

Vertical harvesting



Years 5-6
Years 7-8



Groups of 2



30 minutes



Pens/paper
A4 graph paper
3 coloured pencils
Timer

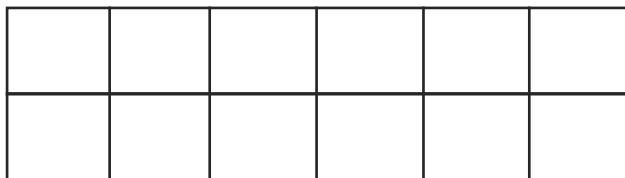
Student instructions

Write a planting schedule for a mechanical garden bed in a robotic garden to try and grow the highest yield of produce in 1 day (24 hours).

C Carrots (40kg per square) 4 hours to grow

T Tomato (20kg per square) 2 hours to grow

L Lettuce (5kg per square) 1 hour to grow



There are only 12 spaces to plant

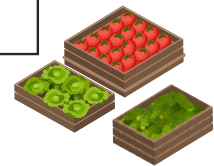


Growth can only occur when plants are under the light

Plants move one square every hour

Crops can only be planted in the bottom left square and replanted after they are harvested

Crops can only be harvested when plants are fully grown and reach the bottom right square



1. Draw a rectangle containing two columns of six squares on your graph paper
2. In each square write the letter that represents the crop you will grow in that space
3. Calculate the time it takes for one full rotation of the garden (plants are planted in the bottom left and move one square clockwise every hour)
4. Calculate the number of rotations to fully grow and harvest a crop (plants can only grow in the top two squares and be harvested in the bottom right square)
5. Count the number of kilograms of each crop after one day (24 hours)
6. Change your planting schedule to try and improve the yield of your crop

Which crop type produces the highest yield in one day (24 hours)?

Would this be different over one week?

How could you change this machine to optimise the yield for carrots?



Vertical harvesting: extension

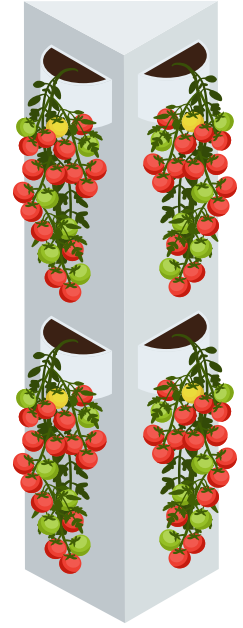
www.verticalharvestjackson.com

To feed everyone on the planet we will need to produce 70% more food by 2050. Farming in unconventional spaces will need to increase to keep up with this demand.

Vertical farms such as this one are designed to increase crop yield by rotating crops on vertical conveyors to provide access to light 24 hours a day.

This particular vertical farm has three different microclimates at different heights in the building. This allows them to grow many different types of crops that would never normally grow in the conditions in Wyoming, USA.

When Sam Bartels was 16-years old, she decided she wanted to have a lasting, positive impact on the agricultural landscape. She quickly became interested in vertical farming and when she couldn't find anything in Australia, started looking abroad. Vertical Harvest is a community impact driven business – pairing innovation with employment opportunities. Now Sam is the Business Development Director at Vertical Harvest, you can read more about her role in the start-up here at www.digitalcareers.csiro.au/sambartels



More about digital agriculture

For more information and the latest news on digital agriculture, visit:

www.digitalcareers.csiro.au/links

Research your own climate

Can you design a robotic garden to increase yield where you live?

Use a design thinking process to create your own robotic garden solution.



EXAMINE



PLAN



PRODUCE



EVALUATE

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www.youngictexplorers.net.au