

## Sustainable Communities, You be the Judge

### Objectives

- Students will be able to “judge” for themselves if these communities are sustainable locally or globally.

**Skill Level:** Middle school or high school

**Class time:** 60 minutes

### Materials

- Case Studies on Sustainable Communities
- Scrap paper for notes
- White Board, Chalk Board or Paper Tablets and Markers for sharing viewpoints

### Next Generation Science Standards

**Disciplinary Core Idea:**

ESS3.C: Human Impacts on Earth Systems

**Performance Expectations:**

MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems

**Practices**

- Asking questions / defining problems
- Developing / using models
- Planning / carrying out investigations
- Analyzing / interpreting data
- Math / computational thinking
- Constructing explanations / design solutions
- Engaging in argument from evidence
- Obtaining / evaluate / communicate

**Crosscutting Concepts**

- Patterns
- Cause and effect: Mechanism / explanation
- Scale, proportion, and quantity
- Systems and system models
- Energy / matter: Flows, cycles, conservation
- Structure and function
- Stability and change

## Background Information

Many conversations are taking place on what is sustainable and how renewable resources are included in the ideas of sustainability. Webster defines sustainability as “capable of being [sustained](#), or of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged (*sustainable* techniques or *sustainable* agriculture) or, of or relating to a lifestyle involving the use of sustainable methods (*sustainable* society) ” and Wikipedia as “Sustainability is the capacity to endure. In [ecology](#) the word describes how biological systems remain [diverse](#) and productive over time. Long-lived and healthy [wetlands](#) and [forests](#) are examples of sustainable biological systems. For humans, sustainability is the potential for long-term maintenance of well being, which has environmental, economic, and social dimensions.”

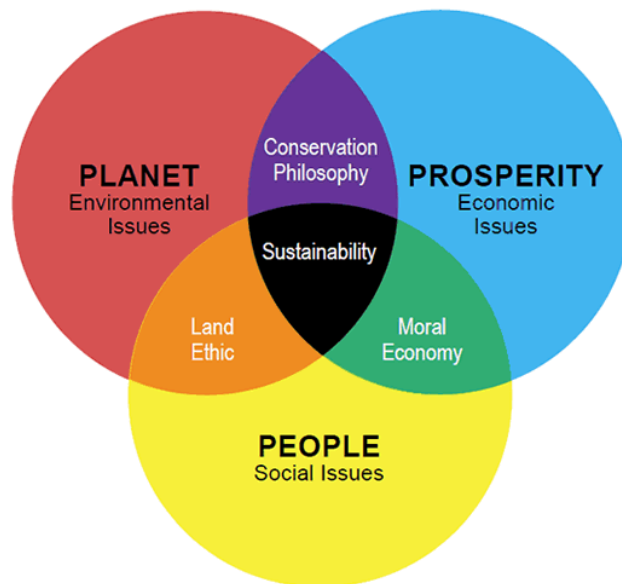


Figure 1. This diagram reflects the idea of the trifecta. [Reference](#)

United States Department of Agriculture (USDA) acknowledges that there are countless definitions, however they promote the idea of one concept:

**Sustainability – the capacity to ENDURE**

Sustainable systems are able to meet the needs of the present without compromising the ability of future generations to meet their own needs. Methods, systems and materials that don’t deplete resources or harm natural cycles – responsible stewardship

Another way of viewing sustainability is to think about it in three distinct parts – social, economic and environmental or the sustainability trifecta.

### Sustainability Trifecta for Bioenergy

- Social - Enhances the quality of life for farmers and society as a whole
- Economic – cost competitive, fair labor practices & sufficient income for farmers
- Environmental – respects natural processes & protects ecosystem functions

There seems to be some conscience of what sustainability means, but there is no one right answer. There also seems to be a realistic view that not only includes the environment, but economics and human visions as well. What these add are additional parts to the equation. For example a particular practice may be better for the environment, but how much does it cost compared to a different practice that is not as environmentally friendly? Or another practice may be better for the environment, but displaces people from their homes or requires people to stop doing a particular practice with no direct alternative for income. For example the practice of agroforestry is a complicated one with its benefits and negatives. Agroforestry is the practice of growing ground crops within tree plantations. Benefits can include:

- Diversified market products
- Potential pest control
- Enhanced pollination
- Effective erosion control

But agroforestry also faces challenges:

- Slow return on crop – trees take longer to grow than plants
- Complex management issues

(See resources list for more content background).

These case studies will challenge the definition of sustainability. Students should be able to answer the following: How do these definitions fit with your own personal definitions?

### Engage

- What is your idea of sustainability?
- Who might agree with your definition?
- Name another sustainable practice and its pros and cons.

## Explore

### Experiment Questions:

- What practices in your case are sustainable?
- What is the evidence to support your claim?
- What would a sustainable community look like to you?

### Procedure:

1. Break students into pairs or groups of four.
2. Show the students different types of sustainable practices. [Dancing Rabbit](#) is a commune that believes in using 10% of the resources you currently use. Most people would consider this a drastic lifestyle change that they cannot picture themselves doing. On the other end of the spectrum, some communities make small changes to become more sustainable. [Fox Island, Maine](#) turned to wind turbines to decrease their energy costs. These are great examples to show the class and gives them some direction before embarking on their on research.
3. Explain that as they are shown the case studies that they are to identify the practices that they feel are sustainable. Have your students record these in their groups.
4. Ask the students to discuss this among their group and be prepared to share their answers with the class. (You can ask them to support their claims of sustainable practices directly from the article).
5. When the groups are ready, have each group research a sustainable community and share one of their practices and discuss as a whole group. This can be done verbally or using a visual such as reporting on the board, power pint slides, large paper, etc... next, move on a different group. Do this for each group and continue till the case study has thoroughly been reviewed.
6. Next have the students read the two other sustainable practices case studies and discuss if they agree or disagree with what is presented. Report out.
7. For the final activity, have each group develop a mock sustainable community to share with the class. These sample case studies developed by the students should reflect some aspect of the bioenergy materials being covered.
8. When these are completed, have the students trade case studies with each other for comparison.

## Explain

- What practices are truly sustainable?
- Where else can they be applied?

### Elaborate

- Have students look into their own communities for sustainable practices.
- Interview a local business to see how sustainability fits into their framework.
- Investigate the school lunch program by finding out where the food that is served is coming from and conduct a life cycle analysis (LCA).
- Review local and national newspapers for stories covering sustainable practices and share these with the club. Use as discussion topics.

## Resources

### Resources Used:

- [Agriculture Energy Curriculum](#)

### Additional Resources:

- [What is a Sustainable Community?](#)
- [Indicators of Sustainability](#)
- [Environmental Protection Agency](#)
- [Sustainable Communities](#)