

# TEACHER GUIDE

## THE THREE SISTERS

### DAY 1: NATIVE WAYS OF KNOWING MOTHER EARTH

#### 5 minutes - Introduce the Topic

“Mother Earth” is a common reference used by many cultures around the world to describe the planet earth as a “mother,” “woman” or “goddess.” From an Indigenous perspective, mother Earth prepares herself through the annual cycles of seasons. From a biblical standpoint, the “first man,” Adam, subsequently joined by his wife, Eve, was placed in a garden and charged with the God-given duty to “tend and keep” his environment (Genesis 2:15).

The two Hebrew words used are instructive. Tend, or till, derives from the same root as the verb to serve, so a relationship of service was intended. The instruction to “keep” comes from the verb to guard, so that humans were charged from the beginning with serving and guarding the environment from which they were made.

These Judeo-Christian instructions changed over time, as Western society evolved from an agrarian economy based on bartering to complex capitalism, which relies on the never ending extraction of natural resources. The idea that land exists to be used in any way, and that the earth’s resources are endless was used to justify societies’ expansion through colonization. Many societies, including ours, lost the teaching that humans need to take care of the earth -- stewarding all life forms-- and not take too much.

Irrespective of how one reads the account of the creation of Adam and Eve in Genesis 2, the “use and abuse” concept of land use was not to be part of their thinking.

If there is time, ask 3-4 students to share their personal definitions of Mother Earth.

[\[Additional teacher support for this presentation\]](#)

#### 20 minutes - Video and Worksheet

Distribute the video worksheet, “Robin Kimmerer – Mishkos Kenomagwen: The Teachings of Grass.”

Play the video [Robin Kimmerer - Mishkos Kenomagwen: The Teachings of Grass | Bioneers](#)

Have students complete the video worksheet.

## DAY 1: NATIVE WAYS OF KNOWING MOTHER EARTH (CONT.)

### 10 minutes - Lentil Experiment Teacher Instructions

*\*All seeds must be pre-soaked in water for 24 hours.*

Today is the day we will learn the name and familiarize ourselves with the honorable plant, lentil. Lentils are part of the genus, lens, which is contained in the flowering plant family fabaceae , commonly known as legume or bean.

[Additional teacher support for this presentation: [Origin of the Words Denoting Some of the Most Ancient Old World Pulse Crops and Their Diversity in Modern European Languages; It's True - You Really Should Talk To Your Plants](#)]

We will be speaking with the lentil for three days and observing the results. We will be angry with lentils and we will be happy with lentils. Most importantly we will listen to Lentil. Let's begin.

Distribute the "Lentil Planting Experiment" instructional handout, and materials to students. to all students and have them read and follow the directions for Day 1. (If this is an online class, make sure that all students have been supplied with all necessary materials.)

About 4 to 5 hours after class, repack all lentils into the corresponding cups and the a rinse, you will need to repeat this step in the morning,afternoon and evening of each class day.

1. At the end of day have students place all the "sad" lentils in front of the class and make notes on seedling growth and water coloration
2. Repeat this step for all of the "Happy Lentils."

[Additional teacher resource]

### 2 minutes - Introduce "Who is Mother Earth?" Homework

Distribute the homework handout. Review it and answer any student questions.

Assign students to read [Oneida Nation Legend of Three Sisters](#) on their own.

## DAY 2: THE THREE SISTERS

### 5 minutes - Lentil Experiment

Have students say positive and negative things to their lentils.

### 5 minutes - Introduce the Topic

As you learned in your reading - Corn, beans, and squash are called the Three sisters. For hundreds of years these three crops have been the center of Native American agriculture and culinary traditions. It is for good reason as these three crops complement each other in the garden as well as nutritionally. Corn provides tall stalks for the beans to climb so that they are not out-competed by sprawling squash vines. Beans provide nitrogen to fertilize the soil while also stabilizing the tall corn during heavy winds. Beans are nitrogen-fixers meaning they host rhizobia on their roots that can take nitrogen, a much needed plant nutrient, from the air and convert it into forms that can be absorbed by plant roots.

[Teacher extension for science classes: [Nitrogen Fixation: Fixing the Gap Between Concept and Evidence-Based Learning with Legume Biology](#)]

The large leaves of squash plants shade the ground which helps retain soil moisture and prevent weeds. This method of symbiotic planting deters weeds and pests, while enriching the soil and supporting each other. These three crops are among the most famous companion plants around the world because of their practicality and the abundance of food that each plant generates. You could survive off of just these three plants all year round.

The Three Sisters grow best in loose, well-drained soil that is 60 to 85 degrees fahrenheit, nitrogen heavy, high in water capacity, and rich in organic materials. Corn is planted first. Once the corn has grown 6 inches to a foot tall - or strong enough to support the beans, beans are planted. Squash is planted about a week later. The phase of the moon even affects the growth of the Three Sisters.

Although different tribes used different kinds of fertilizers, fish was used by many different groups. Today, compost, peat moss and manure are also good amendments to enrich the soil. Corn should be planted during a waxing moon

The tradition of calling these crops the "Three Sisters" originated with the Haudenosaunee, pronounced Ho-deh-no-shaw-nee. Also known as the Iroquois, Haudenosaunee occupy the regions around the Great Lake in the Northeastern United States and Canada. All three types of seeds are planted together in the same mound in the Haudenosaunee planting method. The elevated mound assists with drainage and avoids water logging of the plant roots which is important in this region that receives abundant rainfall in the summer.

## DAY 2: THE THREE SISTERS (CONT.)

Planting the Three Sisters in the order of corn, beans, and squash will ensure that they will grow and mature together and will not grow at the expense of another Sister. Sister Corn should be planted first so that it can grow tall above the other crops. Plant seeds for Sister Bean 2-3 weeks later, or at least when the corn is a few inches tall. When the beans are sending out tendrils to climb the corn will be tall enough to support them. Plant Sister Squash seeds 1 week later after the beans have emerged. You don't want the large squash leaves to shade out young corn and bean seedlings before they have time to establish.

[Additional teacher resources: [The Interworking of the Three Sisters](#); [The Three Sisters: Corn, Beans and Squash](#); [Food Yields and Nutrient Analyses of the Three Sisters: A Haudenosaunee Cropping System](#); [How to Plant By The Moon's Phases](#); [How Legumes Fix Soil](#); [How to Grow a Three Sisters Garden](#); [The Three Sisters: Corn, Beans and Squash](#); [Chickasaw Three Sisters](#)]

### 5 minutes - Play Video

[Robin Kimmerer - Three Sisters on Vimeo](#)

### 25 minutes - Group Activity: Planting A Three Sisters Garden

Split students into groups of 3-5 members.

Distribute the "Planting a Three Sisters Garden" group activity handout along with the [How to Grow a Three Sisters Garden](#) handout. Review the directions and information on both handouts and have students fill in the activity worksheet.

Take the last 5 minutes to query students to volunteer why their group chose each of the layouts: mound, field and landscape layouts. Query the groups by layout the numbers they came up with. For example:

"Pick a spokesperson from your group. For every group that selected mound, how raise your hand when I say the closest number counting by 5s to the number you determined. Okay, we'll start with corn at 20, 25, 30, 35, 40, 45, 50. And now beans at 20, 25, 30, 35, 40. And finally squash at 5, 10, 15."

Repeat for each layout and reflect, or ask the students to reflect on the patterns they observe.

### 5 minutes - Introduce "Growing The Three Sisters" Homework

Distribute the homework handout. Review it and answer any student questions.

## DAY 3: INDIGENOUS PERMACULTURE

### 5 Minutes - Introduce the Topic

The term permaculture — a fusion of “permanent” and “agriculture” — was first coined in the 1970s by two Australian men, David Holmgren, and Bill Mollison. The foundations of permaculture rest on two concepts: 1) an understanding and acceptance of the diversity of whole systems, as opposed to the soil-degrading effects of industrial monoculture; and 2) on the relational, slow-yet-dynamic practice of observing the land, and its many complex ecosystems.

[Additional Teacher Resource: [The Indigenous Science of Permaculture](#) ]

What is the basis of Indigenous Permaculture?

**1. The recollection and recognition of, and respect for Indigenous contributions.**

For us, this means more than giving lip service to generic, Indigenous contributions. We strive for active, respectful and reciprocal contact and collaboration with Indigenous communities where we live and work to learn about traditional ways of being, always careful to not engage --consciously and unconsciously-- in cultural appropriation. We recognize and cultivate leadership of Indigenous Peoples in their communities as well as within our diverse organizations and institutions. We commit to share our own knowledge and to give back to Indigenous communities.

**2. Traditional Ecological Knowledge has always been specific to a place and culture.**

All indigenous and traditional ecological knowledge systems have been specific to a place and have been transmitted across generations through cultural mechanisms, including storytelling and ceremonies. While it is useful to understand some of the general principles common to most systems of Indigenous knowledge, it is also important to develop a strong understanding of and appreciation of the specific cultures and Mother Earth based contexts within which these systems come alive.

**3. Decolonization of our minds, our language, our work, and our communities.**

We live in a colonial society and are the products of historical colonial processes. This is not simply something that occurred in the past and we can now all happily move on with our lives. These processes are very much alive today and Indigenous communities continue to live under direct and indirect attack. Much of the mining of fossil fuels as well as of the rare metals such as lithium and neodymium which are supposed to fuel the new green revolution takes place in Indigenous territories. In order to come together as Indigenous and non-Indigenous people to build a better world for the next seven generations, we must recognize this history, ongoing structures of oppression and ecological destruction, and commit to transforming its legacy. This means an explicit commitment to stand with communities under attack, and to work with them to defend and restore their cultures and traditions, as well as help them assess and incorporate new technologies and skills in a culturally appropriate way. It also requires a commitment to become aware of our full history and decolonize our language, our work, our processes and to challenge eurocentrism and white privilege in our organizations, communities, and permaculture at large.

## DAY 3: INDIGENOUS PERMACULTURE (CONT.)

### 4. Being and becoming native to this place.

Permaculturists are fond of saying that, “we are all Indigenous,” or that we all come from Indigenous roots, but the reality is that being native to a place does not happen overnight. To quote Luther Standing Bear, “[m]en must be born and reborn to belong. Their bodies must be formed of the dust of their forefathers’ bones.” We recognize that there are significant differences between being Native by having been raised in a culture and community that is part of this place since time immemorial, and striving to become native by learning how to live in a place as part of it. We also recognize that permaculture and its call for “protracted and thoughtful observation” offers an excellent set of tools and practices that we can use in our journey to become truly native to our places.

### 5. Eco-cultural restoration.

The preservation and restoration of natural places requires the preservation and restoration of the cultures that have lived in those places since time immemorial. It is not accidental that some of the places in the world where bio-diversity is the most threatened are also places where Indigenous languages are endangered. We are also working towards the reintegration of humans and nature by challenging many of the distinctions so prevalent in the West, between the domesticated and the wild. This is where we disagree with one of the permaculture aphorisms, “stay out of the bush, it is already in good order.” Indigenous cultures have often not only lived in the “bush” but have also played an active role in maintaining and enhancing its “good order.”

[Adapted from Teacher Resource: [Indigenous Permaculture: An Operational Framework](#)]

### 25 Minutes - Play Video

[The Great Laws of Nature: Indigenous Organic Agriculture](#)

### 5 Minutes - Introduce Homework, “Three Sisters Take-Home Quiz”

Distribute the homework handout. Review it and answer any student questions.

## DAY 4: PLANT RELATIVES AND CONSCIOUSNESS

### 15 Minutes - Lead a Class Reflection

On their own, have students reflect and write about the lentil experiment. Share the following prompts with the class:

1. What do you think the point of the lentil experiment was?
2. How did yelling at your lentils make you feel?
3. How did being kind to your lentils make you feel?
4. Do you see that there is a relationship created between yourself and the plants around you?
5. Could this experiment be replicated on a broader scale to show larger societal impacts on the natural world? Why? Why not?

### 30 Minutes - Class Discussion

**First 10 minutes** - Have students share their reflections about the lentil experiment. Offer a takeaway point that humans are nature, and humans and all of nature are interdependent. This is why even plants have been scientifically proven by both Indigenous science and Western science to respond to humans differently depending on how they are spoken to.

**Next 10 minutes** - Prompt the class:

- Based on what we have learned this week, what do you think it means when people say, “plant and animal relatives?”
- What does it mean to be interconnected?
- What are some things we can do in our everyday lives to be more fully aware and appreciative of this interconnectedness?

**Final 10 minutes** - Have students share their responses to the essay question:

- Why is it important to learn from Indigenous science? Try to gather as many different reasons and examples as possible.