## CONSERVATION STATION

# Is Our Community Sustainable?

## OBJECTIVES

Students will

- **describe** a sustainable community.
- **identify** different types of sustainability and provide examples for each.
- **create** a sustainability index by evaluating the most important factors of sustainability.
- **evaluate** their community and identify where improvements could be made by applying the sustainability index they developed.

## GRADE RANGE

6–8

## DURATION

Two class sessions of approximately 45 minutes each

## OVERVIEW

With this set of resources, students will determine what a sustainable community looks like by examining examples of human, economic, and environmental sustainability. Students will develop an index to decide the most important factors that identify a sustainable community. Using this index, students will make observations of their community, suggest improvements, identify challenges, and determine the sustainable development goals that their improvements will need to meet.

## BACKGROUND[1]

Sustainability is about meeting the needs of today while ensuring that future generations can meet their own needs. According to the United Nations, water, food, and energy form a nexus at the heart of sustainable development. Most of the world's freshwater is used for industrial agriculture, and water is used to produce most forms of energy. The amount of food, water, and energy must increase drastically to meet the demand of the world's growing population. To withstand current and future pressures, governments must ensure integrated and sustainable management of water, food, and energy to balance the needs of people, nature, and the economy.

## MATERIALS

ALL SESSIONS

- Computer with ability to project—one for educator

SESSION 1

- **Connect-Extend-Challenge**—one per student
- Digital Lesson Bundle Video—Sustainable Communities: Engaging in Energy Solutions
- Three Poster board or butcher paper sections around the room

SESSION 2:

- **Summary Placemat Template**
- Large Poster paper—one per group
- Markers—one per group
- **Foldable Template**
- Plain computer paper—one per student
- Scissors—one per student
- Rulers—one per student
- Colored pencils—one per group

## USING THIS GUIDE

The goal of this guide is to give educators a complete set of resources for facilitating lessons on environmental quality. It provides slide-by-slide instructions to ensure educators are prepared to explain, discuss, and facilitate the hands-on content in the presentation. The presentation is designed to cover two class sessions, but it can be flexible depending on the students' needs and the time available. However, sessions should be presented in order.

The accompanying presentation was created with PowerPoint so that it can be used in a variety of classrooms. If you are using a laptop with a projector, simply progress through the PowerPoint by clicking to advance. All of the interactive aspects of the presentation are set to occur on click. This includes images, text boxes, and links which will appear in your web browser. If you are using an interactive whiteboard, tap each slide with your finger or stylus to activate the interactive aspects of the presentation. Notes for each slide provide information on how to proceed.

## PROCEDURE
# SESSION 1 (Slides 1–12)

**Overview:** Students will learn that there are environmental, social, and economic factors that make a community sustainable. They will assess and prioritize factors of a sustainable community and develop a sustainability index to evaluate their own community in session two.

### Slide 3

- Pose the following question: What does the phrase "sustainable community" mean? Ask students to think to themselves for about a minute and write down their thoughts.

- Ask students to turn to the person next to them (groups of 2–3) and share their answer with each other.

- Prompt students to report out on "behalf" of their group. The summary could include differences in thought process and whether the group agreed or not.

### Slide 4

- Inform students that they will watch a short video *Sustainable Communities: Engaging in Energy Solutions* that provides real world examples of cities that are improving their sustainability.

- Distribute the Connect Extend Challenge handout to each student. Review the instructions with the class. Explain that after the video, they will reflect on what they saw by <u>connecting</u> to information from the video to things they already knew, <u>extending</u> their views or understanding to a new idea or topic, and <u>challenging</u> an assumption or thought they already had about the topic.

- Click the play button to start the video.

- After watching the video, provide students with time to complete the reflection. Invite students to then quietly move to the three connect, extend, challenge stations placed around the room. Students will have a few minutes to write their ideas and then move to the next station. When complete, share with the class the ideas presented.

- Ask students if they would like to add or change anything to the definition they constructed of a sustainable community. Return to slide one and make any necessary additions or modifications.

### Slides 5–8

- As you display the photo on each slide, ask students to answer the question: Is this community sustainable? As they make their claim, have them provide evidence from the photo and reasoning for how it relates to their constructed definition of sustainable community.

### Slide 9

- Explain the three types of sustainability to students and review the examples of each.

### Slide 10

- Divide students into small groups of three to four. Challenge students to brainstorm 15-20 factors that would make a community sustainable. Encourage students to think on a large scale, helping many people in the community rather than just a few. Refer students to the examples you shared for each type of sustainability if they need guidance getting started. Provide students approximately ten minutes to complete this activity by clicking the timer on the slide.

**Slide 11**

- When small groups finish their lists, ask a representative from each group to share their factors. If other groups have the same factor written on their list, have them circle it. With each factor shared, discuss which type of sustainability it represents and write it on the board in the appropriate column. Some factors may contribute to more than one type of sustainability and be listed under more than one heading. For example, planting community gardens could be a social factor because they improve quality of life but also an environmental factor because they reduce emissions from automobiles.

**Slide 12**

- To close, explain that students will need to create an index to use that measures the sustainability of a community for the next lesson.

- Ask students to review the class list and independently rank the top ten factors most vital in determining whether a community is sustainable.

- Based on all the factors listed on the board, conduct a class vote to determine the ten factors that will be their sustainability index.

# SESSION 2 (Slides 14–21)

**Overview:** Students will use their sustainability index from the last session to evaluate if their community is sustainable. Each group will assess their community using one factor from their index. Groups will make observations, suggest improvements, identify challenges, and determine which United Nation's sustainable development goal(s) their improvements will meet.

### Slide 14

- Place students in groups of four and provide each group with a placemat-style chart paper to share. Students will build on each other's ideas to summarize what they learned from yesterday's lesson.

- Have each member select a different section of the chart paper. Share the following prompt with the students: How would you define a sustainable community? Ask students to work independently and write three to four key ideas in their section.

- Have members of the group take turns sharing their thoughts. To build student relationships, explain that the first student to share should be the one who spent the most time outside within the past week. As each group member shares, students can add notes to their section on the paper, like circling common words or adding a star next to similar ideas.

- Finally, have the group synthesize common ideas into a summary, then write their summary in the center of their placemat. Invite one or two groups to share their summary with the class.

### Slides 15–19

- Organize students into nine groups and distribute one foldable template to each student. Assign the group one of the sustainability index factors. One factor will be left unassigned.

- Using the Foldable Template student resource as a guide, model for students how to construct their foldable by showing them how to fold, where to cut (dotted line), where to write the labels, and where to add their answers.

### Slide 20

- Use the remaining sustainability index factor not assigned to demonstrate how to complete the foldable. See the example below.

> **Sustainability Index Factor = Mass Transit**
>
> **Observations:** no subway station, few housing units near commuter train, centralized bus transfer station
>
> **Improvements:** add subway route, build higher density homes near train station, build businesses around mass transit stations
>
> **Challenges:** lack of funding, existing infrastructure built for cars, change zoning laws
>
> **United Nations SDGs:** industry, innovation, infrastructure; reduced inequalities; sustainable cities & communities; climate action

### Slide 21

- Each group should share their foldable with the class, explaining their thought process and answering any questions other groups may have.

## CONTENT AREA STANDARDS

### STEM

Next Generation Science Standards (NGSS):

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

- MS-ESS3-4: Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

- MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

### ELA

Common Core State Standards (CCSS):

- SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

### Science and Engineering Practices:

- Asking questions and defining problems

- Constructing explanations and designing solutions

### Framework for Social Studies State Standards

- D2.Geo.4.6-8 Explain how cultural patterns and economic decisions influence environments and the daily lives of people in both nearby and distant places.

- D2.Geo.12.6-8 Explain how global changes in population distribution patterns affect changes in land use in particular places.

- D2.Geo.7.9-8 Evaluate the influences of long-term human-induced environmental change on spatial patterns of conflict and cooperation.

**Directions:**

- In the first column, **connect** things you see to your existing knowledge, questions, or ideas.
- In the middle column, **extend** your thinking by considering new ideas or things that you learned.
- In the final column, **challenge** your learning by considering what confused you or made you think differently about the topic.

| CONNECT<br>How does this connect to what you already know? | EXTEND<br>What ideas extended your thinking? | CHALLENGE<br>What challenged your thinking or was confusing? |
|---|---|---|
|  |  |  |

Partner 1 Response

Partner 2 Response

Partner 4 Response

Group Summary

Partner 3 Response

Sustainability Index Factor =

What observations can we make about this factor in our community?

What can we do to improve this factor in our community?

What challenges could we encounter implementing these improvements?

Which UN sustainability development goal(s) can be met with these improvements?