



What is Sustainability?

Overview

In this activity, students will learn about the three components of sustainability and will evaluate the sustainability of an activity such as driving to school. In addition, students will be asked to consider how an unsustainable activity can be altered to become more sustainable. This activity was adapted from *Facing the Future: People and the Planet*, 2006 (www.facingthefuture.org/Members/documents/6.Is.it.Sustainable.pdf)

Alignment to North Carolina Essential Standards for Biology

Bio.2.2: Understand the impact of human activities on the environment (one generation affects the next).

Alignment to North Carolina Essential Standards for Earth/Environmental Science

EEn.2.8: Evaluate human behaviors in terms of how likely they are to ensure the ability to live sustainably on Earth.

Essential Questions

- What is sustainability?
- How is the sustainability of an activity determined?
- How can an unsustainable activity be altered to become more sustainable?

Materials

- *Is it Sustainable?* activity from *Facing the Future: People and the Planet*, 2006, provided for teacher reference
- *Is it Sustainable?* Student Worksheet, one copy for each student, provided
- Sustainability Venn diagram, provided
- Chart of activities for Think-Pair-Share #2, provided
- Small pink and green post-it notes (or you may use red and green markers)
- Tape

Teacher Preparation

You may want to review the original lesson, *Is it Sustainable?*, from which this activity has been adapted for additional details.

Student Preparation

This activity could be preceded by a discussion of “carbon footprints” and how carbon dioxide emissions reduction strategies can benefit the environment, the economy, and society and thus would be considered sustainable.

Duration

30 minutes

Procedure

1. Either individually or in partners, have students brainstorm to define the term **sustainability**. Invite students to share their answers aloud, while you write their responses on the board or overhead.
2. Present students with a definition for sustainability: meeting the needs of the present generation without compromising the ability of future generations to meet their needs. You may want to discuss what the term “needs” refers to: access to clean air and water, food, shelter, etc.
3. Present students with a Venn diagram depicting the three components of sustainability: the economy, the environment, and society. You may need to define these terms before proceeding. Explain that when evaluating the sustainability of an activity/product/service, the positive and negative aspects (including unintended consequences) of this activity on all three of these areas are considered. The Venn diagram can be used to illustrate that there can be an overlap between these components.

4. Inform students that some activities are more sustainable than others and thus, every activity can be placed somewhere on a sustainability scale:



5. To help students gain experience in evaluating the sustainability of an activity, the class will evaluate one activity together – driving to school. Handout the attached worksheet, *Is it Sustainable?* and tell students to complete Think-Pair-Share #1 with their partner.
6. As students consider the question “Is driving to school a sustainable activity?”, encourage them to consider the impact of driving to school on the environment, the economy, and society by answering the following questions:

Environment

- What resources are used?
- Are the resources used able to be renewed or regenerated?
- Are plants and/or animals damaged?
- Is biodiversity maintained?
- Does the activity cause air pollution, water pollution, or soil erosion?
- Does the activity generate waste?
- What happens to the waste?
- Will this activity help to conserve natural resources (air, water, land)?

Economy

- What is the economic impact of this activity?
- Does the activity create meaningful and satisfying work for individuals?
- Does the activity allow people to do their jobs more efficiently?
- Does the activity contribute to a community’s economic development?
- Does the activity rely on products or services that have negative effects on the environment or society?

Society

- Does the activity contribute to people’s quality of life?
- Do some people benefit from this activity at the expense of others?
- Does the activity affect people’s cultures?
- Are individuals and communities involved in making decisions about the activity?
- Does the activity offer more options/opportunities to certain groups of people than others?

7. Project the Venn diagram at the front of the room and ask students to tell some positive and negative impacts that they came up with – write these impacts down with either a green (positive) or red (negative) marker on the appropriate area in the Venn diagram. Remember that some impacts may fall within more than one category and should be placed in the overlap regions on the Venn diagram. By looking at the number and location of green (positive) impacts, the class should be able to come to a consensus about whether the activity is economically, environmentally, and/or socially sustainable. You can also discuss how some unsustainable aspects of driving to school can be made more sustainable (e.g. using biofuel instead of diesel).
8. Students will now repeat this activity by evaluating another activity of their choice as they complete Think-Pair-Share #2. Working with their partner, students will evaluate an activity within ONE of these categories: Individual Activities, School Activities, Government Actions, and Business Products/Services. Note: You may wish to provide students with a list of activities within each category to ensure that a variety of activities are evaluated by the class. Instruct students to pick one activity from the list you provide and to use the same questions that guided their decision-making process during *Think-Pair-Share #1* to determine whether the sustainability of this activity.
9. For each positive/negative impact that students come up with, ask them to write that impact down on either a green (positive) or pink (negative) post-it note. Instruct them to place each post-it note on the appropriate area in the Venn diagram provided on the back of their worksheet. Remind them that some impacts may fall within more than one category and should be placed in the overlap regions on the Venn diagram. By looking at the number and location of green (positive) post-it notes, students will be able to determine whether the activity is economically, environmentally, and/or socially sustainable.
10. Once students have had some time to evaluate their activity, direct them to determine where their activity should be placed on the sustainability scale. Ask them to bring their Venn diagram with the post-it notes attached to the front of

the room and place it at this position on the scale provided at the front of the classroom so that they can see their activity compares to others. Alternatively, you may ask students to present their completed Venn Diagrams to their classmates as they place it on the sustainability scale. It is also interesting to see where groups evaluating the same activity place their Venn diagram.

11. Go over the various activities and the placement of their corresponding Venn diagrams as a class. You may address the following questions to the class:
 - How did you decide where to place your activity on the sustainability scale?
 - Did one category (e.g. economy) outweigh the others as you made your decision?
 - Do you agree with the placement of the various activities on the sustainability scale?
 - How can an unsustainable feature of an activity be adjusted to become more sustainable (e.g. using solar panels to power lights at a football field instead of electricity)?

Extension

Once students have gained experience evaluating the sustainability of an activity, present students with a scenario that requires them to critically evaluate the sustainability of two related activities and make an informed decision about which one is more sustainable, if possible. Scenarios you may wish to provide include:

- Recycling a bottle versus throwing it into the trash
- Drinking bottled water versus drinking tap water
- Using cloth diapers versus disposable diapers
- Using paper versus plastic shopping bags
- Replacing a working washing machine now with an Energy Star model versus waiting until the current washing machine breaks to replace it with an Energy Star model
- Buying a fuel efficient car versus buying a hybrid vehicle
- Eating foods grown locally versus eating fast food from a restaurant chain

Culminating Activities

- Ask students to discuss or write about how they can incorporate more sustainable practices into their daily life.
- Invite someone who works in the field of sustainable development to speak to the class.

Differentiation

Students with Special Needs

- Place students in mixed ability partners for activity completion.
- Think-Pair-Share Activity #2 could be completed as an entire class; project the Venn diagram at the front of the room and have students post positive and negative attributes of the activity onto the diagram.

AIG

- Students can work individually and assess the sustainability of an activity of their choice.
- Ask students to summarize their evaluation in writing.
- Ask students to evaluate the sustainability of a local activity making headlines such as the opening of a new school or business, or a community festival or event.

Resources

EPA's Sustainability Home Page

<http://www.epa.gov/sustainability/index.htm>

Activities to Evaluate during Think-Pair-Share #2

Individual activities <ul style="list-style-type: none">-Owning/using a cell phone-Driving above the speed limit-Eating at McDonald's for breakfast-Drinking bottled water at lunch-Shopping at the Saturday farmer's market	School activities <ul style="list-style-type: none">- Hosting a Friday night high school football game- Going on a class field trip to the zoo- Buying recycled paper for copiers- Selling soft drinks in vending machines- Allowing students to drive off-campus for lunch
Government actions <ul style="list-style-type: none">- Offering curbside trash pick-up- Raising the fee to ride public transportation- Building an energy efficient courthouse- Building sidewalks to the local high school from neighboring suburbs	Business products/services <ul style="list-style-type: none">- Making computers- Producing organic cotton T-shirts- Building a 5,000 sq ft. house in the suburbs- Building a restaurant on a vacant lot- Home delivery of a daily newspaper- Raising pasture-fed beef to sell to consumers

Is it Sustainable?

Adapted from *Is it Sustainable? In Facing the Future: People and the Planet*, 2006.
www.facingthefuture.org/Members/documents/6.Is.it.Sustainable.pdf

Think-Pair-Share #1

With a partner, discuss the question: Is driving to school a sustainable activity?

You'll need to be able to explain your decision to the class.

As you consider this question, think about the impact of driving to school on the environment, the economy, and society:

Environment

- What resources are used?
- Are the resources used able to be renewed or regenerated?
- Are plants and/or animals damaged?
- Is biodiversity maintained?
- Does the activity cause air pollution, water pollution, or soil erosion?
- Does the activity generate waste?
- What happens to the waste?
- Will this activity help to conserve natural resources (air, water, land)?

Economy

- What is the economic impact of this activity?
- Does the activity create meaningful and satisfying work for individuals?
- Does the activity allow people to do their jobs more efficiently?
- Does the activity contribute to a community's economic development?
- Does the activity rely on products or services that have negative effects on the environment or society?

Society

- Does the activity contribute to people's quality of life?
- Do some people benefit from this activity at the expense of others?
- Does the activity affect people's cultures?
- Are individuals and communities involved in making decisions about the activity?
- Does the activity offer more options/opportunities to certain groups of people than others?

Student Worksheet

NAME: _____

Think-Pair-Share #2

1. With a partner, pick ONE of these categories and circle it:

Individual Activities
School Activities
Government Actions
Business Products/Services

2. Next, pick one activity from the chart provided by your teacher and use the same questions that guided your decision-making process during *Think-Pair-Share #1* to determine whether this is a sustainable activity.

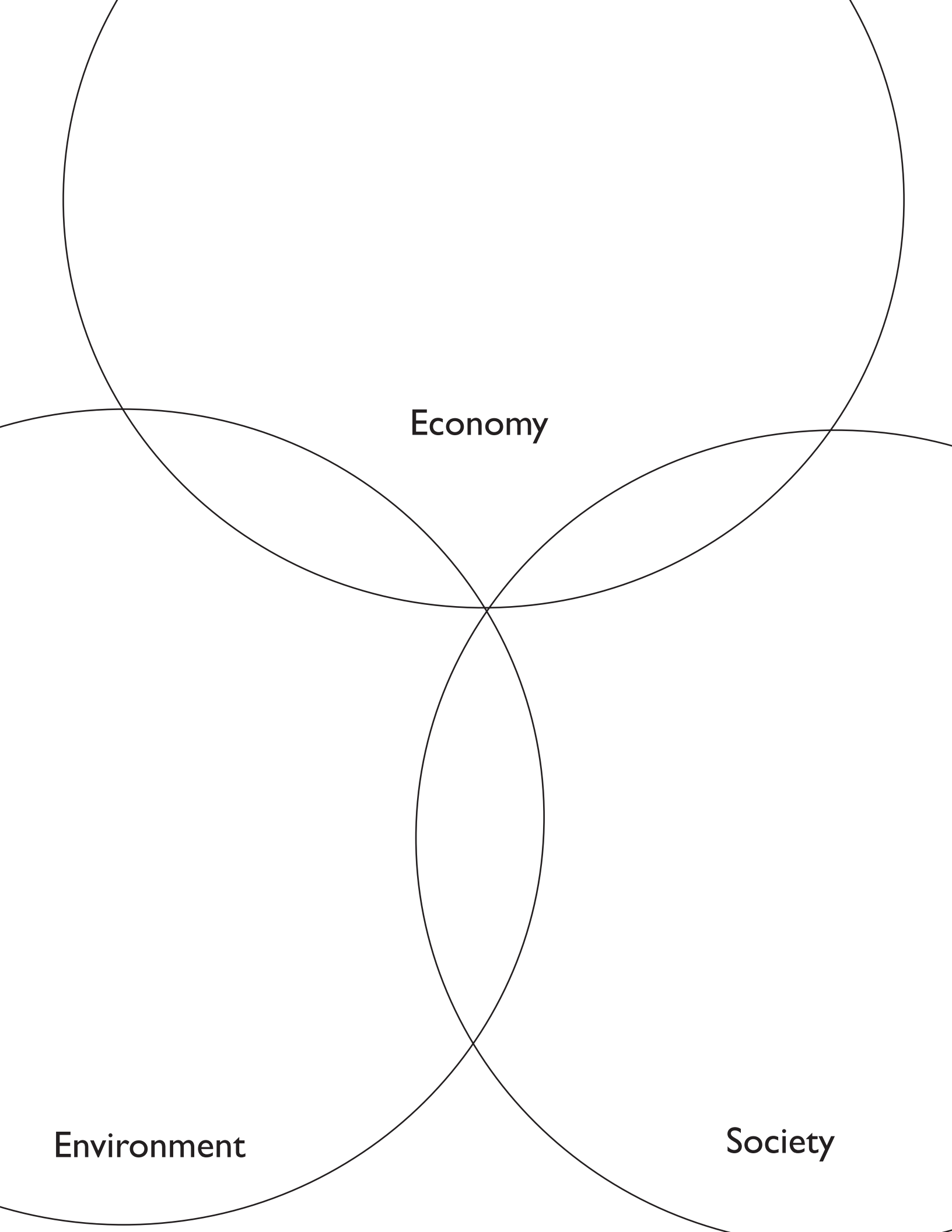
List the activity you will evaluate here:

3. For each positive/negative impact that you come up with – write that impact down on either a green (positive) or pink (negative) post-it note. Next, place each post-it note on the appropriate area in the Venn diagram provided on the back of this sheet. Remember that some impacts may fall within more than one category and should be placed in the overlap regions on the Venn diagram.

4. By looking at the number and location of green (positive) post-it notes, you will be able to determine whether the activity is economically, environmentally, and/or socially sustainable. You'll need to be able to explain your decision(s) to the class and show your completed Venn diagram.

5. Decide where your activity should be placed on the sustainability scale below– draw an X indicating its position on the scale. Next, take your Venn diagram with the post-it notes attached and, using tape, place it at this position on the scale provided at the front of the classroom so that you can see how your activity compares to others.





Economy

Environment

Society

Is It Sustainable?

OVERVIEW

Students define and discuss sustainability and its 3 key components: the economy, the environment, and society. Students brainstorm, analyze, and write about the sustainability of a variety of actions taken by individuals, businesses, and governments, using a Venn diagram to help organize the process.

INQUIRY/CRITICAL THINKING QUESTIONS

- What does “sustainability” mean and how does it apply to human activity?
- How is the sustainability of an individual, business, or government activity determined?
- How can we balance the needs of people, protect the environment, and have a vibrant and equitable economy?
- How can an activity be made more sustainable?

OBJECTIVES

Students will:

- Define sustainability and its 3 key components: the economy, the environment, and society
- Identify and describe a range of activities undertaken by individuals, businesses, and governments (e.g. foods they eat, transportation they use, products they buy, services provided, laws passed, etc.)
- Determine the sustainability of these activities based on a set of criteria that includes impacts on the economy, the environment, and society
- Represent their findings using a Venn diagram
- Analyze if and how an unsustainable activity can be altered to adhere to the 3 components of sustainability

TIME REQUIRED: 1 hour

KEY ISSUES/CONCEPTS

- **Sustainability**
- **Three components of sustainability: economy, environment, and society**

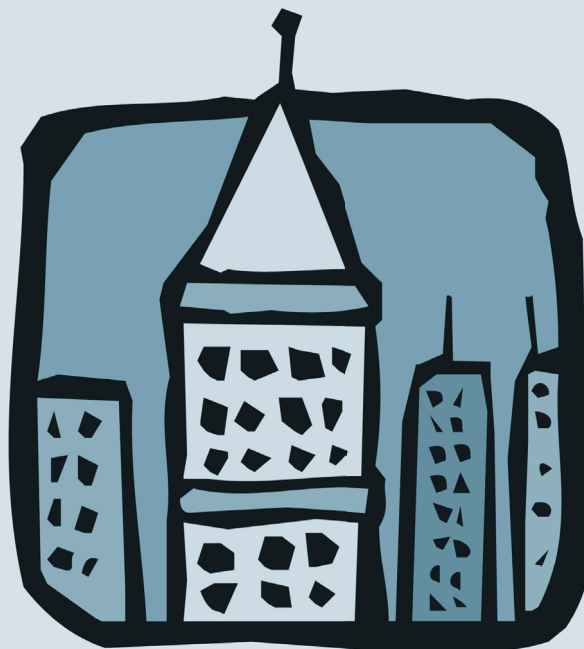
SUBJECT AREAS

- **Social Studies**
(World History, World Cultures, Geography, Economics, Global Studies)
- **Science** (Life, Environmental)

NATIONAL STANDARDS CONSISTENCY

- **NCSS: 1, 3, 4, 5, 6, 7, 8, 9**
- **NSES: B, C, E, F**

GRADE LEVEL: 7–12



Is It Sustainable?

FTF Related Reading

- Intermediate: Chapter 1 from *Global Issues and Sustainable Solutions*
- Advanced: Unit 1, Chapter 2 from *It's All Connected*

Materials/Preparation

- Overhead: *Components of Sustainability*
- 3 different colored sticky notes, 2"x2", enough for each student to have 1 sticky note of each color
- Draw a Venn diagram (like the one in the *Components of Sustainability* overhead) on a large sheet of butcher paper (or project the overhead onto a whiteboard)

Activity

Introduction

1. Ask the class what they think sustainability means. Have them first think quietly for a minute. Then have them pair up with a partner and discuss what they think sustainability means. Have them share their answers with the class. As they share, write down their ideas on the board or overhead. Ideally they will construct a definition that is close to this: Sustainability means meeting present needs without compromising the ability of future generations to meet their own needs. The meaning of this might be explored further, with "needs" or "needs of the present" defined more clearly by students. Have them brainstorm some needs and then discuss the potential conflicts that inevitably arise between needs (e.g. having affordable clothing versus livable wages for workers, or

- having clean air versus using a car as transportation).
2. Define the 3 components of sustainability using the overhead *Components of Sustainability*. Explain that in determining whether an action or product/good/service is sustainable, many people who study sustainability take into account 3 key elements: the environment, the economy, and society/equity. In order to determine whether or not something is sustainable, the activity being evaluated would be assessed in relation to each of these principles, or "standards of sustainability". This assessment reveals how the action or item impacts the economy, the environment, and society, in either negative, positive, or neutral ways. You may need to define economy, environment, and society. Do this using the same think, pair, share method used to define sustainability.
3. Using the Venn diagram (on the butcher paper or projected on the whiteboard) explain that its purpose is to demonstrate that issues overlap and share common traits.

Steps

1. Explain that they will list and analyze the sustainability of several different activities, products, and actions from the categories of: individual activities (e.g. eating breakfast, driving to school, attending school, and playing guitar), specific business products or services (e.g. clothes, housing, computers, restaurants) and specific government actions (e.g. passing laws and

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regulations, provision of services such as utilities, trash, etc.).

2. Before breaking them into groups, choose 1 activity (such as driving to school) and walk through an analysis of the activity with the whole class, asking if it is sustainable using the 3 “components of sustainability” (Economics, Environment, and Society) as a guide. Questions to ask about the activity include:

Sustainability:

- Is the activity sustainable today?
- Can it be done without causing damage in the 3 areas (economics, environment, and society?)
- Can this activity be done so that people in the future will have the same opportunities to do this activity as people today?

Environment:

- How many resources does the activity use?
- Does the activity cause damage to plants or animals?
- Is biodiversity protected?
- Does it cause air pollution, water pollution, or soil erosion?
- Does it use resources at a rate that allows the resource to be renewed or regenerated?
- What happens to the waste created by the activity?
- Does the activity generate excessive waste?

Society:

- Does it contribute to people’s quality of life?
- How does it affect culture(s)?
- Are individuals and communities involved in making decisions about the activity, and is the decision-making

process fair and democratic?

- Is it an equitable activity; does it offer more options and opportunities to certain groups of people than others?

Economy:

- What is the economic impact of the activity?
- Does it create meaningful and satisfying work for individuals?
- Does it contribute to a community’s economic development?
- Does the activity rely on products or services that have negative effects on the environment or society?
- Do some people benefit economically from this activity at the expense of others?
- Will this activity contribute to the conservation of natural resources?

3. Arrange students in groups of 3 and assign each group 1 category: individual activities, business products and services, or government actions.
4. Have them create a brainstorm list of activities that fall within their assigned category.
5. From their brainstorm list, have students choose 2 activities from their list and transfer these to individual color-coded sticky notes (use different color sticky notes for each category, such as blue for individual activities, yellow for business activities, and green for government activities).
6. Have students place their sticky notes on the Venn Diagram in the area they think the activity best fits, depending on whether the activity is economically, environmentally, and/or socially sustainable.

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7. Have each group explain to the class how they decided on the placement, giving concrete examples and evidence to support their decision. Encourage each member of the group to participate in the discussion and, if time permits, answer questions from the class.
8. Conclude with the following reflection questions.

Assessment Reflection Questions

For Intermediate and Advanced Students

- If someone asked you what sustainability meant, how would you respond?
- Explain whether it is easy or hard to decide whether an activity is sustainable.
- Can everything we do be measured against the standards of sustainability? What are some examples of activities that would be especially difficult to measure and especially easy to measure?
- Can something that is unsustainable be altered to become more sustainable?
- Choose an unsustainable activity from the Venn Diagram and explain how it could be made more sustainable.

For Advanced Students

- Why do you think people use the standards of sustainability to assess



- human activities? How and where could this process be useful?
- If you were a business owner or a government decision-maker, what would you think about sustainability?
 - Ask whose needs should be met when there are trade-offs involved (e.g. between economic and environmental priorities) and how these contradictions can be resolved. This discussion will underscore the idea that working toward sustainability is a balancing act that requires long-term creative thinking and the ability to compromise and see through the eyes of others. Issues of choice and responsibility are also highlighted – students will learn that they have the ability to make choices that bring about positive change, and understand that their choices (e.g. whether or not to eat fast food or buy a brand of clothing that is manufactured in sweatshops) have concrete economic, environmental, and social impacts, even if these impacts are out of sight and felt far away.
 - Discuss the difference between “economic development” and “economic growth” and the relationship between economic growth and consumption. What is the role of economic growth in fostering sustainable development?

Is It Sustainable?

Does economic development help nations focus more on conserving their resources or does it contribute to over-consumption? In some cases, economic development includes commitments to eradicating poverty and changing unsustainable patterns of consumption.

Technology Connection

- Compare the levels of sustainability of different nations by downloading the International Institute for Sustainable Development's "Dashboard of Sustainability." The Dashboard is a unique on-line tool that uses a vehicle's instrument panel to represent country-specific assessments of economic, environmental, social, and institutional performance toward (or away from) sustainability. Download at http://www.iisd.org/cgsdi/intro_dashboard.htm.

Action Projects

- Visit www.facingthefuture.org, click on **Take Action**, and then **Fast Facts Quick Actions** for sustainability information and action opportunities.
- Have your students take the **Facing the Future Pledge** to help create a sustainable world. Pledge form is on page 22 or can be downloaded at www.facingthefuture.org. Post the pledges in the classroom and have students track and then report later in the year how they are doing on their pledge.

Additional Resources

Films

- *Ecological Design: Inventing the Future*, Brian Danitz and Chris Zelov, 1994, 60

minutes. What do flying bicycles, Rocky Mountain jungles, "living machines", and recyclable homes with their own "metabolism" all have in common? They are unique, inexpensive solutions to the design dilemma of sustainable living and are all featured in this film.

- *Visions of Utopia: Experiments in Sustainable Culture*, Geoph Kozeny, 2002, 94 minutes. This documentary looks at different ways people are bringing more community into their lives and their work.
- *Ancient Futures: Learning from Ladakh*, The International Society for Ecology & Culture, 1993, 59 minutes. www.isec.org.uk A documentary video on the changes that Western development brought to the high mountain city of Ladakh in northern India. Ladakh, a culture of Tibetan Buddhism and sustainable agricultural practices, struggled with the coming of television, drugs, consumerism, and industry.

Websites

- www.iisd.org - The International Institute for Sustainable Development (IISD) engages decision-makers in government, business, NGOs and other sectors to advance policies that are beneficial to the global economy, environment, and social well-being.
- www.naturalstep.org - A non-profit international organization working to build an ecologically and economically sustainable society through education, scientific research, and services for business and government.

Lesson 6 Overhead: *Components of Sustainability*

