IN SEARCH OF SUSTAINABLE LIFE

EARTH
m a t t e r s
Studies For Our Global Future

introduction

We all want to live in a community that contains the resources needed to survive, is safe, clean, and provides adequate public services such as schools and a fire department. But it would be shortsighted to consider only the needs of community members alive today. The human population is constantly expanding – roughly 84 million people join our ranks every year. How can we ensure future generations continue to benefit from the resources we enjoy today? How do we know if a community is **sustainable**?

More often than not, the progress of cities, states, and countries is measured with an economic index. The **gross domestic product (GDP)** measures the value of all goods and services produced in a certain place. And while GDP is a good indicator of economic activity, it does not account for many social and environmental factors that influence a community's sustainability. The World Resources Institute points out that a "country could sell off its timber and minerals, erode its soils, pollute its aquifers, deplete its fisheries and the national accounts would treat all the proceeds as current income."[1] But suppose this happened. How would future generations survive and thrive without timber, nutrient soil, and clean water?

Economic activity does not tell the whole story. There are additional factors within a community that point to sustainability but are not measured in economic terms.

Vocabulary: gross domestic product (GDP), sustainable

materials

Part 1
- Community Photos (provided)

Part 2
- Student Worksheet

Part 1: A Sustainability Index
procedure

1. Write "Sustainable Community" on the board and ask students to quietly consider what the term means. You may need to have them take each word independently first. If your students are not familiar with the concept of sustainability, have them first define the root "sustain."

2. Using student input, create a working definition of "sustainable" on the board for easy reference throughout the lesson.

3. One by one, show the Community Photos found at the end of the lesson and for each, ask students to answer the question: Is this community sustainable? Why or why not?

   Note: Students' answers at this point will be guesses; they will be learning what makes a sustainable community throughout the remainder of the lesson.

4. In small groups, challenge students to brainstorm what factors are found within a community that makes it sustainable. Encourage students to think in a broad sense, considering more than what would make their own life sustainable, and to be specific. You may want to provide an example to get them started such as having adequate green space, access to nutritious food, or a strong recycling program. At this point, focus on quantity with the expectation that each group's list may include 15-20 factors.

5. Come together as a class and allow each group to share their factors. There will surely be repeats but write each unique idea on the board.

6. Ask the students to look for patterns or groupings within the large list. Do any factors seem to go together? Do some factors naturally relate to other factors? Are there any outliers? At this point, don't do any formal grouping but rather keep it as a discussion.

7. Depending on the list, some students might conclude that there are different types of sustainability. Some however, might not. If students only list factors relating to environmental sustainability, go ahead and introduce the following idea – "*sustainability can relate to different things, often falling into three categories: human/ social, environmental, or economic.*" Give students a chance to add factors that fall into the newly introduced categories to the big class list.

8. In their small groups, students review each factor on the list and determine into which of the three categories of sustainability it fits. Discuss one factor as a class to ensure students understand the task before they return to their group to categorize the remaining factors. Keep in mind that factors can be considered relevant to more than one type of sustainability. For instance, bike lanes could be a social factor because they improve quality of life but also an environmental factor because they reduce emissions from automobiles.

Three Major Types of Sustainability	
Type	**Examples of factors**
Human/Social – pertaining to the health and happiness of individuals and the society	Access to education, health care, and nutritious food; citizen involvement, community safety/low crime
Environmental – pertaining to the natural environment and resources on which all living things depend	Accessible green spaces; public transportation; clean air/water/land
Economic – pertaining to monetary capital	Healthy businesses; revenue for the city; job opportunities

9. Now it's time to produce a usable index that measures the sustainability of a community. Based on the factors listed on the board, conduct a vote to determine which 10 factors the class considers most vital in determining whether or not a community is sustainable. These factors will make up the class Sustainability Index. You may want to give students time to consider the large list independently and perhaps do their own ranking of top 10 factors before the class vote.

   Possible voting method: List each factor on a piece of butcher paper. Give each student 3-5 stickers and have them place one under each of their top factors. The 10 factors with the most stickers will be used for the remainder of the activity.

Sample Sustainability Index	
Factor	**Type of Sustainability**
Green space	Environmental
Waste management	Social and Environmental
Water conservation	Environmental
Access to fresh and nutritious food	Social
Quality health care	Social
Citizen involvement	Economic and Social
Quality education	Social
Low pollution	Environmental
Small business support	Economic
Mass transit options	Environmental and Social

Part 2: Sustainability in my Community

procedure

1. The class Sustainability Index is complete but now students must determine possible *measurable* indicators for each of the 10 factors on the index.

Review the following definitions with the class:

Factor: An item or circumstance that contributes to an outcome. In this case, the item contributes to a sustainable community.

Indicator: A measurement or gauge of the level of something. In this case, a way to measure or gauge the sustainability index factor.

Example:
Sustainability Index Factor – Strong waste management system
Indicator – The percentage of residents who consistently recycle their waste

2. Have students return to their small groups to brainstorm possible measurable indicators for each factor. You may want to provide an example, perhaps using a factor that didn't make it onto the final index.

Sample Sustainability Index with Possible Indicators		
Factor	**Type of Sustainability**	**Possible Indicator**
Green space	Environmental	Average number of trees per block
Waste management	Social and Environmental	Percentage of community that recycles
Water conservation	Environmental	Number of households with low-flow showers/toilets
Access to fresh and nutritious food	Social	Number of fresh produce stands
Quality health care	Social	Number of clinics in the area
Citizen involvement	Economic and Social	Percentage of voters in last election
Quality education	Social	Number of high school graduates
Low pollution	Environmental	Average pieces of trash per block
Small business support	Economic	Number of individually owned businesses vs. national chains
Mass transit options	Environmental and Social	Number of public bus lines

3. Assign, or have each group select, one factor/indicator pair for which they will ultimately invent methods for collecting relevant data.

4. Distribute the Student Worksheet, one to each group. Clarify that each method should be a way students could personally collect original data. (Examples of collecting original data are: follow the recycling truck around on pick-up day and count how many stops it makes and how many houses it skips. Or stand outside a grocery store or other public place and survey people on their recycling habits. Non-original data collection is going onto the city's website and looking up what percentage of residents recycle.)

5. When finished, have groups pair up and discuss their factor/indicator pairs and the data collection methods they created. Each group should first explain their methods and then field questions from the other group. Discussion can also include the limitations of these methods, how easy each methodology would be to implement, which method they would implement in the real-world, etc.

Sample Sustainability Index with Possible Indicators and Methods for Data Collection			
Factor	**Type of Sustainability**	**Possible Indicator**	**Possible Method of Data Collection**
Green space	Environmental	Average number of trees per block	Count the number of trees on 20 blocks and calculate the average.
Waste management	Social and Environmental	Percentage of community that recycles	Follow the recycling truck on pick-up day and count how many stops it makes and how many houses it skips. Calculate the percentage of stops out of the total number of houses.
Water conservation	Environmental	Number of households with low-flow showers/toilets	Survey people outside a local hardware store.
Access to fresh and nutritious food	Social	Number of fresh produce stands	Find how many produce vendors are registered with your city.
Quality health care	Social	Number of clinics in the area	Look up the number of clinics listed online.
Citizen involvement	Economic and Social	Percentage of voters in last election	Survey 50 people and ask if they voted in the last election. Calculate the percentage from the total.
Quality education	Social	Number of high school graduates	Watch video of past high school graduation ceremonies and count the number of graduates.
Low pollution	Environmental	Average pieces of trash per block	Count the number of litter pieces on 20 blocks and calculate the average.
Small business support	Economic	Number of locally owned businesses vs. national chains	Within a given business district, count the number of locally owned businesses and compare to the number of chains.
Mass transit options	Environmental and Social	Number of public bus lines	Using a transit map, count the bus lines.

discussion questions

1. Do you agree or disagree with categorizing sustainability into the three groups: social, environmental, and economic? Explain.

   Answers will vary. While some students may agree, others might think that having just three categories is limiting. If that's the case, ask what categories they would use and why they would be a better fit.

2. Consider the community using the class Sustainability Index. Would the Index still be useful in 20 years if the population of the community grew significantly?

   The Index itself would most likely still be useful and might even be more important. For example, if having mass transit options was a priority in the current community, it might be even more of a priority when there are more people. Some

students might note, however, that the methods for collecting data on some of the indicators could become more difficult given a larger population.

3. How would a larger population impact a community's ability to be sustainable? Would the impact be greater on any one of the three categories?

    Some might argue that a larger community would have a more difficult time being sustainable – more people must agree on the sustainability factors and more people must comply. Others might say that more people in a community could mean more people thinking creatively about solutions and more people helping out with various sustainability tasks.

assessment

Evaluate student participation in the creation of the Index and class discussion in Part 1. Review the Student Worksheets and monitor small group discussion in Part 2.

follow-up activities

1. Have students apply their Sustainability Index to your community. Students should conduct focused research on their individual factor/indicator and report their findings back to the class so everyone gets a broad picture of your community.

    For their factor/indicator, have students determine a source where they could find relevant information and then track it down. (E.g. They could contact the city's department of public works and ask for statistics on recycling participation.) Once students know statistics of their indicator, have them consider questions such as:

    - How does my community rank in terms of this indicator, and thus in terms of this sustainability factor? If it's poorly, how could this be improved?
    - How does my community compare to neighboring communities in terms of this factor?
    - Has this factor improved or gotten worse in recent years?

2. Students outline a proposal for dealing with one of the poorly ranked factors and send it to selected local leaders and government officials. They might also want to send the full Sustainability Index so that city officials can determine what students care about in their community.

3. Students review the United Nations Sustainable Development Goals (SDGs) and write a one page paper comparing their Sustainability Index with the SDGs. How are the targets and indicators similar or dissimilar? For more information on the SDGs, students can explore the UN's SDG website.

Name: _____ **Date:** _____

Factor – An item or circumstance that contributes to an outcome. In this case, the item that contributes to a sustainable community.
Indicator – A measurement or gauge of the level of something. In this case, a way to measure or gauge the sustainability index factor.

1) What factor will you be focusing on? What type of sustainability does it fall under? What indictor will be used to measure your factor?

2) Consider your sustainability factor and invent two methods for collecting information about its indicator. Complete the chart below.

Title *Create a unique title for each model*	**Method 1:**	**Method 2:**
Description *Write 3-5 sentences describing the method. You may also use diagrams or flowcharts to help you.*		
Feasibility *How realistic is this model? Are there any limitations or drawbacks?*		

"1st Street NE cycletrack, Washington DC" by BeyondDC, CC BY-NC-ND 2.0

"Whitefield Park" by Mikey, CC BY 2.0

Photo from "[Healthy Harbor Announces Campaign for New Canton Water Wheel](#)" from the Waterfront Partnership of Baltimore

Photo from "[Mundelein Farmers Market Exceeding Expectations of Vendors and Residents](#)" from the Village of Mundelein

"Street Crossing Guard on Egan Drive, Juneau, Alaska" by Gillfoto, CC BY-SA 4.0