

SUSTAINABLE FARMING | TEACHER GUIDE



Activity Overview:

In this activity, students will be researching different methods of sustainable farming. This activity follows their lesson about the future of food in a changing climate. Sustainable farming practices consider the negative impact agriculture has on the environment and consciously plant, grow, and harvest crops in a way that sustains the health of the environment. Students will display their research on a poster where they'll illustrate their farming method, summarize the method, and discuss how the farming method supports the environment.

Prep Time: <5 minutes

Activity Duration: 1 hour



STANDARDS ALIGNMENT

Common Core

- *RL.3.1/RI.3.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.*

Next Generation Science Standards

- *3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*

Massachusetts Comprehensive Health

- *5.7.CE.6: Use accurate information when discussing environmental health issues (e.g., littering, deforestation, recycling, climate change, clean water) that impact people's health.*

MATERIALS NEEDED

- *Worksheet*
- *Coloring materials*
- *Writing materials*
- *Student computers*
- *Sustainable farming options*



BACKGROUND INFORMATION

Climate change has brought about significant challenges for agriculture. Extreme weather events, such as droughts, floods, heatwaves, and storms, are becoming more frequent and severe, disrupting growing seasons and damaging crops. Rising temperatures and changing precipitation patterns also impact soil fertility, water availability, and pest and disease dynamics, further exacerbating the risks faced by farmers.

In response to these challenges, farmers are adopting new techniques and technologies to adapt to a changing climate. This includes the development and adoption of drought-resistant crops, precision agriculture practices, and other methods to enhance resilience and sustainability. Genetically modified organisms (GMOs) have emerged as a controversial but potentially transformative tool in addressing the challenges posed by climate change in agriculture.

GMOs are engineered to exhibit traits such as drought tolerance, pest resistance, and increased yields, offering the promise of more resilient crops capable of thriving in changing environmental conditions. While GMOs have the potential to increase agricultural productivity and reduce the reliance on chemical inputs, they also raise concerns about biodiversity, food safety, and the consolidation of corporate control over seeds and genetic resources. Thus, the integration of GMOs into farming practices represents a complex intersection of science, policy, ethics, and economics as society navigates the impacts of climate change on agriculture.



INSTRUCTIONS

1. Explain to students that for this activity, they will be selecting a sustainable farming method. They will choose from a list and will then fill out a poster template with the information they gathered.
2. Hand out worksheets to students and provide them with writing and coloring materials.
3. Give students time (20-30 minutes) to research before they start their poster. Once they've gathered enough information to fill out their worksheet, they can start filling it out.
4. Completed posters can be hung up in the classroom or hallways and later brought home.



SUSTAINABLE FARMING METHODS

- **Organic Farming**
 - Planting, harvesting, and processing crops without synthetic pesticides or fertilizers
- **Agroforestry**
 - Planting trees and shrubs among crops
- **Hydroponics**
 - Growing crops in circulating nutrient rich water; typically in towers or trays without soil
- **Aquaponics**
 - Growing crops in a soil-less fish tank populated with fish. The fish provide nutrient rich water while the crops provide fish with nutrients
- **Permaculture**
 - Planting crops based on and amongst the environment. This method of agriculture produces no waste when done correctly
- **Cover Cropping**
 - Planting a variety of crops that cover the soil and prevent erosion and weed growth
- **Regenerative Agriculture**
 - Agriculture that focuses on rebuilding the soil and repopulating soil biodiversity
- **Polyculture**
 - Planting a variety of crops that grow well together and typically benefit from one another
- **Crop Rotation**
 - Planting different crops in the same soil in different seasons to restore soil health and improve soil nutrients
- **Biodynamic farming**
 - Planting crops to optimize soil health, rotating crops, cover cropping, and using animals to maintain and nurture the land



THE FUTURE OF FOOD



SUSTAINABLE FARMING METHOD

DRAW YOUR FARMING METHOD

DESCRIBE YOUR FARMING METHOD

ENVIRONMENTAL BENEFITS

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