

IYNT PROBLEM #14

SHENZHEN MIDDLE SCHOOL TEAM 1

ROUTERS & GARDEN CRESS

DOES THE WIFI SIGNAL INFLUENCES PLANT'S GROWTH?

- ▶ Our Assumption: Wi-Fi signal doesn't influence plant's growth.
- ▶ Parameter: Plant (soybean & mung beans)'s germination and growth.
- ▶ Why we choose the parameters: Our original parameters are the germination and growth of Garden Cress. For the reason that the time limits, also the general law should be represent in different forms, we choose soybean as our experiment subject and its germination and growth as our parameter finally.

THE FIRST PART OF OUR EXPERIMENT: SOYBEAN GROWTH RECORD

PROCEDURE (I): SOYBEAN GROWTH RECORD

- ▶ To satisfy the condition for a seed to germinate, firstly, we soak the dry and hard soybeans in water.
- ▶ Secondly, we prepare four plates with wet facial tissue spread in the bottom, and two working routers with powerful signal.
- ▶ With full preparation, we settles ten soybeans in four plates each, and range the four plates one by one with different distances from the routers. To make sure that the soybeans grow in a moist atmosphere, we also cover the plate with pieces of wet facial paper.
- ▶ The observation. We take a record of the soybean's changes every 4 hours.



SOYBEAN GROWTH RECORD

- ▶ Soybean Sample #1 (settled next to the routers)



- ▶ Soybean Sample #2 (settled 2 meters away from the routers)



- ▶ Soybean Sample #3 (settled about 8 meters away from the routers)



- ▶ Soybean Sample #4 (settled in another room, with no Wi-Fi signal covering)



COMPARISON & CONTRAST

	A	B	C
1		June 26, 12:00	June 26, 16:00
2	Soybean Sample #1 (settled next to the routers)	The soaked soybeans are settled on wet facial tissues, where the soybeans are all complete without deficiencies, waiting to sprout.	There aren't viewable changes.
3	Soybean Sample #2 (settled 2 meters away from the routers)	The soaked soybeans are settled on wet facial tissues, where the soybeans are all complete without deficiencies, waiting to sprout.	There aren't viewable changes.
4	Soybean Sample #3 (settled about 8 meters away from the routers)	The soaked soybeans are settled on wet facial tissues, where the soybeans are all complete without deficiencies, waiting to sprout.	One soybean begins its germination.
5	Soybean Sample #4 (settled in another room, with no Wi-Fi signal covering)	The soaked soybeans are settled on wet facial tissues, where the soybeans are all complete without deficiencies, waiting to sprout.	There aren't viewable changes.

COMPARISON & CONTRAST

	D	E	F
1	June 26, 20:00	June 27, 0:00	June 27, 4:00
2	Two soybeans germinate, with their germs swelling.	Totally, four soybeans germinate, with their seed coats cracking and their buds swelling; one of them is a little bit longer than others, which owns a sprout about	Totally, six soybeans germinate; huge rips appear in three soybeans' seed coat.
3	Two soybeans begin their germination, with their seed coats cracking and their buds swelling.	Three soybeans' germs sprout.	Totally, eight soybeans germinate, all of their seed coats crack because of swelling.
4	The soybean which berminated lengthens its sprout.	Two more soybeans germinate; Two old ones continue their growth, among them the longer one has the sprout long as the length of its cotyledon.	The four germinated soybeans continue to lengthen their sprout.
5	Three soybeans germinate, with their seed coats cracking and their buds swelling.	Seven soybeans germinate, one of them has seperated itself from its seed coat.	One more soybean germinate; all soybeans' seed coats are cracked.

COMPARISON & CONTRAST

	G	H	I
1	June 27, 8:00	June 27, 12:00	June 27, 16:00
2	The old six germinated soybeans continue their growth with shorter or longer sprout.	Totally, seven soybeans germinate; among them, four ones change their color from yellow into green.	Three soybeans are greener than others, while there're still three soybean haven't germinate.
3	All soybeans germinate; their sprouts are all longer than or long as half the cotyledon.	All soybeans continue their sprout's lengthen, nine of them begin to change their color from yellow into green.	Ten soybeans gain nearly the same growth, with the color of yellow and green.
4	Two more soybeans germinate; the germinated ones continue their growth.	Four soybeans begin to change their color from yellow into green.	They become greener, while there're still four ones don't germinate.
5	All soybeans germinate, with two of them gains far longer sprouts.	Six soybeans begin to change their color from yellow into green.	One soybean gains remarkable green color, and its sprout grows at least 2cm long.

RESULT

- ▶ Finally, 39 in four groups germinated. Some of them grew better (with longer sprout), but generally they all grew vitally, with nearly the same growing speed and rate of germination.
- ▶ These photos were taken 48 hours after the seeds were settled in plates.



Soybean Sample #1

All germinated



Soybean Sample #2

All germinated



Soybean Sample #3

Nine germinated

THE ONLY
DEAD SEED



Soybean Sample #4

All germinated

PROCEDURE (II): MUNG BEAN GROWTH RECORD

- ▶ To enhance our research's validity, we also take mung bean as our experiment object to continue our process.
- ▶ This time, to take it clearly and effectively, we set the mung bean sample #1 next to two working routers and set the mung sample #2 in basement with no Wi-Fi signal covering.

THE SECOND PART OF OUR EXPERIMENT: MUNG BEAN GROWTH RECORD

RESULT

- ▶ Sample #1 (next to the routers), grand total: 174 mung beans

After 12 hours, 101 mung beans germinated;

After 48 hours, 134 mung beans germinated

Rate of germination: $\approx 77.0\%$

- ▶ Sample #2 (in the basement), grand total: 151 mung beans

After 12 hours, 89 mung beans germinated;

After 48 hours, 140 mung beans germinated

Rate of germination: $\approx 92.7\%$



THE SECOND PART OF OUR EXPERIMENT: MUNG BEAN GROWTH RECORD

RESULT ▶ To our surprise, the mung beans which grew under non-Wi-Fi condition (basement) got fatter and more vital.



CONCLUSION

- ▶ The soy beans were not affected much, but the influence on mung beans is direct and clear (the rate of germination; growth development).
- ▶ The Wi-Fi signal may influences some particular kinds of plants' growth (we may not definitely say "it does" or "it doesn't" influence).

Thanks for your attention!