

Garden Task

Watering

Watering is a critical task to keep the garden healthy. Gardeners continually monitor and make decisions around when to provide water, which plants to water and ways to conserve water.



Connections to Science Content

What do we need to know in order to do the garden task?

Cycles: understanding the hydrologic cycle is important since it is how water reaches the plants. It is important to learn about your local watershed, water table and how structures (buildings, roads, etc) affect the water flow in and around the garden.

- For example, if there is frequent flooding or standing water, in and near the garden in the spring and fall, the gardener may plant a rain garden to slow down the flow of water.

Needs: understanding plant water needs is essential to water sustainably.

- For example, I know plants soak up the soil with their roots, so I will water deeply at the root (not the leaves) to encourage deep root systems. However, I will water my lettuce more frequently because of their shallow roots.

Geology: it is important to consider soil composition, porosity, and filtration; slopes, structure of the land.

- For example, I might terrace a garden on a hillside to prevent runoff of soil when watering.

Phenology: Water needs vary by season. Gardeners consider the impacts of climate change on watering needs in the future for planning (i.e. more flooding/ drought)

- For example, I might consult the farmer's almanac or weather record to determine if I need to water. I would also consider daytime temperature, sunlight and the optimal time of day for watering.



Garden Methods

What are methods we use to do this garden task?

Determine Sources of Water:

- Rain/snow
- Streams/creeks
- Runoff from parking lots, or roads
- Municipal water
- Water table

Storing Water:

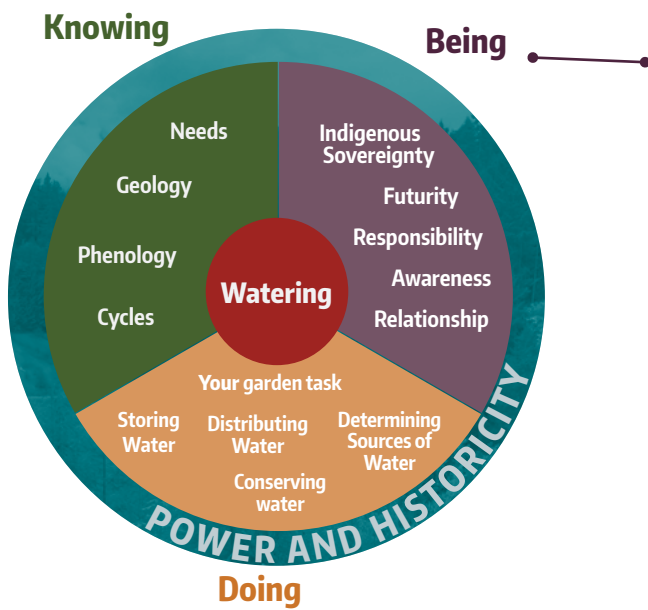
- Rain Barrels
- Cisterns
- Tanks

Conserving Water:

- Mulch to conserve moisture
- Match plant water needs with climate
- Water in the morning or evening
- Using soaker hoses
- Water the roots of the plant

Distributing Watering:

- Determine if watering is needed:
 - » Two finger tests or roll soil into a ball -- does it bind or unbind?
- Methods:
 - » Hand watering
 - » Overhead sprinklers
 - » Soaker hoses
 - » Irrigation system (set up timers, adjust, winterize lines, shut off water, etc)
- Create watering schedule



Importance/Intent

Why does it matter to me/my family/our broader community to do this garden task? How does this garden task affect people outside of my community?

Our garden decisions are driven by the values of our communities and families:

Indigenous Sovereignty:

In 2016, Indigenous tribes resisted the Dakota Access Pipeline because their sovereign rights were violated by the pipeline that could leak and damage waterways that are crucial to their lives. What are our ethical responsibilities to Indigenous peoples and the water that flows between nations?

Futurity:

It is important to consider the lasting impacts of the garden method (5 years, 20 years, 100 years). Are you gardening in a way that ensures soil communities will thrive into the future?

- *How will we need to change our watering methods to respond to climate change?*

Responsibility

Gardeners have a responsibility to conserve water and use it wisely. While also having a responsibility towards plants to ensure their water needs are being met.

Awareness

Spending time watering in the garden may make us more aware of the importance of water and appreciate the beauty in our garden. Paying attention to our watering decisions may bring about awareness of those 'downstream' from us, those who will be impacted by our actions.

Relationship

Watering our garden reveals our collective relationship to water. This includes being in relationship with plants and their basic needs. As well as our (human) relationship with water; humans are mostly water!



CONNECTING TO OTHER GARDEN PRACTICES

- **Soil Health:** matching watering practices to soil composition and filtration, watering the compost pile to maintain appropriate moisture levels, excess fertilizer can wash away into waterways and cause algae blooms,
- **Garden Planning:** plants with similar water needs planted close together, selecting plants in swales for water uptake and pollutant from streets.
- **Planting:** adjusting watering schedule when planting seeds or transplants
- **Supporting Balance Between Species:** not watering the leaves to prevent plant diseases or choosing to spray the leaves with water to remove bugs, using insecticides/herbicides/fungicides can negatively affect beneficial insects as well as the health of nearby waterways.

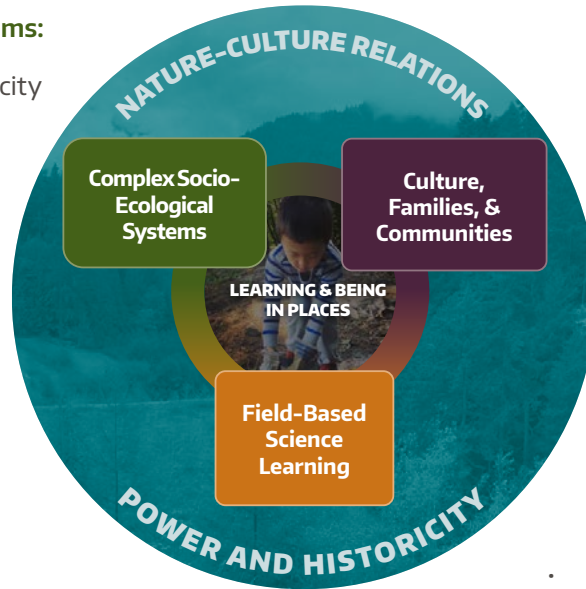
Engaging the Learning in Places Rhizome with Practice

Power and Historicity; Nature-Culture Relations:

- What are people's relationships with local waters? How has that relationship changed? What infrastructure is in place to 'control' water?
- Who has rights to water?
- Where does your water come from and who controls it?
- Who is upstream from your water sources? Who is downstream from your water source?
- Who impacts our water? How do we impact others' water (more-than-human)?
- How much does water cost?

Complex Socio-Ecological Systems:

- What regulations exist in the city around rainwater collection? Why?
- How much does water cost? Why do we pay for water and who pays for it?
- Global connections: In many cultures in Asia terraces are used to cultivate crops while protecting slopes from erosion. The Mayans stored water underground in stone reservoirs to use during the dry season.



Culture, Families, and Communities:

- Water can be a significant spiritual or religious symbol for communities. Is water a significant symbol in your community?
- Who has access to water in your community?

Field-Based Science Learning:

- Data & Modeling: How can you test for water quality? Does the wildfire smoke in the summer make the water more acidic or basic?
- Questions & Wonderings: How does water move through the place you are in? How does it move across different surfaces? Who and what is it interacting with?

Storyline Examples for Watering

LE 2: Common “Should We” questions

- » Should I set up/use an irrigation or watering system?
- » Should I collect rainwater?
- » Should we plant a rain garden?
- » When/how should we water our garden?

LE 4: Garden Methods

- » To determine if they need to water, gardeners often do a two finger test (to see if there is moisture) or they roll soil into a ball (does it bind or unbind).
- » Identify source of water (rain barrels, hose bibs, kinds of infrastructure needed, is water clean?) and method of water (irrigation, sprinklers, hand watering)
- » Gardeners determine watering needs as it relates to: weather, temperature, sunlight, soil composition, water tables

- » To water deeply, efficiently, sustainably, gardeners consider the different watering needs of plants, mulch to conserve soil moisture and select an appropriate method of watering.

LE 6: Data Collection Connections

- » How does soil moisture respond to daily changes in temperature/precipitation? (Daily/Weekly/Monthly Weather Protocol)

LE 6: Sample Investigation questions

- » What types of soil are in my garden? How does soil type relate to moisture? (Soil Moisture Protocol)
- » How is the soil moisture different in different parts of the garden? (Soil Observation Protocol)