

Essential Questions: How much land is saved by farming vertically? What are the benefits of farming vertically?

Background information: What do you already know about this topic? Facts? Problems? Unknowns?

Prediction: How much space will 9 acres of traditional farmland take up as a vertical farm?

Modeling:

Instructions:

- 1) Find 9 sheets of paper. Each piece of paper will represent one acre of farmland, with a crop that is 1 meter tall.
- 2) Lay out all of these in a square.
- 3) Fold each sheet of paper in half twice and then stack each piece of paper on top of one another.
- 4) Calculate how much land this will take up and how tall your vertical farm would be in feet.

Design exercise: Imagine you are in charge of designing a vertical farm.

Variables (Using lettuce as an example):

Plant Density: 3-5 plants per sq ft. (too close=more pests + disease, less weight per head)

Shelf Spacing: 12"-20" (Too little, and plants might not get enough airflow, too much= less profit)

Cycle Time: 40-55 days (Too short could affect flavor, and size of head)

Assume higher density and lower shelf spacing means 80 gram head vs 120gram head at lower density..

What will be the stats for your vertical farm (choose from the ranges above)?

Plant Density	Shelf Spacing	Cycle Time	Estimated gram per head

Make a sketch of your vertical farm:

