



Prize Winner

Scientific Inquiry

Year 3-4

Max Vella

**St Thomas Catholic School,
Goodwood**



Scientific Inquiry

Question:

Worm Tea – Do fruit or vegetables produce more growth in radishes?

Prediction:

I think that radishes watered with worm wee from the vegetable eating worm farm will grow better than the radishes watered from fruit eating worm farm and the radishes watered with just water.

Background:

Worm wee is a special juice made by worms. The worms eat food scraps, they poo and the water seeps through as worm wee. Worm wee has lots of vitamins and is good for plants. I got the idea because our school has a worm farm and sells worm wee to my Mum.

Purpose:

I am doing this experiment to test to see if worm wee helps to grow radishes?

Method:

- I set up 2 worm farms
- I fed 250g of fruit scraps and 250g of vegetable scraps to the worm farm each week
- After 4 weeks, I extracted 1L of worm wee from both worm farms
- We planted 6 radish seeds in small pots using 400g of potting mix in each pot
- 2 plants were watered plain water, 10ml per day for 21 days
- 2 plants were watered with worm wee from the fruit eating worm farm
- 2 plants were watered with worm wee from the vegetable eating worm farm
- I measured the plant height and leaf size
- Results were recorded for each plant
- I will use an average of the 3 watering categories to see if any of them is different
- The plants were kept in the same spot, under cover with same light and heat exposure.
- We monitored the results for 3 weeks

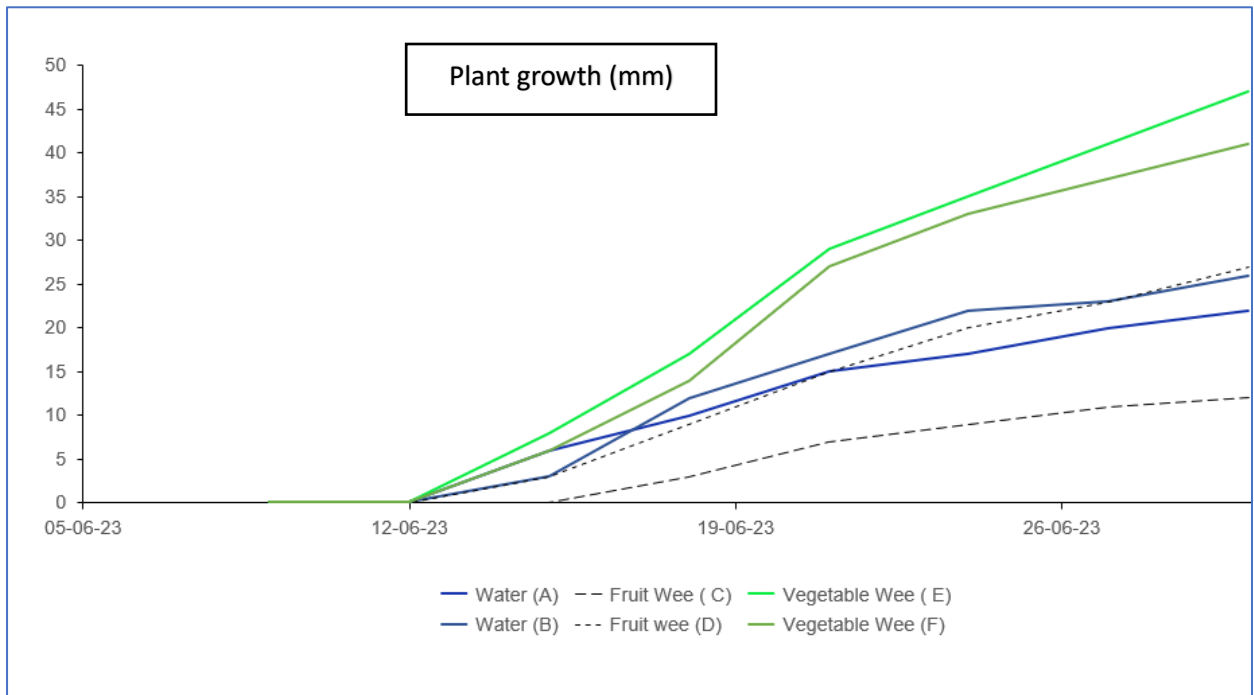
Materials:

- 2 worm farms
- 1000 worms
- 6 radish seeds
- 6 pot plants
- 2.4kg of potting mix
- 1 ruler
- 1 laptop
- Vegetable scraps
- Fruit scraps
- Bottles for worm wee / water
- Watering measuring device

Results:

Here is a table of the growth of each of the radish seeds:

Measurement (mm)	Date	Water		Fruit Wee		Vege Wee	
		A	B	C	D	E	F
Plant Height	09-06-2023	0	0	0	0	0	0
Plant Height	12-06-2023	0	0	0	0	0	0
Plant Height	15-06-2023	6	3	0	3	8	6
Plant Height	18-06-2023	10	12	3	9	17	14
Plant Height	21-06-2023	15	17	7	15	29	27
Plant Height	24-06-2023	17	22	9	20	35	33
Plant Height	27-06-2023	20	23	11	23	41	37
Plant Height	30-06-2023	22	26	12	27	47	41



Conclusions:

- Water A and Water B: When I just watered the plants with plain water (A and B), they grew a little, but not as much as the other stuff we used.
- Fruit Wee C and Fruit Wee D: The plants watered with fruit worm wee (C and D) also grew, but they were slower compared to the vegetable worm wee. There was one radish (C) that took longer to sprout and did not grow very well. This was an unusual one and should be ignored from the experiment.
- Vegetable Wee E and Vegetable Wee F: The plants watered with vegetable worm wee (E and F) grew the most! They got really tall and beat the other plants..
- It looks like using the special worm wees, especially the vegetable one, helped the plants grow taller. Water alone didn't do as much.

Results:

- After 3 weeks of testing, the veggie worm wee was the best!
- I knew it because it's got more yummy nutrients than the fruit worm wee and plain water

Evaluating:

- The study could be improved by monitoring the seeds for longer. We ran out of time!
- We could also measure other things like the leaf size and the size of the roots of the radishes as they may be growing more underneath the soil.

How could my experiment help others:

- I could give this information to a plant store like Bunnings and they could sell worm wee with their seeds or plants.
- I can give some worm wee to my Nan who loves gardening.

References:

Gardening Know How. "Care and Feeding of Worms." Available at: <https://www.gardeningknowhow.com/composting/vermicomposting/care-and-feeding-of-worms.htm> (Accessed on: April 30, 2023).

The Spruce. "How to Make Vermicompost Tea." Available at: <https://www.thespruce.com/how-to-make-vermicompost-tea-2539491> (Accessed on: April 30, 2023).

The Spruce. "Feeding Your Vermicomposting Worms." Available at: <https://www.thespruce.com/feeding-your-vermicomposting-worms-2539497> (Accessed on: April 30, 2023).

Dr Worms. "Worm Instructions - Dr Worms 500 Worms Packet."

OSA RISK ASSESSMENT FORM

for all entries in Models & Inventions and Scientific Inquiry

This must be included with your report, log book or entry. One form per entry.

STUDENT(S) NAME: Max Vella ID: @590-037

SCHOOL: School St ~~Thomas~~ Thomas

Activity: Give a brief outline of what you are planning to do.

What can grow more fruit wee of veg vee don't forget
water we will get ring the worm wee from 2 worm farms.

Are there possible risks? Consider the following:

- Chemical risks: Are you using chemicals? If so, check with your teacher that any chemicals to be used are on the approved list for schools. Check the safety requirements for their use, such as eye protection and eyewash facilities, availability of running water, use of gloves, a well-ventilated area or fume cupboard.
- Thermal risks: Are you heating things? Could you be burnt?
- Biological risks: Are you working with micro-organisms such as mould and bacteria?
- Sharps risks: Are you cutting things, and is there a risk of injury from sharp objects?
- Electrical risks: Are you using mains (240 volt) electricity? How will you make sure that this is safe? Could you use a battery instead?
- Radiation risks: Does your entry use potentially harmful radiation such as UV or lasers?
- Other hazards.

Also, if you are using other people as subjects in an investigation you must get them to sign a note consenting to be part of your experiment.

Risks	How I will control/manage the risk
None <u>working with</u> <u>mould.</u>	<u>I will wear gloves when working</u> <u>with the worms.</u>

(Attach another sheet if needed.)

Risk Assessment indicates that this activity can be safely carried out

RISK ASSESSMENT COMPLETED BY (student name(s)): max Vella

SIGNATURE(S): [Signature]

By ticking this box, I/we state that my/our project adheres to the listed criteria for this Category.

TEACHER'S NAME: Jane Edwards

SIGNATURE: [Signature] DATE: 28/6/23

Picture & Log Book

	<p>Today I went to Bunnings and got 2 worm farms. I am very excited for this project. I love worms and want to learn more about them.</p>		<p>I have built the first worm farm. It has 3 levels and the soil goes into the second level. This measures the soil temperature and dampness.</p>
	<p>I have 2 bags of 500 worms that I put into each worm farm. They are Doctor Worms brand and there are 4 types; Reds, Tigers, Blues and Nightcrawlers.</p>		<p>I have finally finished the worm farms. The left side will be fed fruit and the right side will be for vegetables.</p>
	<p>This is the fruit worm farm. I have put some leftover fruit for the worms to snack on.</p>		<p>This is the vegetable worm farm and here is some vegetables. The worms have been eating these vegetables for about one week.</p>
	<p>After 4 weeks we can finally get some worm wee. We added water to the farm every week and there was also rain. There is a tap at the bottom where the wee comes out.</p>		<p>This is the veg worm wee and the fruit worm wee in these bottles. The vegetable worm wee is darker in colour than the fruit worm wee. I think this is because there are more nutrients in vegetables.</p>



Here are 250g of fruit scraps. We feed this to the worms every week.



This is one week of food for the vegetable worm farm. This is 250g of vegetable scraps.



Now it is time to plant the radish seeds. We went to bunnings and got 6 plant containers to put the seeds in.



This is the bucket with the potting mix in it. We put 400g of soil in each pot



This is the dirt in the pots. We then made a small hole in the middle and put in the radish seed. If you look carefully the radish seed is bright blue!



All of the seeds are now planted. I am wondering which seed will grow the fastest. We have used 2 seeds for each type just in case one dies.



After we planted the seeds I have added 10ml of worm wee to the 2 seeds. I used my medicine straw to measure the worm wee. Also I did plain water for 2 of the seeds.



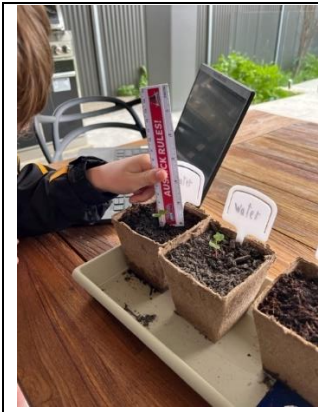
Me getting some vegetable wee. I put in 10ml per seed, which is 2 squirts with this medicine straw.



Here a the signs I put on top of the plants so I know what to feed them.



This is the plants grown a little. The water only seed was the first to sprout but the vegetable worm wee is catching up. One fruit worm wee seed is very small.



Me measuring all the plants. This ruler is good for measuring. I then put the numbers into Dads computer so we can measure the results. I think vegetable worm wee is going to win.



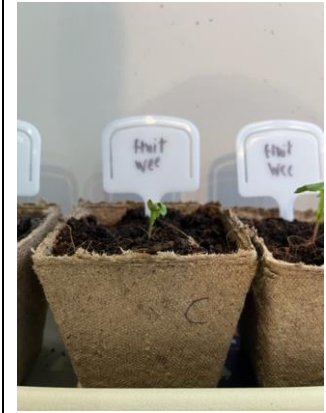
The final day after 21 days this is what it looks like. The winner is closer to you.



This is number (A) a plain water plant. It was first to sprout but then the others caught up.



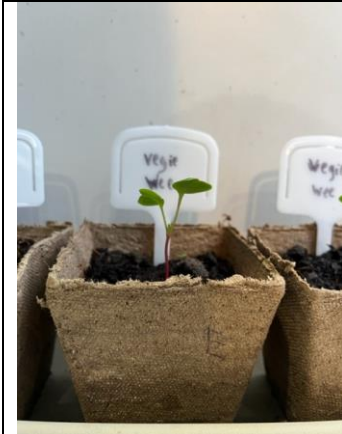
This is (B) A's twin was also winning with his twin but stopped growing.



This is (C) a water one it hasn't really grown very well and its quite small



This is Cs twin (D) still fruit but bigger it has been growing more it's the same age just looks older by a lot. D is quite big not as big as vegetable.



This is (E) and the winner! Vegetable wee is the best and this was the winner all the way through.



This is (F) and is the second place.

