

## **Sustainable Agriculture in North Carolina**

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for the 2021-2022 World View Global Fellows Program

**Overview of Lesson:** This lesson is designed to engage students in an exploration of the history and practice of sustainable agriculture in North Carolina. The focus is on the development of agriculture by Indigenous peoples and the impact the cultural shift that occurred with the influx of European settlers and the onset of heavily targeted cash crop use. Students will primarily focus on the impact of culture on land use and examine how sustainable agriculture as practiced by Indigenous groups could be a solution to declining soil quality and crop yield.

**About the Project:** American Indians lived in the area we now call North Carolina for at least 15,000 years. Archaeologists study the remnants of their communities to learn who these people were and how they lived and prospered for thousands of years. The lesson presented below was developed as part of the 2021-2022 UNC World View Fellows Program, [Exploring Indigenous Cultures: Ancient North Carolinians, Past and Present](#). It is one in a series of lessons that the Fellows created for K-12 schools and community colleges to help students learn about the ancient peoples that lived here and those who represent today's vibrant American Indian populations. Lessons connect past to present day by exploring multiple resources within the [Ancient North Carolinians: A Virtual Museum of North Carolina Archaeology website](#) to examine how communities changed over time and what influenced these changes. Understanding past Indigenous lifeways—their complexity, resiliency, and vitality—allows for a greater appreciation of the contributions American Indians made to the past and continue to make to the present and future of North Carolina.

**Length of Lesson:** 90 minutes

**Suggested Grade Levels:** 9<sup>th</sup>-12<sup>th</sup> grades

**Subjects:** AP Environmental Science, Earth/Environmental Science

**Corresponding National and State of North Carolina Standards:**

[EIN-2](#): When humans use natural resources, they alter natural ecosystems.

EIN-2.C: Describe changes in agricultural practices.

EIN-2.D: Describe agricultural practices that cause environmental change.

EIN-2.E: Describe different methods of irrigation.

EIN-2.F: Describe the benefits and drawbacks of different methods of irrigation.

EIN-2.G: Describe the benefits and drawbacks of different methods of pest control.

[STB-1](#): Humans can mitigate their impact on land and water resources through sustainable use.

STB-1.E: Describe sustainable agricultural and food production practices.

[EEEn.2.2](#): Understand how human influences impact the lithosphere.

EEEn.2.2.1: Explain the consequences of human activities on the lithosphere (such as mining, deforestation, agriculture, overgrazing, urbanization, and land use) past and present.

[EEn.2.4](#): Evaluate how humans use water.

EEn.2.4.1: Evaluate human influences on freshwater availability.

**Essential Questions:**

1. How has sustainable agriculture changed over time in North Carolina?
2. What impact did Columbian contact have on current agricultural practices in North Carolina?

**Lesson Objectives:** At the end of this lesson, students should be able to:

1. Define key vocabulary terms related to agricultural practices
2. Explain how agriculture developed among Indigenous groups in North Carolina
3. Explain various agricultural practices used by Indigenous groups in North Carolina
4. Describe European/colonial/Euro-American agricultural practices
5. Identify important milestones in development between sustainable and industrial/large scale agriculture in North Carolina

**Background information for the educator:**

This lesson focuses specifically on land use in North Carolina, the convergence of European and Indigenous agricultural practices, and the shift from subsistence agriculture to industrial monoculture practices. Students will focus on the Ancient North Carolinians website, specifically Indian Heritage (Woodland, Mississippian, and Historical) and Exhibits: North Carolina’s First Peoples (The Village Farmers) sections.

*Sustainable agriculture* is agriculture that occurs through processes that are designed to maintain soil, water, and vegetation health and viability for continued use. Associated practices include *crop rotation*, *rotational grazing*, the use of *green fertilizer* (manure/animal waste), and the use of *polyculture* practices (growing two or more plants within the same field at the same time, often intermingled). *Subsistence agriculture* is agriculture practiced for the sole purpose of feeding the individual farmer and their family or a small local community. *Monoculture* agriculture is practiced when a single crop is grown over an extensive amount of land repeatedly with little to no rejuvenation of the soil in between growing season. Associated practices include *cash crop cultivation* and *plantation farming*.

The key component this lesson addresses is how Indigenous North Carolinians had extensive knowledge and practice of sustainable agricultural practices, even when growing items such as tobacco. Comparison between Western and Indigenous agricultural practices will be used to highlight the issues facing North Carolina and its agriculture today.

**Student Action:**

- **Preparation** (completed prior to coming to class)
  - Have students view the video [Commercial & Subsistence Agriculture](#)
  - Have students read the article [Regrowing Indigenous Agriculture Could Nourish People, Cultures and Land](#)
- **Beginning** (5-10 minutes)
  - Using a collaborative document (ex., Google Doc, Google Slides, or Jamboard), have

- students review definitions or post their first impressions of the concepts (types of agriculture, etc.)
- Review collective thoughts and information. Take this time to clarify the important definitions shared above.
  - Show the video clip [Hunter-Gatherer Lifeways](#).
  - **Engagement & Exploration** (40-50 minutes)
    - Divide students into groups of 2-3. Assign each group a section of the Ancient North Carolinians website ([Woodland](#), [Mississippian](#), [Historic](#), [The Village Farmers](#)) or the NCPedia articles ([Improvements in Farming Technology and the Burgeoning of “Mega Farms”](#), [Colonial Farming and Food: Famine to Prosperity](#), [Agricultural Economy of Antebellum Life](#), [Agriculture in North Carolina During the Great Depression](#)) .
    - Using a collaborative document, poster paper and markers, or Web 2.0 tools such as Canva, have student groups create an informational poster that includes the following information:
      1. Time period
      2. Group of focus (Indigenous group, European colonist, or descendants of either group. For a list of contemporary American Indian tribes in North Carolina, visit <https://ancientnc.web.unc.edu/indian-heritage/by-modern-tribe/>)
      3. Common agricultural practices
      4. Connection between agriculture and culture
      5. Defining feature of the period’s agriculture
    - Once each group is finished, have students present their information. Select one individual (or do this yourself) to keep/create a timeline of agricultural practices in the state. Share the timeline with the class using an online management system or in hard copy.

**Assessment** (25-30 minutes): Students will develop their own Document Based Question (DBQ) using resources that they have explored during the class period. The DBQ should meet the following criteria:

1. Include an informational passage from at least one reputable source OR include informational passages from three or four reputable sources (i.e. students can create a DBQ based on a single document, or require synthesis of information across multiple documents)
2. Include at least 4 questions: 1 in which the answer is available in the text(s) and 3 which are open-ended
3. Include a scoring guide which indicates sample answers that would receive no, partial, or full credit for each question

**Learning Extensions:**

- Take a field trip (real or virtual) to a sustainable farm near you
- Select one or two well-done student generated DBQs and use them as formative assessments in class

**Explore Further:**

- The film FOOD, INC
- The film THE BIGGEST LITTLE FARM

**Materials:**

- Chart or poster paper
- Markers, colored pencils, crayons
- Projector/Smartboard/Interactive Panel
- Butcher or bulletin board paper for a timeline

**Bibliography:**

Hill, C. G. (2020, 1 Nov). *Regrowing Indigenous Agriculture Could Nourish People, Cultures and the Land*. Retrieved from [https://inthesetimes.com/article/regrow-native-american-agriculture-three-sisters-farming?sm\\_au=iVVVtnLk70fHQ5nDBG4tkK6kRCNsW](https://inthesetimes.com/article/regrow-native-american-agriculture-three-sisters-farming?sm_au=iVVVtnLk70fHQ5nDBG4tkK6kRCNsW)

Mr. Sinn. (2018, 12 Nov). *Subsistence and Commercial Agriculture*. [Video]. Retrieved from <https://youtu.be/xztjTlnCziY>

UNCarchaeology. (2012, 18 Jan). *Hunter-Gatherer Lifeways*. [Video]. Retrieved from [https://youtu.be/JaTAhBC7\\_hE](https://youtu.be/JaTAhBC7_hE)

University of North Carolina at Chapel Hill Research Laboratories of Archaeology. (n.d.). *Ancient North Carolinians: A Virtual Museum of North Carolina Archaeology*. Retrieved from <https://ancientnc.web.unc.edu/>

*This lesson plan was created by Ley King-Bennett of the STEM Early College at NC A&T as part of the 2021-2022 UNC World View Global Fellows Program. For more information about the program, please visit <http://worldview.unc.edu/>*