



Name: _____

Class: _____ Date: _____

Our Mung-bean Experiment

An activity of "World's tallest indoor vertical farm opens in Singapore".

Read "World's tallest indoor vertical farm opens in Singapore (page 20, *What's Up* March 2026). The article explains how Greenphyto grows vegetables using carefully controlled conditions like light and water.

- To warm up, answer this question. What were the features of the Greenphyto indoor vertical farm? Tick all that apply.
 - It grows crops on stacked trays.
 - It controls light.
 - It controls water and nutrients.
 - It uses technology and data.
 - It aims to help crops grow quickly.
 - It aims to help crops be consistent.
 - It aims to reduce waste.
- Your group's challenge today is to examine the conditions for growing bean sprouts (taugeh) from mung beans. You will need:
 - Two cups of mung beans (green beans) for sprouting
 - Four small trays or shallow tray-like containers
 - Water
 - Two handkerchiefs or thick paper napkins
 - A strainer and a ruler or tape measure.
- Each of the Greenphyto features listed above can be considered a "variable" in an experiment. In your experiment, let's keep it simple by having only two variables:
 - 1st variable = amount of light (darker vs brighter) for ten days
 - 2nd variable = snugness (with blanket vs without blanket) for five days
- Prepare four trays following the setups below. Each setup is a different combination of the two variables.

Four trays with two variable combinations	
Setup A: Darker space & with blanket	Setup B: Brighter space & with blanket
Setup C: Darker space, no blanket	Setup D: Brighter space, no blanket

- Place (a) two trays in the brightest spot (b) two trays in the darkest spot in your classroom. This takes care of your experiment's first variable, the amount of light.
- Lay out a single layer of beans in each tray. Carefully pour the same amount of water into each tray until the beans are $\frac{3}{4}$ submerged.

- The second variable is snugness, defined as having (or not having) a “blanket”. The blanket here is a damp handkerchief or paper towel. Place a blanket gently over the beans for Setups A and B respectively.
5. As a group, make two predictions.
 - We predict that (*tick only one*) Setup A Setup B Setup C Setup D provides the best conditions for the beans to grow well.
 - We predict that (*tick only one*) Setup A Setup B Setup C Setup D provides the worst conditions for the beans to grow well.
 6. Every day, add just enough water into each tray to keep the beans $\frac{3}{4}$ submerged.
 7. On Day 5, remove A and B’s blankets so that all the bean sprouts can respond to the brightness of their spaces.
 8. The experiment ends on Day 10. For each setup, select 10 of the longest bean sprouts. Measure all stems and record their mean length for each setup below. Describe in words the leaves’ colours, stems’ strength, and root growth. Use these four indicators to describe bean-sprout growth in each setup.

Observations: 10 bean sprouts per tray	
Setup A (<i>Darker space & wet blanket</i>) Mean stem length: Leaf colour: Stem strength: Root growth: Overall:	Setup B (<i>Brighter space & wet blanket</i>) Mean stem length: Leaf colour: Stem strength: Root growth: Overall:
Setup C (<i>Darker space, no blanket</i>) Mean stem length: Leaf colour: Stem strength: Root growth: Overall:	Setup D (<i>Brighter space & no blanket</i>) Mean stem length: Leaf colour: Stem strength: Root growth: Overall:

9. To conclude, revisit your two predictions above. How accurate was each of them?
10. Present your results to the class and comment on how this activity helped you better understand experimenting with indoor gardening.