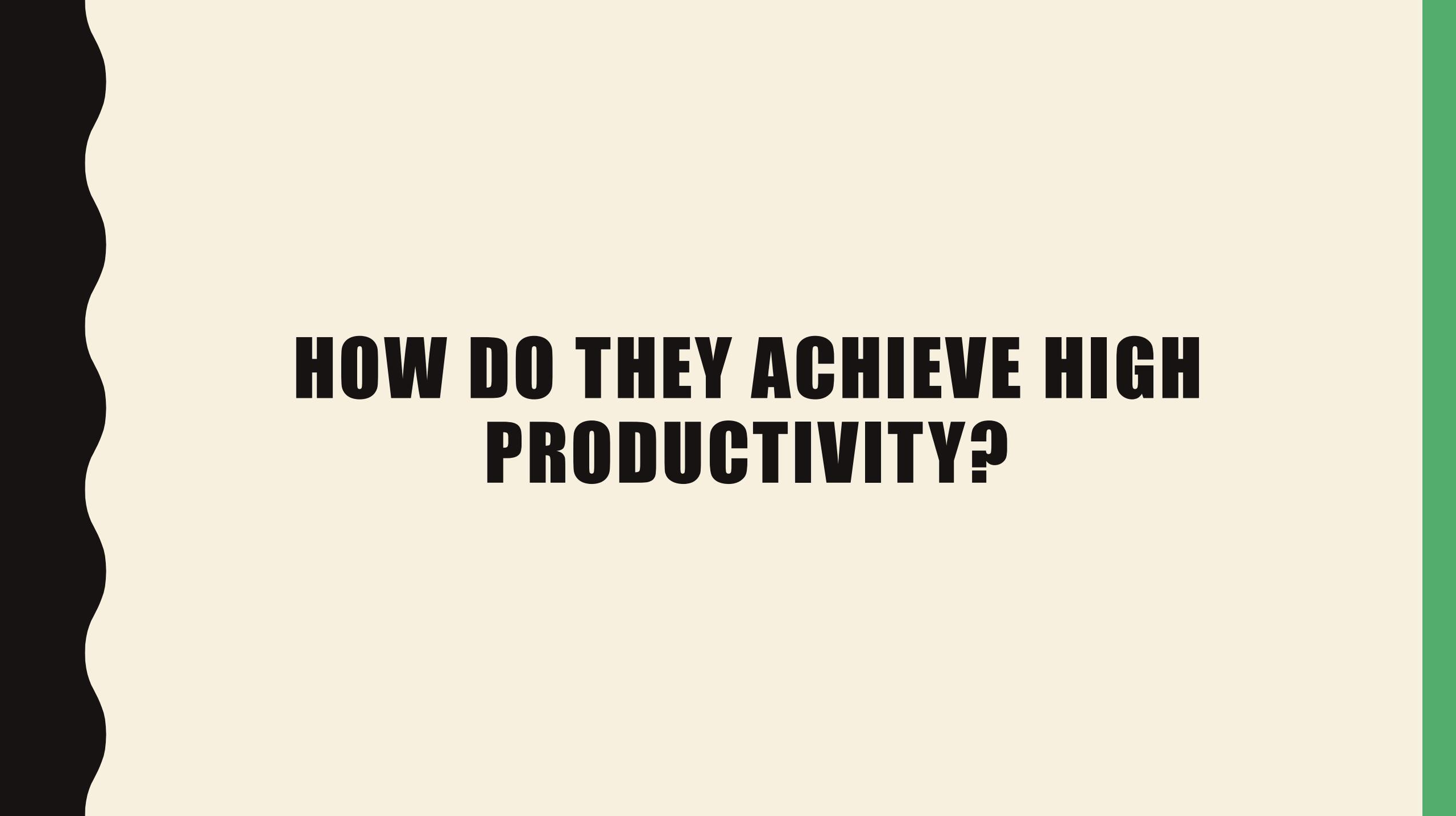
- Know what intense farming is
- Know the key components to advanced farming to make it more productive
- Pros and Cons of intensive farming (traditional)
- Know what vertical farms are and the basics on how they function
- Take note of the current vertical farm systems in urban environments
- Pros and Cons of vertical farms
- Try to get students into a discussion in which type (intense vs vertical) is better

WHAT IS INTENSE FARMING?

Intensive farming or **intensive agriculture** involves various types of agriculture with higher levels of input and output per cubic unit of agricultural land area. It is characterized by a low fallow ratio, higher use of inputs such as capital and labor, and higher crop yields per cubic unit land area. This contrasts with traditional agriculture, in which the inputs per unit land are lower.



Intensive farming seen through satellite imagery.



**HOW DO THEY ACHIEVE HIGH
PRODUCTIVITY?**

KEY COMPONENTS TO INTENSIVE FARMING

Seeds

Creation of varieties that produce high yields or strong disease resistance or early harvests

Crop Rotation

Introduction of planned crop rotations as to ensure good soil health thus not compromising future produce and keeping high yields.

Irrigation

Innovations creating better irrigation systems to accommodate larger farms and also to ensure all crops are getting enough moisture which is proven to be a key component to high yields for crops.

Weed Control

Better weed control have made it easier for farmers on a **large scale** to control unwanted growths and also improved herbicides to control them as well.

Fertilizers

Introduction of synthetic fertilizers instead of processed animal manure has made it possible for fertilizer application on a much larger scale thus intensifying farming practices.

PROS AND CONS OF INTENSIVE FARMING

Advantage	Disadvantage
Produces high amounts of food / product	Still uses a large amount of land
From intensive farming costs of crops and animal products have become cheaper thus making it more universally available	Usually unsustainable in terms of land use
More efficient in amount of product to amount of land used compared to traditional farming methods	Intensive farming involves the use of various kinds of chemical fertilizers, pesticides, and insecticides.
Makes aiming food security more realistic	Affects and alters the environment in multiple ways. Forests are destroyed to create large open fields, and this could lead to soil erosion
	Pesticides sprayed on crops not only destroy pests and contaminate the crops, but also kill beneficial insects
	Fruits and vegetables purchased from farms that promote intensive farming are covered with invisible pesticides
	There are many hybrid varieties of livestock, plants, and poultry available today. The livestock and poultry are injected with hormones and other chemicals to increase the yield.

WHAT IS VERTICAL FARMING

Vertical farming is the practice of producing food and medicine in vertically stacked layers, vertically inclined surfaces and/or integrated in other structures (such as in a skyscraper, used warehouse, or shipping container)

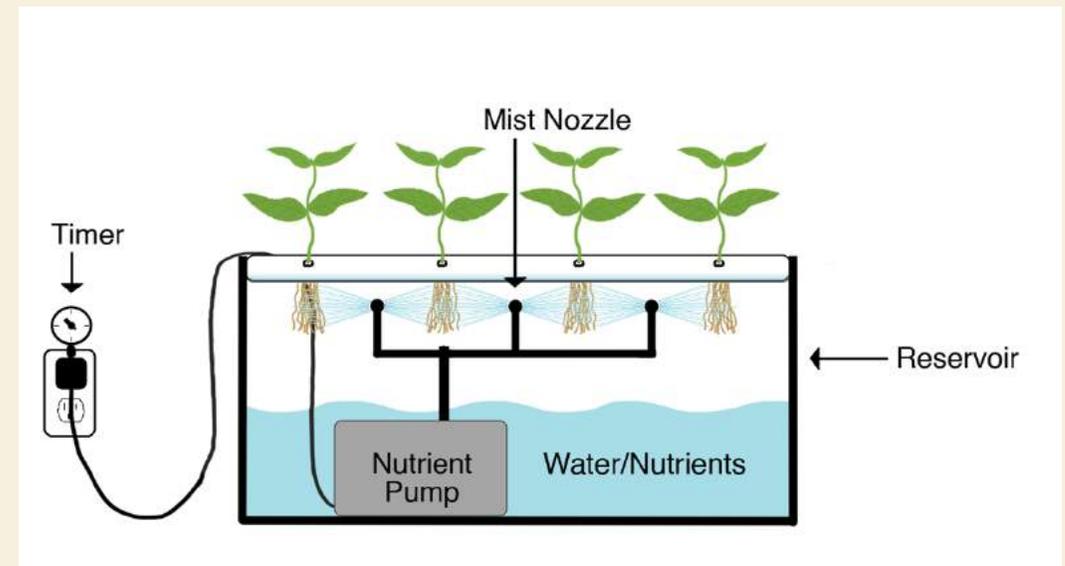
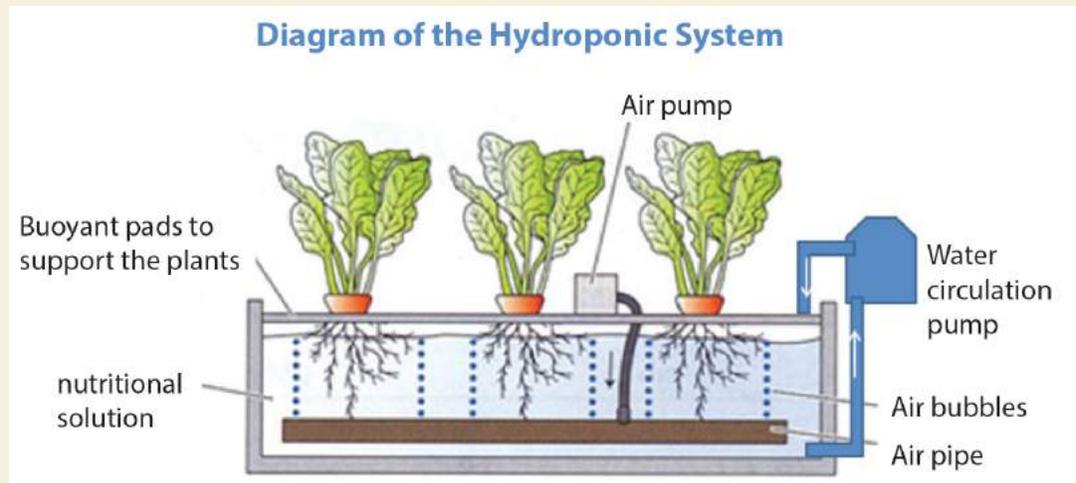
On the left there is the stacked layers method whereas on the right is the vertical method where vegetation can grow on either vertically upright pillars or on walls.



HOW THEY WORK

Vertical farm systems utilize no soil. This works as they use a hydroponic or aquaponic system where the roots are soaked in the water and the water itself has dissolved fertilizer so the nutrients usually taken from the soil is already in the water.

There is also aeroponics where in essence similar to hydroponics but instead it utilizes a mist with the necessary nutrients.



CURRENT VERTICAL FARM SYSTEMS

Aerofarms - A New York agriculture company that is utilizing aeroponics growing leafy greens and herbs. It is a successful company selling pesticide free produce in an urban environment that pulls customers by it being a local product and safe to eat due to its pesticide free nature.



CURRENT VERTICAL FARM SYSTEMS

Bowery - An agriculture company based in New Jersey that utilizes a hydroponic system to grow green leaf vegetables and herbs. Similar to Aerofarms it is pesticide free and highly productive per hectare.



PROS AND CONS

Advantage	Disadvantage
Produces the highest crop yield relative to land use.	Very expensive to start up
Can be done in urban setting as its indoors.	Not all crops are viable with vertical farming
No pests / diseases due to no soil	Large electricity costs relative to amount of crops grown. (LED lights)
Makes local produce possible in an urban setting, creates communities for local fresh produce.	Does not produce as much as large traditional farms.
Does not contribute to soil erosion.	Pesticides sprayed on crops not only destroy pests and contaminate the crops, but also kill beneficial insects
Can be sustainable but dependent on economical sustainability.	

**SO WHICH ONE IS BETTER?
DISCUSS...**