CSforCA

Computational Thinking for Kids

*Are you a parent interested in bringing basic computing skills to your kids? The **UCLA Computer Science Equity Project***'s own Roxana Hadad and Sharisa Chan, both computer science educators and moms with littles, share a fun computational thinking activity you and your little ones can do at home. No computer needed! Follow the activity description below and read more about how this resource was created **here**.*

Introduction

We love to enjoy beautiful plants and flowers with our kids, especially when they come from our own garden! But as much as we love doing this activity together, we're not exactly master gardeners, so sometimes our flowers aren't looking so good. It's bad news for our flowers but great news for practicing some **Computational Thinking (CT)**: problem solving and critical thinking skills involved in Computer Science (CS) that are used in our everyday lives and in a variety of subjects. This activity introduces the CT practices of **decomposing**, **pattern recognition**, **abstraction**, and **evaluation** while working with plants. That way, we'll learn more about our plants—and more about how to be good critical thinkers and problem solvers in the 21st century!

Activity: *How Does Your Garden Grow?*

We can use the problem of our droopy plants and start **decomposing** the problem into smaller chunks. Breaking down a problem like this makes it easier and more manageable than just having one big problem of a dying plant.

- ✅ How much sun does the plant need?
- ✅ How much water does the plant need?
- ✅ What type of soil does the plant need?
- ✅ How much fertilizer does the plant need?
- ✅ What animals or bugs like to eat this kind of flower?

Activity: *How Does Your Garden Grow? (continued)*

Next, we can look for similarities. Practicing **pattern recognition** makes solving problems easier – because we can use the same solution wherever we see the pattern! For instance, if we notice that plants suffering in a sunny spot have thin leaves and large surface areas, we then can identify the solution to move similar plants with thin leaves and large surface areas to a shady place.

We can also practice **abstraction** by discarding unnecessary information for solving our problem. Does the name of the flower or the color of its petals matter when determining what it needs to be healthy?

We can then **evaluate** our solutions. Did a change in location/watering/soil/fertilizer help the health of the plant? Now that the plant is healthy, are there small changes we can make to our solution to make it even better? For example, how can we help it grow more flowers/fruits/vegetables?

Did You Know?

CS and CT focus on what can be accomplished with a computer. The activities here don't use a computer but highlight how you can practice CT skills before you even sit down at your laptop. Helping kids engage with CT through real-world experiences like this can expose kids who don't think computer science is for them to real-life problem solving skills that are also used in computing careers and fields. Did you know **computer scientists work with farmers to design and engineer solutions to help crops grow**? These agricultural computer scientists may work on systems where they monitor what plants grow best together, or how weather conditions, fertilizer, pesticides, and moisture in the soil impact crops.

Additional Activities:

- Is your child interested in monitoring soil moisture? Check out **Micro:bit's soil moisture monitoring tutorial**.

- Is your child interested in how weather affects plants? Check out **Raspberry Pi's Build Your Own Weather Station tutorial**.