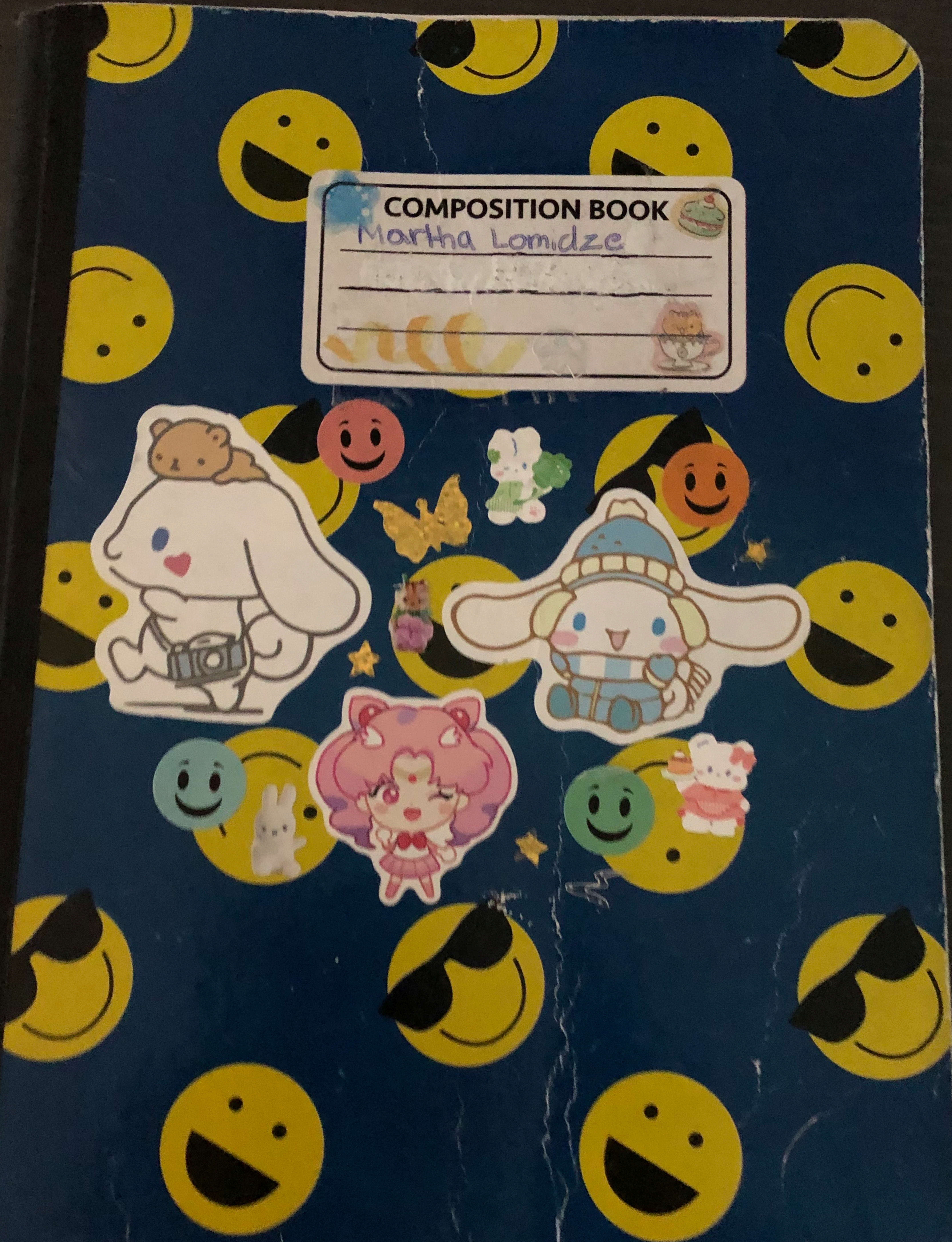
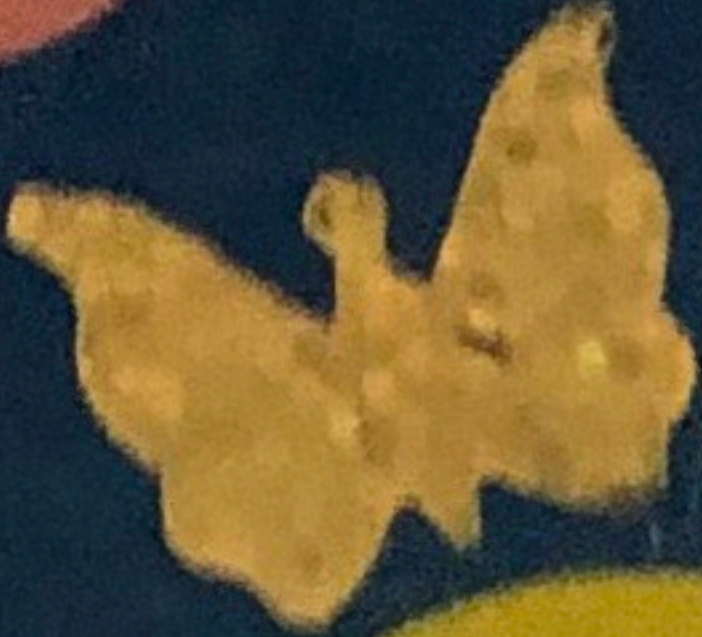
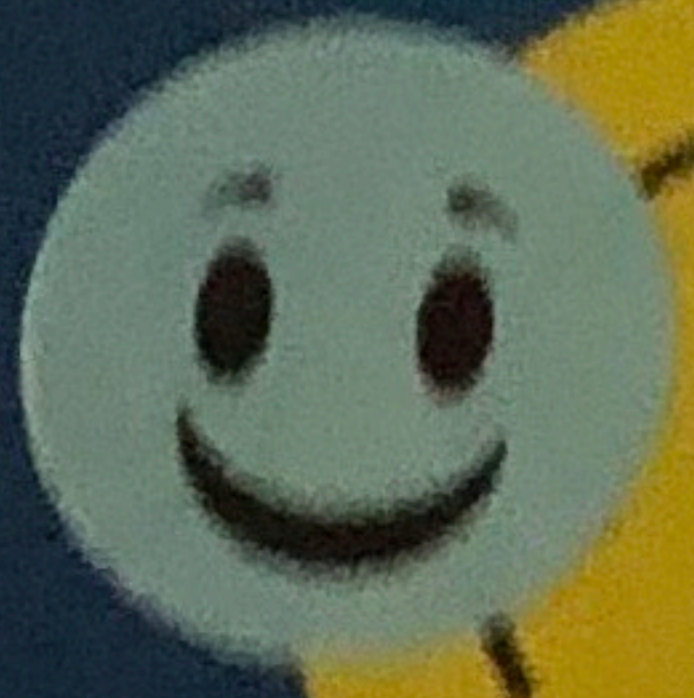


COMPOSITION BOOK
Martha Lomidze



Dec 8, 2025

Grade 5 Science fair

Title of Project
What liquid makes vegetables grow best?

Have all materials ready by Jan 5!
start as soon as possible

Items needed:

- 6 medium sized plastic cups (what you water plants with)
- potting soil
- 6 plastic water bottles (where water mixtures are made)
- 60 seeds of either plant
- Planting tray (small)
- water, milk, salt, vinegar, baking soda

Setup:

[wright on water bottles what solution it's using]

All mixed with 500 ml bottled water

- pure water
- milk = 125 ml (25% milk)
- sugary water = 20g (4% w/v)
- salty water = 2g (0.4% w/v)
- vinegar = 5% vinegar 15 ml (0.15% acetic)
- baking soda = 1.25g (0.25% w/v)

WATER EVERY 3-4 DAYS

Plan:

- tray should have 18 spots
- 5 seeds in each spot (3 seeds for pea)

Observation ideas:

- which germinates first
- how long/fast the plant needs to grow
- which has more leaves

Options for veggies:

- beans
- peas
- lettuce
- spinach
- radish

Question:

What vegetable grows best when watered with different types of liquids?

Hypothesis:

If I water different vegetables with various liquids, then I will be able to discover a solution that makes the vegetable grow faster and healthier. I expect the milky water will be the best because it can provide extra nutrients.

Jan. 3,
2026

Getting Materials

- went to Super Store and The Home Depot with dad
- got all materials needed for project!

Jan. 7,
2026

Planting Seeds

- planted all the seeds in the basement with dad
- made all the water mixtures (with help from dad and my sister!)

Jan. 9,
2026

Observations

- soil watered with sugar and milk was very dry and gray
- a fruit fly was flying around plants
- all of the plants soaked in liquid quite slowly
- water, baking soda, salt, and vinegar soils were moist and wet

Jan. 10

Germination!!!

EXTRA:

Soil was still very dry and gray (around the sides) for milk and sugar

- saplings emerged!!! - ^{First to germinate was} water radish
- which plant = Salt radish, B. Soda radish, Sugar radish, Milk radish, water radish, Vinegar lettuce, and B. Soda lettuce!
- (soil was slightly lifted up for Vinegar pea)
- Biggest plant was Water radish!

Jan 11

Growth & Germination =

- plants that were already germinated grew a LOT overnight
- the plants started smelling weird?
- Vinegar pea, water pea, water lettuce, milk lettuce, and salt lettuce germinated!
- Milk radish is yellow with orange and green leaf
- biggest plant is water Radish, about 3 inches tall

Jan 12

Observations #2 =

- water radish, B. Soda radish, and salt radish are very big and healthy, vinegar radish didn't grow, and sugar radish and

radish barely grew (they're very small)
- for water r, B. soda, and salt
radish all 5 out of 5 ^{seeds} grew
- all the sugar and milk soils had
trouble absorbing water

Jan. 5

Day 8

Since

veggies
were
planted)

Which plants grew & which didn't

LETTUCE:

vinegar lettuce: 1 out of 5 seeds grew and has 2 leaves
salt lettuce: 4 out of 5 seeds grew and has 8 leaves
b. soda lettuce: 5 out of 5 seeds grew and has 10 leaves
sugar lettuce: Didn't grow ñ
milk lettuce: 1 out of 5 seeds grew and only has 1 leaf
water lettuce: 1 out of 5 seeds grew and has 2 leaves

RADISH:

vinegar radish: Didn't grow ñ
salt radish: 5 out of 5 seeds grew, 10 leaves
b. soda radish: 5 out of 5 seeds grew, 10 leaves
sugar radish: 5 out of 5 seeds grew, 11 leaves? (Hard to tell)
milk radish: 4 out of 5 seeds grew, 8 leaves
water radish: 5 out of 5 seeds grew, 9 leaves

PEA:

vinegar pea: 3 out of 3 seeds grew, 13 leafs

salt pea: 2 out of 3 seeds grew, 5 leafs

b. soda pea: 1 out of 3 seeds grew, 1 leaf

sugar pea: Didn't grow "

milk pea: 3 out of 3 seeds grew, 8 leafs

water pea: 3 out of 3 seeds grew, 13 leafs

Jan. 18

(Day 11

since

veggies

were

planted)

Observations #3

PEA:

- water pea and vinegar pea are both really healthy and grew quite big

- milk pea is also healthy but one of the seedlings is small and growing somewhat slow

- Second seedling in b. soda pea germinated and 1st and 2nd seedlings are very small compared to other peas

- (b. soda makes peas grow slowly!)

RADISH:

- some leaves on the ^{water} radishes have black tips (NOT SOIL). Idk what it is it looks like it got burnt? (otherwise it's ^{pretty} healthy)
- stems on 2 of the seedlings of milk radish are turning slightly orange
- sugar r. is doing VERY bad ☹️ the seedlings are like 3 cm tall and they're withering and leaves are turning orange
- B.soda radish is very healthy and about same height as water radish (somewhere around 5 inches tall)
- salt radish is also healthy

LETTUCE:

- Frankly out of all the veggies lettuce is doing the worst ☹️
- milk and water lettuce still only have 1 seedling
- there's a weird ^{small} green fuzz

the
ball in the middle of sugar
radish soil? (probably mold!)

- b. soda lettuce is doing the best out of all the lettuces. It's healthy, has all 5 seeds grown, and was also the first lettuce to germinate!
- salt lettuce is also doing good. A bit taller than b. soda lettuce (about 3 inches)
- vinegar radish is... okay I guess? Only 1 seedling tho

Jan. 28

(Day 2)

Since

veggies

Leaf counting

LETTUCE:

were (Planted) Vinegar lettuce: Mostly withered but has 2 leafs
Salt lettuce: Also mostly withered but estimate is 8 leafs
Baking Soda lettuce: extremely withered (technically dead) but has maybe 5 leafs
Sugar lettuce: DIDN'T GROW
Milk lettuce: 2 leafs
Water lettuce: Most healthy! Second seedling germinated!!! 4 leafs

RADISH:

- Vinegar radish: DIDN'T GROW
- Salt radish: Hard to count! 8 leaves?
- B. Soda radish: 10 leaves
- Sugar radish: 8 leaves (only 1 seedling is ^{doing good?})
- Milk radish: 8 leaves
- Water: 11 leaves

PEA:

- Vinegar: Pretty sure that it has 40 leaves
- Salt: 25 leaves?
- Baking Soda: 13 leaves? (Btw ^{newly germinated seedling is starting to wither})
- Sugar: DIDN'T GROW
- Milk: Estimate is 45? (VERY hard to tell)
- Water: Pretty sure that it has 28-31 leaves