

MODULE TWO:	CREATING SUSTAINABLE COMMUNITIES
Chapter 3:	Indicators
Essential Question:	What kind of future will we invent?
Guiding Questions:	What is an indicator? What do different indicators measure? How do we know how well we are doing?
Duration:	5-7 days

Objectives

- Students will be able to explain and describe indicators and their roles as measurement tools. Students will be introduced to various indicators of well-being and progress, both for nations and for local communities. Students will formulate indicators for their own sustainable communities.
- Students will be introduced to the idea that progress and success are multi-dimensional, and that the achievement of success and progress takes place in a wide array of social, ecological and economic arenas.

Methods Used

- Brainstorming, Creating a List, Discussion of Key Questions, Journal Writing, Reading and Group/Whole Class, Survey, Worksheet

New Vocabulary

- Ecological Footprint, Gross Domestic Product (GDP), Genuine Progress Indicator (GPI), Human Development Index (HDI), Index of Sustainable Economic Welfare, Indicator, Per capita, Progress, Quality of Life

Description

- As a diagnostic pre-test, students complete a survey to determine indicators that they presently use to determine progress and success. Using the [“Indicators of Progress”](#) Mini-Lesson (p. 94), students define progress and success, and are introduced to tools to measure progress and well-being.

Assessment

- Diagnostic — Survey
- Participation in discussions
- Student responses to questions and worksheet
- Student-created sustainable community indicators
- Journal Entries (you can use Journal Reflection Rubric to assess this and all other journal entries)

Materials/Resources

- [“Indicators of Progress”](#) (p. 94) — Teacher Resource.
- [“Some Possible Answers to Student Indicators Packet”](#) (p. 101) — Teacher Resource.
- [“Vision Indicators Worksheet”](#) (p. 104) — Student Packet.
- [“Indicators Packet”](#) (p. 107) — Student Handout.
- Redefining Progress <http://www.rprogress.org>.
- Maureen Hart. *Sustainable Measures: Indicators of Sustainability*. <http://www.sustainablemeasures.com>.
- Wackernagel, Mathis and William Rees. *Our Ecological Footprint: Reducing Human Impact on the Earth*. Gabriola Island, B.C.: New Society Publishers, 1996.

Learning Opportunities

- See Sample Lesson Outline [“Indicators of Progress”](#) (p. 94).
- Students then address the question “What is success for my community?” by focusing on their vision for their community, and drafting indicators that will help them know how they’re doing with respect to achieving that vision.
- Students research and discuss different kinds of indicators and what they measure.

Adaptations for Different Learners

- Students design a chart that is a summary of the class list of personal indicators of success. Interview several teachers to determine their list of personal indicators of success. Create a chart of the indicators of success for communities.

Extensions

- Using Appendix A: “A Closer Look at the Ecological Footprint,” Lesson Outline, teachers and students can explore their own ecological footprints and assess the footprints of every nation.
- [“The Economy is Ecologically Blind”](#) Overhead/Handout (p. 124) from *Ecological Footprint* overheads; www.newsociety.com; included in packet.
- [“Butterflies Aren’t Free”](#) (p. 125) — Student Handout.
- [“There’s No Accounting for Oranges and Apples”](#) (p. 127) — Student Handout.

Teacher Resource
Mini-Lesson

Indicators of Progress

Adapted from: Hart, Maureen. *Sustainable Measures: Indicators of Sustainability*.
<http://www.sustainablemeasures.com>; <http://www.rprogress.org>.

Objective

- To explore indicators of economic, ecological and social well-being, progress and success.

Materials

- [“Indicators Packet”](#) (p. 107) — included in unit
- Black board, overhead or large paper and marker
- Index Cards

Learning Opportunities

- Write the following question on the board or large paper: “What is success for me and for my community?”
- Tell students that they are going to explore this question, and, in order to do that, they will have to be able to detail some aspects of success, and then measure how well they, their communities, and their society are realizing these pictures of success.
- Ask students to think about their lives. Have them generate three answers to the question, “How do you know you are doing well?” List their answers on the board or large paper. Answers may include personal, social and economic aspects of students’ lives (I feel healthy, I have a supportive family, I have a part-time job, I have many close friends, etc.) Ask students how they know that these things are true (I wake up without pain, my family listens to me, I laugh a lot with my friends).
- Explain that they have generated a list of indicators of their personal success.
- Present them with the following definitions of an indicator:
 - “An indicator is something that helps you understand where you are, which way you are going and how far you are from where you want to be.”
 - “An indicator is a way to measure the condition of a system.”
- Tell students: Measuring isn’t new. We all measure all the time. In fact, we start doing it at an early age — who got the biggest piece of cake, who can run the fastest, who caught the most fish — the examples are endless. We all set goals and use indicators to measure our progress towards our goals.

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Example:

Goal: To stay healthy

Indicators: your temperature, your weight, your pulse, the sugar level in your blood (especially important for diabetics), your T-cell count in your blood (important for those who have a disease like AIDS that suppresses your immune system). You can ask students to take their pulses and breath rates, if you wish, and report them out to the class.

- Ask students about some specific goals they have in life. As a class, try to think of appropriate indicators to help them see whether or not they are moving to achieve those goals. (If students want a good relationship with their family, an indicator could be the number of times they interact with other over the course of a day; if students want to graduate, an indicator would be how many course credits they have accumulated, etc.)

Record this information on the board in a two column chart, and on the Indicator Handout.

- Ask students why it is important that the indicators accurately measure progress towards the goal you identified. (Answer: otherwise, you are measuring apples when you really want oranges). Ask if they can think of any examples of badly-chosen indicators that don't really measure progress towards the desired goal. Write the examples of goals and indicators on the board, and see if anyone can come up with better indicators to measure progress towards the goal. Examples: Using IQ tests to measure how well schools are doing: how difficult it can be sometimes to know how happy someone is or how well a relationship is going (hard to find good indicators, sometimes).
- Tell students that we need to become aware of what we measure. Sometimes we measure what is important to us, but sometimes measuring things can help us realize how important they are to us. Examples:
 - A new law was passed requiring U.S. companies to report the industrial chemicals they put into the atmosphere. As a result, emissions decreased by 40% over three years, even without new laws making them illegal. Companies began to think about what they were doing, and became concerned with the public's opinion of their activities.
 - When Dutch houses were built with the electric meter in the front hall, where it could be seen, electricity in the houses went down by one-third, even though there was no change in the price of electricity. When people could measure their electricity use, they were inspired to think of ways to use less electricity. (Source: Donella Meadows, *Indicators and Information Systems for Sustainable Development*, Sustainability Institute, 1998.)
- Tell students that you are going to ask them some questions about things that they might measure. Ask them to note to themselves whether they measure what you mention. Tell

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them that you don't want them to give you the measurement, you just want to know if they know the measurement. Give them an example: “If I ask you if you know how much you weigh, I am not going to ask you to tell everyone your weight. I only want to know if you know how much you weigh. I am also not interested in precision. This isn't a quiz. You don't have to know your weight to the gram or what it is after a big meal.”

Example #1 — Ask students the following questions:

1) *How many of you know . . . :*

- how many TVs are in your house?
- how much those TVs cost?
- how many hours you watch TV this week?
- where you bought those TVs?
- where those TVs were actually made?
- what materials make a TV?
- where the materials come from to make a TV?
- where old/discarded TVs goes when you are finished with them?

2) *How many of you know . . . :*

- how much a candy bar typically costs?
- how many candy bars you have eaten this week?
- where you bought those candy bars?
- the people who worked at the stores where they bought the candy bars?
- how much those people get paid and whether they have health benefits with their job?
- what you do with the wrapper when you're finished?
- where the wrapper goes when you've disposed of it?

3) *How many of you know . . . :*

- where those stores get their candy bars and how many miles the pre made candy bars were transported to the store? Where were the candy bars themselves made? What was in the candy bars? Did the candy bar ingredients have to be transported to where the candy bar was made?
- who made that candy bar? How much do they get paid? What machinery do they have to use to make that candy bar? Do they all have health benefits with their job?
- where they threw the wrapper of the candy bar once they were finished eating it? What made that wrapper? Who made that wrapper?

And all that went into you eating a candy bar! Multiply that by how many you ate this week.

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We tend to pay attention to the monetary measures of what we do without thinking about the social or ecological consequences of what we do. The monetary measures are often only partial measurements of costs because some costs have been externalized (are external to the market transaction of buying a candy bar). This is one reason why many people who care about the environment want the costs of goods to reflect their true costs to society and the planet.

You can do this with any item. If you buy something that is less expensive because it was made by the forced labor of children in sweatshops in less developed countries, are you responsible for their poor quality of life? If you buy food that was grown in another country where DDT and other pesticides are still allowed, are you responsible for the effects of these chemicals on migrating birds or on the health of the families of farm workers?

Example #2 — Ask the question: “Let’s take shampoo. Does everyone here use shampoo?”

4) *How many of you know . . . :*

- how often you use shampoo to wash your hair?
- how much one bottle of shampoo costs?

Okay, so you see we have a way to measure our hygiene and to measure our expenses.

5) *How many people know . . . :*

- how long it takes to use one bottle of shampoo?
- what materials/ingredients are in shampoo?
- what chemicals are in the shampoo and what processes factories use to make it?
- where those factories are?
- how employees at these factories are treated?
- how the shampoo was packaged — including the bottle? What materials went in to the packaging? Who made that packaging? Where does that packaging go once you are done with it?

Most traditional indicators are based on dollars — the amount of money that we spend on something. However, what is most important is what we get for the money we spend.

Teacher Resource Mini-Lesson

- Explain to students that they will be exploring some different types of indicators.
 - How many of you believe that in order for you to get what you want in your life, you need economic well-being?
 - How do we measure economic well-being?
 - Explain that indicators exist that attempt to measure how well countries are doing. In the past, the traditional measure has been the Gross Domestic Product (GDP). GDP measures the total output of final goods and services produced in the cash economy in a country within a year. Traditionally, a high GDP has been considered an indicator of progress — but does everything that the GDP measures contribute to a successful society?
 - Brainstorm the kinds of goods and services that are included in the GDP accounting. Record these answers on the board.
 - Tell students that the following are also goods and services that increase the GDP:
 - *The oil spill of the Exxon Valdez in Alaska in 1989 increased the GDP of that region in Alaska. The more spillage — the more clean-up crews and machinery — the better for the GDP.*
 - *The 1995 O.J. Simpson trial produced in revenues (publicity, TV coverage, etc.) \$200 million dollars and was included in the GDP. Two hundred million dollars is more than the total GDP of the country of Grenada. The longer the trial — the higher the revenues — the better for the GDP.*
 - *Revenues from crime protection account for \$65 billion dollars a year, of which \$100 million are only from “The Club,” an anti-theft car security device. The more crime — the more crime protection — the better for the GDP.*
 - Question: Can you think of other “not so great” activities that are “great” for the GDP? (Answers can include divorce — generates lawyer’s fees; disease — generates hospital and doctor’s fees.) List on board or large paper.
 - Question: Can you think of any activities that you value or that are good for society that don’t involve any money changing hands? (Answers can include home gardening, free child care from a relative, learning for free from a neighbor, volunteering at a neighborhood non-profit, etc. Refer to ecosystem services, like cleaning the air and preventing floods — all these useful activities that nature does for free that are included in the GDP.) Tell students that none of these contributors to the success of a society is counted in the GDP. Write answers on the board or large paper.

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- Students should be able to see that the GDP isn’t a very good indicator of success or well-being, but instead is an indicator of the total volume of one kind of economic activity — the kind that involves the transfer of money and does not measure the “quality” of that activity. Tell students that there have been several attempts to develop indicators that can give us a “truer” sense of our economic, social and ecological well-being.
- If we want to move toward a vision of a more sustainable community, then what would the indicators be?

Goal: To move toward a sustainable community.

Indicators: *See below.*

- Refer to [“Indicators Packet”](#) (p. 107). Teacher should refer to [“Some Possible Answers to Student Indicators Packet”](#) Teacher Resource (p. 101) for possible prompts to help students answer the questions.
- Tell students that there have been several attempts to develop indicators that can give us a “truer” sense of our economic, social and ecological well-being.
- In small groups, students examine and discuss some new and respected indicators of well-being and progress, marking the texts to identify the focus and purpose of the indicators.
- Individually, students respond to the following questions:
 1. If you wanted to know which countries were doing the least damage to our global commons, what indicator(s) could help you answer the question?
 2. If you wanted to know which country uses the most of the world’s resources, which indicator(s) could help you answer the question?
 3. If you wanted to know overall how humans were impacting the planet, which indicator(s) could help you answer the question?
- Teacher leads class in a discussion of what makes a good indicator. Refer students to [“Vision Indicator Worksheet”](#) (p. 104) and discuss the given example, and have them list other things they may want to measure and what possible indicators could be used to measure them.
 - Record answers on the blackboard, blank overhead or chart paper. In addition to what the group generates, here are some other examples you may want to add:

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- *Measures progress toward sustainability*
- *Understandable to the community*
- *Has a long-term view*
- *Reliable*
- *Accurate*
- *Really tells you what you want to know*
- Students can use this list as a checklist to assess indicators that they, and others, generate.

Tell students that they are all going to begin exploring some new ways of answering the question:

“How can I know if my community is helping to maintain my health, my family’s health, my friends’ health, my community’s health, the health of society and the planet?”

- To answer this question, you have to be able to measure how well your community is accomplishing these goals. To do this, you can use a variety of indicators of your success.
 - **Goal:** To have a healthy community.
 - **Indicators:** What would the indicators be?
- Of course, indicators need not be quantifiable. Other forms of data are also valid (ordinal, qualitative). It is also worth repeating that indicators help us to know if we are moving toward our goals. Remember, too, that not everything worth doing is measurable.
- Traditionally, indicators of success have focused exclusively on a community’s financials or economic information.
- Ask students to consider this broader-scale question: If we wanted to move toward our shared class vision, then what would the indicators be?
 - Use “[Vision Indicator Worksheet](#)” Student Handout (p. 104) to draft indicators that correspond to the class vision
 - Students use Indicator Checklist (see #13) to assess and revise indicators
 - Indicators for the class vision are posted in the visioning area

Teacher Resource
Indicators Packet

Some Possible Answers to Student Indicators Packet

THE GENUINE PROGRESS INDICATOR

Questions:

1. What information do the GDP and the GPI use in common?

They both measure progress, and they both measure the health of the economy.

2. What factors does the GPI take into account that differ from the GDP?

The GPI accounts for social and environmental factors such as natural resources, pollution and degradation of the environment. It also takes into account social realities that subtract from the quality of life in the United States. Finally, the GPI accounts for positive contributions to United States citizens and communities such as volunteer work and raising kids.

3. Which of these would provide better indicators of the progress of a community? Why?

The GPI because it measure all aspects of a community's progress including environmental, social and economic factors.

THE GENUINE PROGRESS INDICATOR (CONTINUED) CHART

Questions:

1. What trend is apparent in the GDP from 1950 to 1995?

It maintains a steady rise from 1950 to 1995.

2. What trend is apparent in the GPI from 1950 to 1995?

It maintains a steady decline that mirrors the GDP from 1950 to 1995.

3. What generalizations can you make about the relationship between the Gross Domestic Product and the overall health of the community?

That the Gross Domestic Product might not measure everything, and that the general health of the United States economy and progress is not as high as it may appear.

Teacher Resource
Indicators Packet (continued)

THE INDEX OF SUSTAINABLE ECONOMIC WELFARE (ISEW)

Questions:

1. What does the ISEW show?

The ISEW shows that the overall progress of a society or community is decreased by social and environmental inequities.

2. What factors account for the difference between the GDP and the ISEW?

The ISEW accounts for factors such as income equality distribution, degradation of the environment and underrating the contributions of housework and child rearing than the GDP.

3. What trend do you notice in the relationship between the GDP and the ISEW?

The GDP and the ISEW closely mirror each other, except that the ISEW illustrates less progress and community success than the GDP does.

4. What does this trend tell you?

This trend illustrates that there is a disparity between what is currently measured as “good” progress for countries (e.g., the GDP), and the disparity between how economic success and progress are measured by the two different indicators.

HUMAN WELL-BEING INDEX (HWI)

Questions:

1. What does the HWI try to measure?

The HWI measures well-being, or the quality of life and resources.

2. What specific areas does the HWI take into account?

The HWI takes into account the specific areas of knowledge, education and human rights.

3. How is this different from other measures you’ve examined?

This measurement is different because it measures aspects of a community that are invisible or not usually thought of as contributions (the commons).

Teacher Resource
Indicators Packet (continued)

THE UNITED NATIONS HUMAN DEVELOPMENT INDEX (HDI)

Questions:

1. What is the purpose of the HDI?

The purpose of the HDI is to illustrate indicators that aren't easily quantifiable.

2. What three basic dimensions does the HDI take into account?

The HDI takes into account longevity (life expectancy), a decent standard of living, and knowledge (education, adult literacy rate, school enrollment rates, etc.)

The Ecological Footprint

1. In what ways is the ecological footprint an indicator? What does it measure?

The ecological footprint is an indicator because it illustrates the impact that humans are having on environmental resources. The footprint measures what we consume of nature. It shows how much productive land and water we require to produce all the resources we consume and to take in all the waste we make.

2. How can a community use the information from its member's ecological footprints?

Once a community has completed its ecological footprint, it can determine how many resources it uses. A community can also use the footprint to understand what direction they need to take in order to reduce their footprint.

3. What are some actions a community might take to respond to its ecological footprint?

A community can improve its transportation system, buy more local goods and products to reduce transportation fuels, etc. A community can also assess what it is using in excess and reduce its consumption to meeting their needs.

EXAMPLES OF ADDITIONAL INDICATORS

Questions

1. How are these indicators organized?

The indicators are organized by the progress they measure in communities: health, education, culture, etc.