

## Earth Day 2020

Choose one activity, complete it, & turn in proof (picture, description, etc.) in an email!

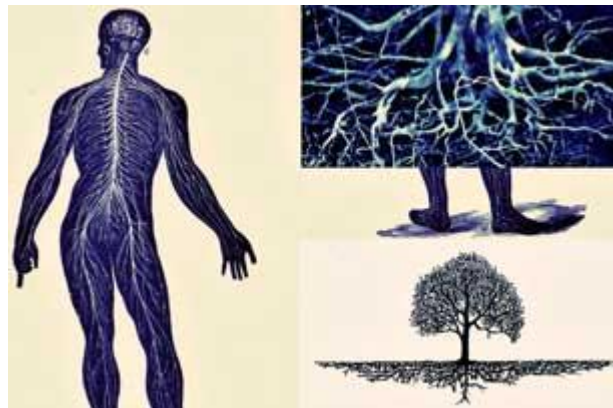
I miss you, precious one!

1. Find 3 examples of parallel lines outside. What are they? Where did you find them?
2. Read a book outside for at least 30 minutes (what you read is up to you)
3. Create a piece of art using recycled materials (used cans, plastic, etc.). Take a picture and send it to me or describe what you made and what you used to make it.
4. Take a walk and journal about what you see. (sights, sounds, smells, textures, micro and macro)
  5. Listen to bird calls and see if you can identify one call.
  6. Build a solar car or oven using directions from youtube.
7. Just like in the book by Dr. Seuss, *The Lorax*, real life plants communicate! Read about how they talk and warn each other by reading the article below and then write a sentence describing how it works.
8. Watch the you tube movie from PBS "What Plants Talk About" and tell someone about it or email me and tell me about it.
  9. Sketch a detailed drawing of a plant, flower, or leaf you find outside.
10. Build a fort outside and hang out inside it for a little while. What feelings arise while you are in there?

### Article for #7

"How Plants Communicate" by: Education World

It's clear that living things with eyes, ears and mouths can communicate, but what if these organs aren't present? Plants are often seen as sedentary organisms with little going on except for feeding and growing, yet we are learning that plants are doing far more. While not taken seriously at first, the science of plant communication continues to develop.



Plant Communication

An ecologist at the University of California, Richard Karban is in the northern Sierra Nevada studying plants' communication, in the hopes of deciphering their "language." A story, reprinted in *Wired* with permission from *Quanta Magazine*, follows Karban's journey.

The article discusses two studies, published in 1983, that demonstrated how willow trees, poplars and sugar maples send warning signals to each other regarding insect attacks and infestations. In response, trees that had yet to be attacked started sending out their own natural bug repellent in preparation for the approaching pests. This indicated that the trees were actually communicating in a very sophisticated way.

Scientists studied the trees in a variety of settings and were able to *replicate* the findings (i.e., obtain them multiple times).

University of Lausanne scientist Ted Farmer is also central to the *Wired* article. He discovered that plants actually send messages via electrical pulses through a voltage system, not unlike the nervous system of an animal. The article notes, however, that this doesn't equate to plants having neurons or brains.

Farmer and his team hooked *Arabidopsis thaliana* leaves and stalks to tiny microelectrodes. Then they let the plants be consumed by Egyptian cotton leaf worms. Voltage changes radiated from the damaged plant tissue to the stem, moving out into the rest of the system. The result was a defense compound (known as jasmonic acid) building up all over the plant.

The plant genes that transmit the electrical signals make channels in membranes just within the plant's cell walls. These channels regulate the passage of the charged ions and are similar to the ion-regulating receptors present in animal sensory systems.

According to Farmer, many parallels exist between plants and humans, and he believes there's a common ancestor in the evolutionary line.

Plants also communicate through the air. Just about every green plant has its own chemicals that alert other organisms. The article points out that the smell of cut grass is actually a danger signal for other plants.