**Solstice Gardening in Ancient Civilization**

***Total time ~\_\_ minutes***



**Overview**

Students will learn how ancient Aztec and Mayan gardening practices utilized the solstice and equinox, as well as how those practices are relevant today.

**Objectives:**

After this lesson students will be able to:

**🐝 Identify** how ancient practices are relevant today and are reflected in modern practices

**🐝 Explain** the importance of astronomy in ancient times

**🐝 Describe** how gardening was done and what was planted

**🐝 Identify** when to plant and harvest crops

 **Vocabulary:**

🍓 **Sundial**: A tool that utilizes shadows cast by the sun to track the 24 hours in a day

🍓 **Solstice**: Occurs twice a year and is the longest and shortest days of the year. It is caused by the earth’s position being the closest and furthest from the sun.

🍓 **Equinox**: Occurs twice a year, when the sun’s position causes day and night to be of equal length

**Learning Activities**

🐞 **Discuss:**

* Introduce the lesson: Solstice Gardening in Ancient Americas.
	+ **Ask**: *When we say "Ancient Americas", what civilizations come to mind?*
		- Students may recall who the Incas, Aztecs, and/or Mayans are from previous lessons.
* Present the objectives (listed above)
* **Ask**:*Have you ever planted anything? If so, how did you know that it was time to plant?*
	+ If you did not have a calendar, what would you do? If you didn’t have a clock or a laptop how would you keep track of seasons and time?
	+ This is intended to get students thinking about seasons and time. Astronomy is a central component of the lesson.
* Introduce the *sundial*. Explain that it works similarly to a clock through the use of shadows and the sun’s movement, but tracks 24-hours in a day.
* **Ask** students if they are familiar with a *solstice*.
	+ Start with elbow partner discussions
	+ Share ideas as a class
* Explain that a solstice is the longest and shortest day of the year
	+ Longest day is around June 21st, in the summer
	+ Shortest day is around December 21st, in the winter
* **Watch** solstice explanation video.
* Explain that an *equinox* occurs between solstices, twice a year as well.
	+ Elbow partner discussion: *What is an equinox?*
		- Use prefix and root of word to decipher the meaning
		- Share as a class.
* Define *equinox*: Latin for “equal night.”
	+ During an equinox there are equal parts of night and day. When they occur, they mark the beginning of spring and fall.
* **Ask:**  *What agricultural practice occurs in the spring?*
	+ Planting seeds
* **Ask:** *What agricultural practice occurs in the fall?*
	+ Harvesting crops
* Ancient Americans knew how to use the solstice and equinox to inform their gardening.
	+ Refer to the example of a sundial to explain how ancient architecture functioned in a similar way, using its shadows.
* Explain how Chichen Itza’s Temple of Kukulkan
	+ The “Snake of Sunlight” represents he spring equinox: a transition to a time of fertility and prosperity (i.e. spring).
* Mayans planted beans, corn, and squash in the spring to harvest it in the fall.
* Explain “disclaimer” to students: *For the purposes of this lesson, we have primarily discussed seeds planted in the spring and harvested in the fall. Please note, however, that all sorts of planting and harvesting timelines exist.*

**🐞 In-Class Activity:** Handout #1-Reading Seed Packets

* Explain the following to students:
	+ As opposed to in the past when people relied on events like the solstice and equinox to know when to partake in certain farming practices, today people rely on printed and digital information, which is available anywhere from calendars, Google, and textbooks to—you guessed it—seed packets.
* Distribute sample seed packets (as many as are available) to students around the room and allow them to examine the seed packets on their own before passing them along for other students to look at. Simultaneously, distribute “Handout #1” for students to look at and work together on while waiting their turn to study the physical seed packet. The goal of this activity is to help students realize that different crops get planted and harvested at different times. Foster a casual discussion in which students can share what information they were able to learn from the seed packets.

**🐞 Garden Activity:** Handout #2-When to Harvest Different Types of Crops

* Before heading out to the garden, distribute “Handout #2” and inform students that the next class activity is intended to help give even more insight into how people know when to harvest a crop. What we read on seed packets and in books, etc. serves as a good guideline, but the best way to truly know if a crop is ready to be harvested is to perform a sensory evaluation in-person. This activity will help us to learn some of the things to look for.
* Explain to students that we will be discussing 4 ‘types’ of crops, which are pictured in the 4 quadrants of the worksheet. 1 term from the word bank [broccoli-fruiting vegetables (florets), peapod-fruiting vegetables (pods) , lettuce-leafy vegetables, and carrots-root vegetables] applies to each of these kinds of produce, based on how they grow. Ask students to label each of the images using the word bank. Help them along to get the correct answers.
* Then, guide students around the garden to examples of these 4 types of produce. Have the students write down the ways in which we as gardeners can tell when the produce is ready on the corresponding section of the handout.
	+ Root crops (carrots, beets, radishes, potatoes): consider the length of stalks and leaves; look for the top of the root crop popping above the soil
	+ Leafy vegetables (cabbage, lettuce, chard): too much height will make it bitter, as this is the stage of creating seeds; wilting/lack of crispness often signifies past ripeness
	+ Fruiting vegetables (pods: beans, peas)/(florets: cauliflower, broccoli) : rock-hard firmness does not signify ripeness of fruits; feel for the pod.
	+ Overall, ask yourself: Is this something you would take a bite of?

**🐞 Snack:**

* Pass out black beans and tortilla chips. While students are eating, ask them to consider in what ways, if any, black beans and corn (used in the chips) have a role in their diet and if they eat these items often. Explain the role of these foods in the diets of the Aztecs and Mayans.

**Assessment Questions:**

Answer the following:

* What is a solstice?
* What is an equinox?
* How did ancient Mayans know it was time to plant?
* How did ancient Mayans know it was time to harvest?

Answers:

* A solstice is the longest and shortest day of the year.
* An equinox is when there are equal parts of night and day in a day: 12 hrs of daylight & 12 hrs of night.
* The solstice and equinoxes mark the beginning of a new season! The vernal equinox tells us it’s time to plant.
* The autumnal equinox tells us it’s time to harvest.

--------------------------------------------------------------------------------------------------------------