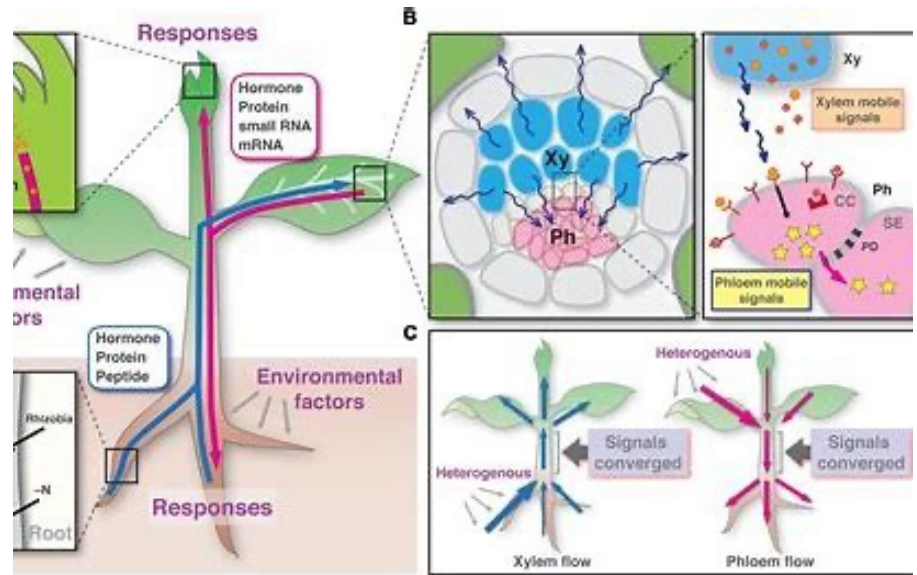


There's more to plants

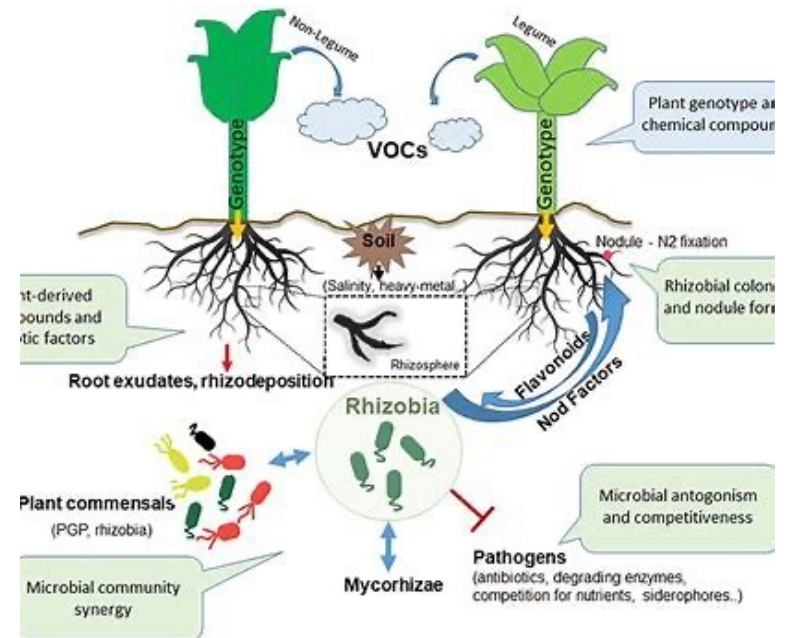
Thinking, perceiving, feeling, are just the beginning of the complex life of plants!



How plants think?

Can memory, consciousness, and communication be applied to plants?

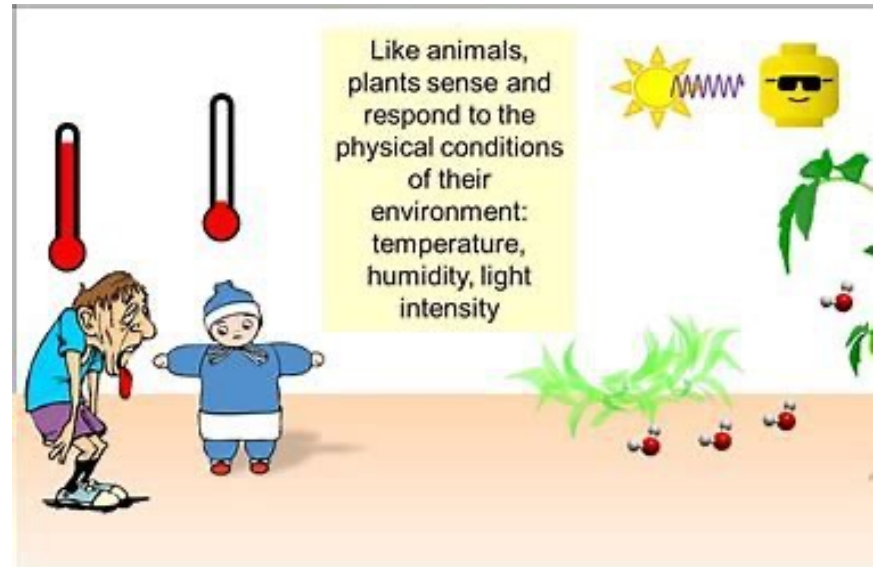
Plants show sensitivity to sound, store information, and communicate with other plants and with animals.



What do plants sense?

Plants sense light, touch, chemicals, microbes, animals and temperature, in unique ways. Plants sense light through photoreceptors and touch through mechanoreceptors. Temperature is remembered, and vernalization tells the plant when to flower. Plants can sense herbivore danger and produce protective responses.

Plants communicate with each other and other living things with liquid and volatile chemicals. This allows plants to develop symbiotic relationships or send a warning.



How do plants communicate and react?

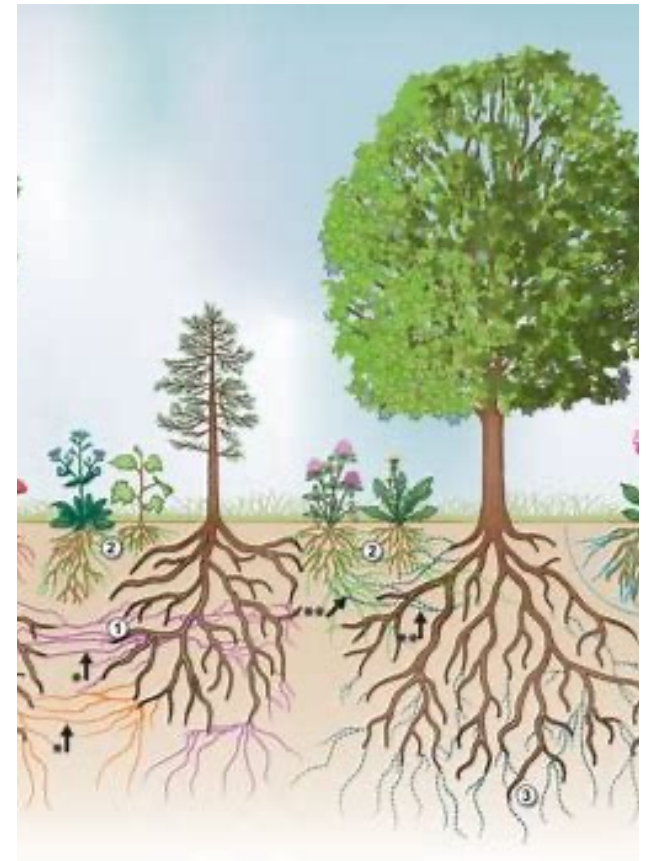
Plants can experience stress. Sensitive plants fold their leaves to protect them.

The Venus flytrap awaits two time-delayed touches to differentiate debris from food.

Plants react to the sounds of caterpillars chewing or bees buzzing by producing protective chemicals and increasing sugar content.

Tree roots partner with fungi to produce mycorrhizal networks which can pass warning signals to each other.

Plants can change their feature to mimic what they are growing on and move to get the best light.



The color of flowers is one of the ways plants *talk* to critters to get them to disperse their seeds and pollinate.

Red beckons birds.

Blue, purple and yellow beseech bees.

Moths and bats seek white.

Brown attracts flies.



Thinking about plants....

Plants made animal life possible.

Plants helped create the physical and climatological environment.

Plants are the primary producers of nutrition.

Plant scientists say we have “plant blindness” just seeing plants as a mass of green, rather than the complex life forms they are.

Scientists trying to understand plants wonder if plants have personality, altruism, kinship, society, history—we have complex relationships to plants.

Plants have complex ways of encountering the world.

Plants move by growing and climbing.

Plants respond to predators by changing the chemistry and morphology of leaves and other structures.

Plants are more responsive to signals from genetic kin, and try to optimize cooperation with closely related plants, while competing with unrelated plants.

Some scientists consider the various mixes of volatiles to be *plant language, vocabulary and sentences.*

Electrical signals in plants drive individual responses and trigger biochemical reactions.

Plants are *aware* of touch.

Some bats seem to have an auditory relationship to the amount of nectar in the plant.

Some climbing vines appear to count coils.

Some plants *recruit* insect collaborators.

Some plants can change to mimic others.

Plants see with variations in the ratio of colors in light.

Some plants appear to be eusocial.

Roots *forage* for nutrition.

Some plants seem to demonstrate spontaneous *decision making.*

Plant-thinking song to *Have You Ever Seen a Lassie*

Have you ever seen a sunflower, (hand at forehead)

A sunflower, a sunflower,

Have you ever seen a sunflower

Go this way and that?

Now follow the sun, (fist up high)

'til daylight is done,

Have you ever seen a sunflower (hand at forehead searching)

Go this way and that?



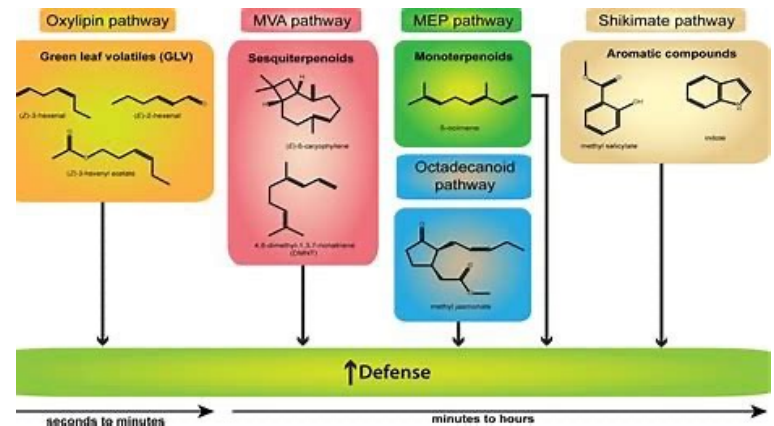
Finger thinking plants!

A plant can recognize danger, (looking scared)

A plant can welcome friends, (looking happy)

A plant can make a warning, (2 protective hands in front of face)

And to the network sends! (2 hands spreading out)

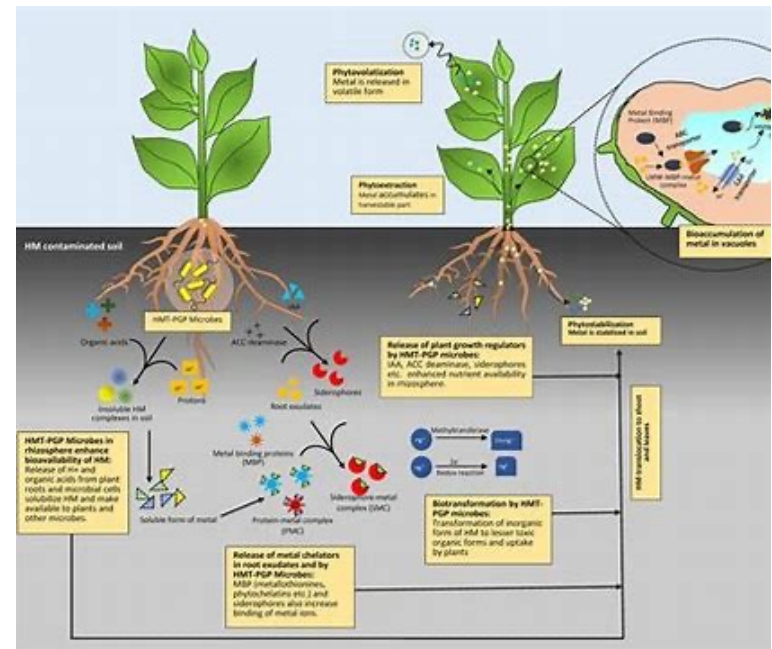


Understanding plants....

As you walk, do you see signs of plants reacting?

On the next page draw all the ways the plants might relate to each other.

What foods could you use to show plant relationships?



How might the plants communicate with each other?



Our thoughtful chatty plants!

Yes, plants communicate!

